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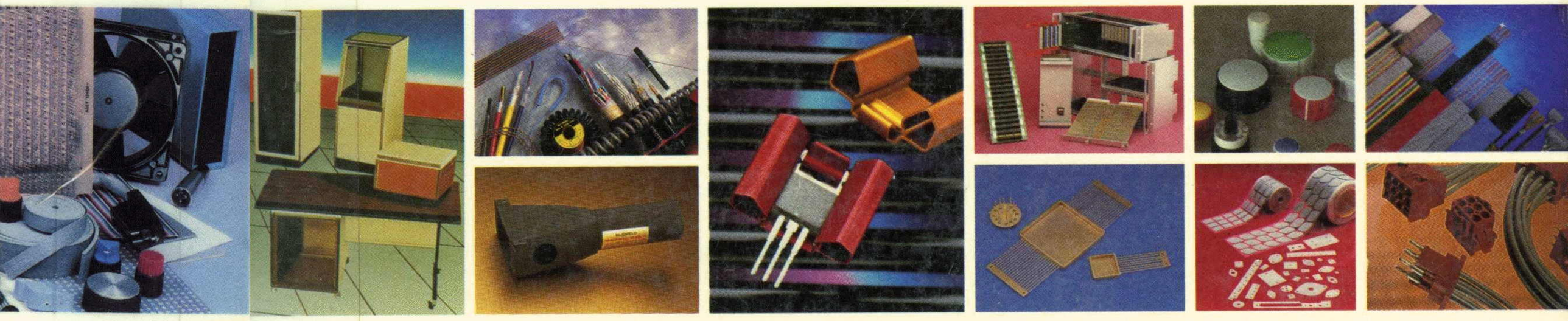

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trademark and logofinder directories

A comprehensive trademark directory is included at the end of the EEM yellow pages in Volume **C**.The EEM logofinder shows the symbols and graphics used by manufacturers as identifiers on their products. Use these pages to locate manufacturers of specific trademarks and logos.

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manufacturers' index

In the EEM yellow pages you will find pertinent details on all manufacturers listed in EEM including local sales offices and/or distributors. Please refer to the detailed instructions on the first page of the EEM yellow pages for additional information.

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The EEM File System is revised and updated to reflect changes in EEM itself. Each new EEM File System contains a complete Product Index. This index tells you where to file which catalog. It also contains a cross reference identifying what should be filed in each section. In order to use the EEM File System all you need is a supply of standard letter size, third-cut manila file folders. You then use the pressure sensitive labels which are supplied with the system to go into as much detail as you want or need.

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DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218

† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
§ EG & G Wakefield Engineering, Wakefield, MA 01880 617-245-5900
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000
† Epoxy Technology, Inc., Billerica, MA 01821 ..... 508-667-3805;800-227-2201
§ FENWAL INC., Ashland, MA 01721 508-881-2000
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
International Mircoelectronics, Arlington, TX 76003 817-561-2244
Leepoxy Plastics, Inc., Ft. Wayne, IN 46809 219-747-7411
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Master Bond, Hackensack, NJ 07601 201-343-8983
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Mouser Electronics, Mansfield, TX 76063 800-346-6873
Omega Engineering, Stamford, CT 06907 800-826-6342
† Orcus, Kansas City, MO 64112 913-897-5128
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
Sheldahl, Inc., Northfield, MN 55057 507-663-8000
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
§ Thermalloy, Inc., Dallas, TX 75381-0839 214-243-4321
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550

Adhesives, General Purpose-1600

† Ablestik Laboratories, Gardena, CA 90248 213-532-9341
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
Ambroid Co., Lynnfield, MA 01940 617-246-1180
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
§† Berg, W. M., inc., East Rockaway, NY 11518 516-599-5010
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
ChemRex Inc., ResTech Prods. Div., Commerce City, CO 80022 303-289-5651
Conap, Inc., Olean, NY 14760 716-372-9650
Contact East, N. Andover, MA 01845 508-682-2000
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
† DOW SWITCH, Wilmington, MA 01887 617-935-6395
§† Epoxylite Corp., Irvine, CA 92713 714-951-3231
† Epoxy Technology, Inc., Billerica, MA 01821 ..... 508-667-3805;800-227-2201
§ FENWAL INC., Ashland, MA 01721 508-881-2000
Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§† GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
† Hardman Inc., Belleville, NJ 07109 201-751-3000
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
Leepoxy Plastics, Inc., Ft. Wayne, IN 46809 219-747-7411
† Master Bond, Hackensack, NJ 07601 201-343-8983
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Metron Optics Inc., Solana Beach, CA 92075-0690 619-755-4477
† Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
Omega Engineering, Stamford, CT 06907 800-826-6342
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Sigma Plastronics, Inc., Whitmore Lake, MI 48189 313-231-2871
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

Adhesives, Insulating-1600

† Ablestik Laboratories, Gardena, CA 90248 213-532-9341
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
† Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
ChemRex Inc., ResTech Prods. Div., Commerce City, CO 80022 303-289-5651
† Contact East, N. Andover, MA 01845 508-682-2000
† Cotronics, Brooklyn, NY 11235 718-646-7996
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
DuPont de Nemours, E. I, & Co., Wilmington, DE 19898 302-773-3218
§ Epoxylite Corp., Irvine, CA 92713 714-951-3231
† Epoxy Technology, Inc., Billerica, MA 01821 ..... 508-667-3805;800-227-2201
§ FENWAL INC., Ashland, MA 01721 508-881-2000
Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
Lancer Chemical, Warren, RI 02885 401-245-5493
Leepoxy Plastics, Inc., Ft. Wayne, IN 46809 219-747-7411
† Master Bond, Hackensack, NJ 07601 201-343-8983
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
Omega Engineering, Stamford, CT 06907 800-826-6342
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Rogers Corporation, Circuit Materials Div., Chandler, AZ 85244 602-963-4584
† Sigma Plastronics, Inc., Whitmore Lake, MI 48189 313-231-2871
Soundcoat Co., Inc., Deer Park, NY 11729-5701 516-242-2200
§ Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Thermalloy, Inc., Dallas, TX 75381-0839 214-243-4321
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501

Adhesives, Liquid Spray-1600

† Conap, Inc., Olean, NY 14760 716-372-9650
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
† Master Bond, Hackensack, NJ 07601 201-343-8983
Soundcoat Co., Inc., Deer Park, NY 11729-5701 516-242-2200

Adhesives, Optical-1600

† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
Contact East, N. Andover, MA 01845 508-682-2000
† Epoxy Technology, Inc., Billerica, MA 01821 ..... 508-667-3805;800-227-2201
Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
† Hardman Inc., Belleville, NJ 07109 201-751-3000
† Master Bond, Hackensack, NJ 07601 201-343-8983
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
Rolyn Optics Co., Covina, CA 91722-2199 ..... 818-915-5707/5717
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501

Adhesives, UV Curing-1600

Contact East, N. Andover, MA 01845 508-682-2000
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
† Master Bond, Hackensack, NJ 07601 201-343-8983
Xenon Corp., Woburn, MA 01801 617-938-3594

Adhesives, Wire Tacking-1600

Ambroid Co., Lynnfield, MA 01940 617-246-1180
† Contact East, N. Andover, MA 01845 508-682-2000
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
Leepoxy Plastics, Inc., Ft. Wayne, IN 46809 219-747-7411
† Master Bond, Hackensack, NJ 07601 201-343-8983
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
§ Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
Xenon Corp., Woburn, MA 01801 617-938-3594

Air Cleaners & Filters (Shielded & Unshielded)-2600

ETRI, Inc., Monroe, NC 28110, 704-289-5423 ..... C•1658
Indek Corporation, San Jose, CA 95131, 408-432-1199 ..... C•1668
Rittal Corp., Springfield, OH 45504, 800-637-4425 ..... C•1086
Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ..... C•1748
† Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
† Air Maze Corp., Cleveland, OH 44128 216-292-6800
† Aluminum Filter, Carpinteria, CA 93013 805-684-7651
† Baker Co., Inc., Sanford, ME 04073 1-800-992-2537
† Balston, Lexington, MA 02173 617-861-7240
Bosch, Robert, Corp., Broadview, IL 60153 312-865-5200
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
§ Cambridge Filter Corp., Syracuse, NY 13221-4906 315-457-1000
† Carey Electronics Engineering Co., Springfield, OH 45505 513-323-6300
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ Clean Room Prods., Ronkonkoma, NY 11779-6528 516-588-7000
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
§ Heath Co., St. Joseph, MI 49085 616-982-3200
§ Heat System, Inc., Farmingdale, NY 11735 516-694-9555
§ Hobson Bros., Chicago, IL 60630-3884 312-283-3600
Marlow Industries, Inc., Dallas, TX 75238-1645 214-340-4900
McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550 .. 609-799-0100
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
Norgren, Littleton, CO 80120-1663 303-794-2611
§ Qualtek Electronics Corp., Mentor, OH 44060 216-951-3300
§ Snaptite/Allied, Erie, PA 16505 814-833-6131
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
Tegal Scientific, Inc., Concord, CA 94524 415-827-1054

Air Conditioners (For Equipment)-2600

Cambridge Aeroflo, Inc., Shirley, MA 01464, 508-45-2346 ..... C•1641
§ ebm Industries, Inc., Farmington, CT 06032, 203-674-1515 ..... C•1648-1649
† Electro Impulse, Red Bank, NJ 07701-0870, 201-741-0404 ..... C•1652-1653
Marlow Industries, Inc., Dallas, TX 75238-1645, 214-340-4900 ..... C•1672-1673
† McLean Midwest, Sub. of Zero Corporation, Brooklyn Pk., MN 55443, 612-561-9400 ..... C•1676-1677
Rittal Corp., Springfield, OH 45504, 800-637-4425 ..... C•1086
TECA, ThermoElectric Cooling America Corp., Chicago, IL 60622, 312-666-1600 ..... C•1690-1691
Energy Systems, Woodland Hills, CA 91367 818-716-9004
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
† Kooltronic, Inc., Hopewell, NJ 08525 609-466-3400
† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
† Noren Products Inc., Menlo Pk., CA 94025 415-322-9500
§ Norgren, Littleton, CO 80120-1663 303-794-2611
Rush Enterprises Inc.:A Heico Company, Hudson, NH 03051 603-886-9460
† Sinclair Radio Laboratories Ltd., Aurora, ONT., CANADA L4G 3G9 416-727-0165
Standard Environmental Systems, Inc., Totowa, NJ 07512 201-256-2200
† Thermacore Inc., Lancaster, PA 17601 717-569-6551

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Alloys, Brazing-5400
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
† Fusion Inc., Willoughby, OH 44094 216-946-3300
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
† Transmet Corp., Columbus, OH 43228 ..... 614-276-5522;800-245-5253
Tricon Industries, Inc., Brazing Alloys & Chemical Products Div., Downers Grove, IL 60515-4012 312-963-0220
† Wilkinson, Westlake Village, CA 91359 ..... 818-889-0050;800-822-4653

Alloys, Metal/Ceramic-1600
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. C•1619, D•2241
† Alpha Metals, Jersey City, NJ 07305 201-434-6778
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
§† Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
† Magnetics, Spang & Co., Butler, PA 16003-0391 412-282-8282
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
§† NGK Berylco, NGK Metals Corporation, Reading, PA 19612-3367 215-921-5000

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Antennas, Helical-1900 — *See Vol. D*
Antennas, Log Periodic-1900 — *See Vol. D*
Antennas, Loop-1900 — *See Vol. D*
Antennas, Microwave-1900 — *See Vol. D*
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Antennas, Phased Array-1900 — *See Vol. D*
Antennas, Rhombic-1900 — *See Vol. D*
Antennas, Satellite-1900 — *See Vol. D*
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Antennas, Telescopic-1900 — *See Vol. D*
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Attenuators, Logarithmic-3450 — *See Vol. A*
Attenuators, Microwave-3450 — *See Vol. A*
Attenuators, Programmable-3450 — *See Vol. A*
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Awls-5400

Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Vaco Products, Chicago, IL 60645 312-677-9500

Backpanel Interconnect Systems-3200

AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
§† Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1706-1708
Dage Precision Industries, Inc., Fremont, CA 94538, 415-683-3930 ..... C•1710-1711,1724
§† DataCon, Inc., Burlington, MA 01803, 617-273-5800 ..... C•1725
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1340
§ Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1028-1030
Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 .. C•1346-1347
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... C•1037
† E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473 ..... C•1714-1715
§ Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 .... C•1362,1364-1366
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
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§ Scanbe, Unit of Zero Corporation, El Monte, CA 91731, 818-579-2300 ... C•1089
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Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1107,1109
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... C•1110
§ Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1722,1728
† Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1122-1123
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1563,1573-1574

§ **WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136** ..... **C•1563,1573-1574**
ADAC Corp., Woburn, MA 01801 617-935-6668
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Assembly Specialists, Acton, MA 01720 617-263-9100
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
† CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
† Cuplex, Inc., Garland, TX 75040 214-276-0333
§ Data-Design Labs., Cucamonga, CA 91730 714-987-2511
Douglas Electronics, San Leandro, CA 94577 415-483-8770
† Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
† Electronic Modular Systems, Inc., Pasadena Technology Corp., Carrollton, TX 75006 214-446-2900
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
Hybricon Corporation, Ayer, MA 01432 508-772-5422
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
† Kalmus & Assocs., Inc., Broadview, IL 60153 312-343-7004
Lamtech Electronics, Garland, TX 75042 214-272-3504
† Mac Panel Co., High Point, NC 27264 919-884-8111
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 215-699-5373
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Poly Circuits, Inc., Bensenville, IL 60106 312-860-3560
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corp. Div. Power Distbn.Div., Mesa, AZ 85205 602-830-3370
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Unitrack Industries, Inc., West Chester, PA 19380 215-692-0800
Urban Electronics, Dover, MA 02030 617-329-4068

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§† Gems Sensors Division, IMO Delaval Inc., Plainville, CT 0602-1198 203-677-1311

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§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272**
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... **C•1477**
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Basic Electronics, Inc., Stanton, CA 90680 714-530-2400
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ CTS Corporation, Switch Div., Paso Robles, Paso Robles, CA 93446 805-238-0350
† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Rogers Corp., Rogers, CT 06263 203-774-9605
§† Ross Engineering Corp., Campbell, CA 95008 408-377-4621
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... **C•1586**
§† Andrews Bearings, Ina Bearing Company, Inc., Spartanburg, SC 29304 .. 803-583-4541
Bearing Inspection, Santa Fe Springs, CA 90670 213-944-6251
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
† Graphite Metallizing Corp., Yonkers, NY 10702 914-968-8400
International Machine & Tool Corp., Warwick, RI 02888 401-467-6905
Keystone Carbon, Thermistor Div., St. Marys, PA 15857 814-781-1591
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
MPB Corp., Miniature Precision Bearings Div., Keene, NH 03431 603-352-0310
§† New Hampshire Ball Bearings, Inc., NMB (USA), Inc., Peterborough, NH 03458 603-924-3311
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
Polymer Corp., Reading, PA 19605 215-320-6600
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
Rogers Corp., Rogers, CT 06263 203-774-9605
Seattle Aircraft Bearings, Mercer Island, WA 98040 206-232-4800
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Stackpole, Carbon Div., St. Marys, PA 15857 814-781-1234
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
Swiss Jewel Company, Philadelphia, PA 19106 ..... 215-925-2867;800-922-0118
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970

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Belting Industries Co., Inc., Kenilworth, NJ 07033 201-272-8591
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
§† Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
Plastimatic, Inc., Glynwed Int'l, Fairfield, NJ 07006 201-575-0038
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300

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† **Amco Engineering, Schiller Pk., IL 60176, 312-671-6670;800-833-3156** ... **C•1006**
Cabtron Systems, Inc., Northbrook, IL 60062, 312-498-6090 ..... **C•1014**
Electra-Tec, Impert Industries, Inc., Otsego, MI 49078, 800-225-3532;616-694-2058 ..... **C•1026**
Emcor Products, Crenlo, Inc., Rochester, MN 55901, 507-289-3371 ..... **C•1039**
† **Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691** ..... **C•1040,1043,1045-1046**
Everest Electronic Equipment, Lawrenceville, GA 30243, 404-995-8688 .. **C•1053**
§ **Hammond Manufacturing Co., Buffalo, NY 14225, 716-894-5710** ..... **C•1057**

† **Kalamazoo Technical Furniture, Kalamazoo, MI 49005, 616-385-2255;800-832-5227** ..... C•1058
† **Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000** ..... C•1064
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... C•1076
Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1084
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§ **Zero Corp., Burbank, CA 90503, 818-846-4191** ..... C•1122
† Alden Systems, Alden Products Co., Brockton, MA 02403-0860 508-583-0160
Atlas/Soundolier, Fenton, MO 63026 314-349-3110
† Baker Co., Inc., Sanford, ME 04073 1-800-992-2537
Bishop Graphics, Inc., Agoura, CA 91304 818-991-2600
† Clean Room Prods., Ronkonkoma, NY 11779-6528 516-588-7000
Contact East, N. Andover, MA 01845 508-682-2000
† Craig Systems Corp., Hanson Industries, Amesbury, MA 01913-4848 508-388-5662
D. L. Custom, Markham, Ont, CANADA L3R 2M5 416-475-0275
† Electronic Enclosures, Div. Wyle Labs, El Segundo, CA 90245 213-643-8181
† Enclosure Corp., Bristol, PA 19007 215-785-2900
§† Equipto, Aurora, IL 60506 ..... 312-859-1000;800-323-0801
§ Ferno-Salesmaker, Ferno-Washington, Inc., Wilmington, OH 45177 513-382-1451
Forma Scientific, Inc., Marietta, OH 45750 614-373-4763
† General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
§ Hodge Manufacturing Co., Inc., Springfield, MA 01107 413-781-6800
† House of Metal Enclosures, Hermann, MO 65041 314-486-3111
Hudson Industries, Hudson, NH 03051 603-880-7712
Kewaunee Scientific Corp., Technical Workstation Div., Lockhart, TX 78644 512-398-5292
§ LJ Technical Systems, Hauppauge, NY 11788 516-234-2100
§ Lyon Metal Products, Aurora, IL 60507 312-892-8941
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
† Stanley-Vidmar, Stanley Works, Allentown, PA 18103 215-797-6600
Suckle Corp., Scranton, PA 18505 717-346-3871
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

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† **JMJ Technical Prods., Newark, NJ 07105, 201-589-4257** ..... C•1612
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† **Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500** ..... C•1749
§ Alpha Dist. Corp., Richfield, OH 44286 216-659-7100
§ Amerex, Riverside, CA 92516 714-686-1400
§ Arrow Hart Components, Cooper Industries, Charlottesville, VA 22906-9050 804-974-5100
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
§† Eaton Corp./Cutler-Hammer Prods, Aerospace & Commercial Controls Div., Milwaukee, WI 53216 414-449-7487
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Flex-Key Corp., Sub. of Astronics Corp., Gloucester, MA 01930 508-281-2040
§† IEE (Industrial Electronic Engineers), Van Nuys, CA 91405 818-787-0311
International Instrumentation, Inc., Westlake Vlg, CA 91361 805-495-7673
LaFrance Corp., Philadelphia, PA 19153-3893 215-365-8000
Leecraft Mfg., Long Island City, NY 11101 718-392-8800
James Millen Elctrns., Caywood Elec. Inc., No. Andover, MA 01845 508-475-7831
† MuShield Products, Div. Bomco Inc., Gloucester, MA 01930 508-283-9000
§ NOBEX Div., Griffith Plastics Corp., Burlingame, CA 94010 415-342-8170
PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
§† Shelly Associates, Inc., Tustin, CA 92680 714-669-9850
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
† Zero Corp., Burbank, CA 90503 818-846-4191

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POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ... C•1077
§ Akro-Mils, Akron, OH 44301 216-253-5593
† Alden Systems, Alden Products Co., Brockton, MA 02403-0860 508-583-0160
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
† Contact East, N. Andover, MA 01845 508-682-2000
§ Equipto, Aurora, IL 60506 ..... 312-859-1000;800-323-0801
§ Flambeau Products Corp., Middlefield, OH 44062 216-632-1631
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Hodge Manufacturing Co., Inc., Springfield, MA 01107 413-781-6800
§ Lyon Metal Products, Aurora, IL 60507 312-892-8941
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Simco Co., Hatfield, PA 19440 215-822-2171
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963 800-328-1368
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717
Zero Corp., Burbank, CA 90503 818-846-4191

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POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ... C•1077
Akro-Mils, Akron, OH 44301 216-253-5593
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

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† **Aeroflex Laboratories Inc., ARX, Inc., Plainview, NY 11803, 516-694-6700** ..... B•1225
Cabtron Systems, Inc., Northbrook, IL 60062, 312-498-6090 ..... C•1014
Calmark Corp., San Gabriel, CA 91776, 818-287-0451 ..... C•1015
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§ **ebm Industries, Inc., Farmington, CT 06032, 203-674-1515** ..... C•1647
† **Hi-Tech, Inc., Zion, IL 60099, 312-746-2447** ..... C•1659
§ **Howard Industries, Inc., Milford, IL 60953, 815-889-4105** ..... C•1660
Interfan, William J. Purdy Co., Burlingame, CA 94010, 415-347-1203 ..... C•1670-1671
† **McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550, 609-799-0100** ..... C•1674
Papst Mechatronic Corp., Newport, RI 02840, 401-849-8810 ..... C•1683-1685
Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... C•1082
† **Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200** ..... C•1085
Stantron, Unit of Zero Corporation, N. Hollywood, CA 91605, 818-841-1825 ..... C•1098
† **Zero Corp., Burbank, CA 90503, 818-846-4191** ..... C•1122
† Amco Engineering, Schiller Pk., IL 60176 ..... 312-671-6670;800-833-3156
† Ashland Elec. Prods., Inc., Rochester, NH 03867 603-335-1100
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
Bertsch U.S., Vista, CA 92083 619-727-7420
† Brailsford & Co., Rye, NY 10580 914-967-1820
Buehler Products, Inc., Raleigh, NC 27606 919-469-8522
† Dynamic Air Engrg., Inc., Santa Ana, CA 92705-5697 714-540-1000
§† EG & G Rotron, Custom Div., Woodstock, NY 12498 914-679-5201
EG&G Rotron, Industrial Division, Saugerties, NY 12477 914-246-3401
§† Electronic Enclosures, Div. Wyle Labs, El Segundo, CA 90245 213-643-8181
† Equipto Electronics Corp., Aurora, IL 60506 312-897-4691
§† ETRI, Inc., Monroe, NC 28110 704-289-5423
§† Globe Motors, Dayton, OH 45404 513-228-3171
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
† IMC Magnetics Corp., Eastern Div., Westbury, NY 11590 516-334-7070
† Kooltronic, Inc., Hopewell, NJ 08525 609-466-3400
† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
Micronel U.S., Vista, CA 92083 619-727-7400
† Optima Enclosures, Tucker, GA 30084-5088 404-496-4000
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§ Shinano Kenshi Corp. (SKC), N. Hollywood, CA 91605 818-764-4266
† Telectro Systems Corp., Corona, NY 11368 718-651-8900
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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Amco Engineering, Schiller Pk., IL 60176, 312-671-6670;800-833-3156 ... C•1640
Emcor Products, Crenlo, Inc., Rochester, MN 55901, 507-289-3371 ..... C•1039
† **Hi-Tech, Inc., Zion, IL 60099, 312-746-2447** ..... C•1659
† Ashland Elec. Prods., Inc., Rochester, NH 03867 603-335-1100
§ ebm Industries, Inc., Farmington, CT 06032 203-674-1515
† Kooltronic, Inc., Hopewell, NJ 08525 609-466-3400
† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681

Blowers, Tangential-2600

§ **ebm Industries, Inc., Farmington, CT 06032, 203-674-1515** ..... C•1647
† **Hi-Tech, Inc., Zion, IL 60099, 312-746-2447** ..... C•1659
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Amco Engineering, Schiller Pk, IL 60176 ..... 312-671-6670;800-833-3156
Hitachi America, Ltd., Tarrytown, NY 10591 914-631-0600
† Kooltronic, Inc., Hopewell, NJ 08525 609-466-3400
† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116

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† **Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388** ..... **C•1125**
§ **Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.)** ..... **C•1093**
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... **D•1122-1123**
§ Amerex, Riverside, CA 92516 714-686-1400
APX-Arstan Products International Inc., Jericho, NY 11753 516-333-8100
† Electronic Controls Design, Mulino, OR 97042 503-829-9108
Electronic Modular Systems, Inc., Pasadena Technology Corp., Carrollton, TX 75006 214-446-2900
† Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
International Mircoelectronics, Arlington, TX 76003 817-561-2244
KDI/Triangle Electronics, Whippany, NJ 07981 201-887-5700
Mouser Electronics, Mansfield, TX 76063 800-346-6873
Precicontact, Inc., Langhorne, PA 19047 215-757-1202
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

Boards, Circuit, Unclad-1700

§ **Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.)** ..... **C•1093**
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... **D•1122-1123**
§ Amerex, Riverside, CA 92516 714-686-1400
Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
Electronic Controls Design, Mulino, OR 97042 503-829-9108
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
International Mircoelectronics, Arlington, TX 76003 817-561-2244
KDI/Triangle Electronics, Whippany, NJ 07981 201-887-5700
Mouser Electronics, Mansfield, TX 76063 800-346-6873
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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Advanced Control Sys., Pembroke, MA 02359, 617-826-4477 ..... **D•1135**
AMP, Harrisburg, PA 17105, 717-564-0100 ..... **C•1157**
§† **Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202** ..... **C•1706-1708**
Dage Precision Industries, Inc., Fremont, CA 94538, 415-683-3930 ..... **C•1710**
§† **DataCon, Inc., Burlington, MA 01803, 617-273-5800** ..... **C•1725, D•1119**
§ **Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333** ..... **C•1029**
† **E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473** ..... **C•1714-1715**
Metra Byte Corp., Taunton, MA 02780, 508-880-3000 ..... **D•1193**
§ **Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401, 508-588-6110** ..... **C•1060-1061,1716-1717**
§ **National Instruments, Austin, TX 78727-6204, 512-250-9119** ..... **D•1131,1179**
Transmagnetics, Farmingdale, NY 11735, 516-293-3100 ..... **D•1203**
§† **Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661** ..... **C•1722-1723,1727-1728**
† Accurate Electronics, Elyria, OH 44036 216-366-6330
§ Action Instruments, San Diego, CA 92123 619-279-5726
ADAC Corp., Woburn, MA 01801 617-935-6668
A.D. Data, Inc.:Photographic Sciences Corp.(PSC), Webster, NY 14580 716-265-1600
Analog Devices, Inc., Norwood, MA 02062-9106 617-329-4700
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Benchmark Technology, City of Industry, CA 91745 818-333-1201
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Burr-Brown Corp., Tucson, AZ 85734 602-746-1111
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523 415-932-3911
§ Central Data Corp., Champaign, IL 61821 217-359-8010
Cherry Electrical Products, Cherry Corporation, Waukegan, IL 60087 312-360-3500
§ Colorgraphic Communications Corp., Atlanta, GA 30366 404-455-3921
Compac, Holbrook, NY 11741 516-585-3400
§ Consolink Corp., Longmont, CO 80501 303-651-2014
§ Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
Crosspoint, Div. of Info-Lite, Fairview, NJ 07022 201-941-4455
Data Capture Technology, Hathaway Corp., Tulsa, OK 74116 918-438-5366
Datel, Inc., Mansfield, MA 02048-1194 508-339-3000
Digital Equip., Marlborough, MA 01752
Douglas Electronics, San Leandro, CA 94577 415-483-8770
§ Dynatech Computer Company, Mountain View, CA 94039-7400 415-964-7400
E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
† Eastern Electronics Mfg. Corp., National Patent Dev. Corp., East Hartford, CT 06108 203-528-9821
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
GEN/COMP Inc., Canton, MA 02021 617-828-2008
General Digital Corp., Manchester, CT 06040 203-647-9700
Ghielmetti, Inc., Los Angeles, CA 90028-8770 213-463-5111
§ Gordos, A Flint Industries Company, Rogers, AR. 72757, AR 72757 501-636-5000
§ Gunther, W., GmbH, D 8500 Nurnberg 82, WEST GERMANY ..... (0)911/65521 or 65520
G W Three Incorporated, Springfield, VA 22153 703-451-2043
† Hancock Electronics Corp., Hingham, MA 02043 617-740-4190
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
Hybricon Corporation, Ayer, MA 01432 508-772-5422
IDE Associates, Inc., Billerica, MA 01821 617-663-6878
§ Intra-computer, New York, NY 10001 212-947-5533
Ironics Incorporated, Ithaca, NY 14850 607-277-4060
ITT Sealectro, Trumbull, CT 06611 203-372-4118
JF Microsystems, Pasco, WA 99301 ..... 509-297-4294;800-532-2737
Kalmus & Assocs., Inc., Broadview, IL 60153 312-343-7004
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Logic Technology, Inc., Mtn. View, CA 94043 415-967-1007
† Mac Panel Co., High Point, NC 27264 919-884-8111
Matrox Electronic Systems, Ltd., Dorval, QU, CANADA H9P 2T4 514-685-2630
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 215-699-5373
§ Mitel Semiconductor, Mitel Corporation, Kanata, Ont., CANADA K2K 1X5 613-592-5630
§ Monolithic Sys., Englewood, CO 80112 303-790-7400
Omega Engineering, Stamford, CT 06907 800-826-6342
Omnibyte Corp., W. Chicago, IL 60185 ..... 312-231-6880;1-800-638-5022
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
Precicontact, Inc., Langhorne, PA 19047 215-757-1202
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
† Racal-Dana Instrs. Inc., Irvine, CA 92718 714-859-8999
Real Time Devices, Inc., Port Matilda, PA 16870 814-234-8087
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§ Spectrum Signal Processing Inc., Blaine, WA 98230 ..... 1-800-663-8986 (US); 604-438-7266 (Can.)
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
† Vector Electronic Co., Sylmar, CA 91342 818-365-9661
† Virginia Panel, Waynesboro, VA 22980 703-949-8376
Zlatech, San Luis Obispo, CA 93401 805-541-0488

Boards, Plug-in, Extender-3200

§† **Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202** ..... **C•1706-1708**
Dage Precision Industries, Inc., Fremont, CA 94538, 415-683-3930 ..... **C•1711,1724**
DataCon, Inc., Burlington, MA 01803, 617-273-5800 ..... **C•1725**
§ **Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333** ..... **C•1029-1030**
† **E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473** ..... **C•1714-1715**
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401, 508-588-6110 ..... **C•1060-1061,1716-1717**
§ **Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661** ..... **C•1723**
ADAC Corp., Woburn, MA 01801 617-935-6668
Applied Data Systems, Baltimore, MD 21202 ..... 800-541-2003;301-576-0335
§ Burr-Brown Corp., Tucson, AZ 85734 602-746-1111
§ Central Data Corp., Champaign, IL 61821 217-359-8010
Comark Corp., Medfield, MA 02052 508-359-8161
§ Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
Davidge Corporation, Buellton, CA 93427 805-688-9598
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
General Digital Corp., Manchester, CT 06040 203-647-9700
† Hancock Electronics Corp., Hingham, MA 02043 617-740-4190
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§ ICS Electronics Corp., San Jose, CA 95131 408-432-9009
Kinetic Systems Corp., Lockport, IL 60441 815-838-0005
Matrix Corp., Raleigh, NC 27610 919-833-2000
Micro Industries, Westerville, OH 43081 614-895-0404
Omega Engineering, Stamford, CT 06907 800-826-6342
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Prototek, Inc., Hamilton, OH 45015 513-874-5094
§ Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
Solarcom Technology, Inc., Hayward, CA 94544 415-489-3141
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Tektronix, Inc., Beaverton, OR 97077 800-835-9433

Boards, Plug-in, Interface-3200

§† **Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202** ..... **C•1706-1707**
§ **Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333** ..... **C•1029**
§ **Gordos, A Flint Industries Company, Rogers, AR. 72757, AR 72757, 501-636-5000** ..... **D•1180-1181**
† **ILC Data Device Corp., Bohemia, NY 11716, 516-567-5600** ..... **D•1183**
Matrix Corp., Indianapolis, IN 46241, 317-248-2036 ..... **D•1192**
Metra Byte Corp., Taunton, MA 02780, 508-880-3000 ..... **D•1193**
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401, 508-588-6110 ..... **C•1060-1061,1716-1717**
§ **National Instruments, Austin, TX 78727-6204, 512-250-9119** ..... **D•1131,1178,1272-1273**
Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... **C•1723**
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... **D•1122-1123**
§ Action Instruments, San Diego, CA 92123 619-279-5726
ADAC Corp., Woburn, MA 01801 617-935-6668
A.D. Data, Inc.:Photographic Sciences Corp.(PSC), Webster, NY 14580 716-265-1600
§ American Advantech Corp., San Jose, CA 95122 408-293-6786

Analog & Digital Peripherals, Inc.(ADPI), Troy, OH 45373 513-339-2241
Augat Inc., Attleboro, MA 02703 617-222-2202
Bit 3 Computer Corporation, Minneapolis, MN 55431-1393 612-881-6955
Burr-Brown Corp., Tucson, AZ 85734 602-746-1111
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523 415-932-3911
C & C Technology Inc., West Chicago, IL 60185 312-231-0015
§ Central Data Corp., Champaign, IL 61821 217-359-8010
Comark Corp., Medfield, MA 02052 508-359-8161
§ Data Translation, Inc., Marlboro, MA 01752 508-481-3700
Davidge Corporation, Buellton, CA 93427 805-688-9598
Electrologic, Inc., Signal Hill, CA 90806 213-595-0551
† Electronic Modular Systems, Inc., Pasadena Technology Corp., Carrollton, TX 75006 214-446-2900
GEN/COMP Inc., Canton, MA 02021 617-828-2008
General Digital Corp., Manchester, CT 06040 203-647-9700
§ Gunther, W., GmbH, D 8500 Nurnberg 82, WEST GERMANY ..... (0)911/65521 or 65520
G W Three Incorporated, Springfield, VA 22153 703-451-2043
† Hancock Electronics Corp., Hingham, MA 02043 617-740-4190
§ ICS Electronics Corp., San Jose, CA 95131 408-432-9009
Ironics Incorporated, Ithaca, NY 14850 607-277-4060
JF Microsystems, Pasco, WA 99301 ..... 509-297-4294;800-532-2737
† Kinetic Systems Corp., Lockport, IL 60441 815-838-0005
† K-Systems of Texas, Inc., El Paso, TX 79936 915-598-9769
Logical Design Group, Inc., Raleigh, NC 27607 919-851-1101
Mac Panel Co., High Point, NC 27264 919-884-8111
Matrix Corp., Raleigh, NC 27610 919-833-2000
Micro Industries, Westerville, OH 43081 614-895-0404
Omega Engineering, Stamford, CT 06907 800-826-6342
Opto 22, Huntington Bch., CA 92649 714-891-5861
Paracom Inc., West Chicago, IL 60185 312-293-9500
QSI Corporation, Logan, UT 84321 801-753-3657
† Racal-Dana Instrs. Inc., Irvine, CA 92718 714-859-8999
§ Rapid Systems Inc., Seattle, WA 98103 206-547-8311
§ Sensoray Corp., Fremont, CA 94538 415-657-7290
Serial Lab Prods., Inc., Marlboro, MA 01752 617-481-1684
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Strawberry Tree Computers, Sunnyvale, CA 94086 408-736-3083
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
TL Inds. Inc., Northwood, OH 43619 419-666-8144
§ Via West Interface, Inc., Tucson, AZ 85705 602-623-5716
Ziatech, San Luis Obispo, CA 93401 805-541-0488

Boards, Plug-in, Memory-3200

Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1122-1123
§ Action Instruments, San Diego, CA 92123 619-279-5726
ADAC Corp., Woburn, MA 01801 617-935-6668
Alligator Technologies, Fountain Valley, CA 92708 714-850-9984
Altair Exchange Corporation, Northridge, CA 91324 ..... 818-701-6977;800-824-5620
§ Capital Equipment Corporation, Burlington, MA 01803 617-273-1818
§ Central Data Corp., Champaign, IL 61821 217-359-8010
Charles River Data Systems, Inc., Framingham, MA 01701 508-626-1000
Comark Corp., Medfield, MA 02052 508-359-8161
§ Computer System Assocs., San Diego, CA 92121 619-566-3911
Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
Dataram Corp., Princeton, NJ 08543-7528 ..... 609-799-0071;800-822-0071
Davidge Corporation, Buellton, CA 93427 805-688-9598
† Electronic Modular Systems, Inc., Pasadena Technology Corp., Carrollton, TX 75006 214-446-2900
General Digital Corp., Manchester, CT 06040 203-647-9700
§ GENROCO, Inc., Slinger, WI 53086-9407 414-644-8700
G W Three Incorporated, Springfield, VA 22153 703-451-2043
† Hancock Electronics Corp., Hingham, MA 02043 617-740-4190
IDE Associates, Inc., Billerica, MA 01821 617-663-6878
Ironics Incorporated, Ithaca, NY 14850 607-277-4060
JF Microsystems, Pasco, WA 99301 ..... 509-297-4294;800-532-2737
Kinetic Systems Corp., Lockport, IL 60441 815-838-0005
Logical Design Group, Inc., Raleigh, NC 27607 919-851-1101
Matrix Corp., Raleigh, NC 27610 919-833-2000
Memory X, San Diego, CA 92123 619-292-1151
Micro Industries, Westerville, OH 43081 614-895-0404
§ Monolithic Sys., Englewood, CO 80112 303-790-7400
Pacific Microcomputers, Signal Technology, San Diego, CA 92121 619-453-8649
Paracom Inc., West Chicago, IL 60185 312-293-9500
QSI Corporation, Logan, UT 84321 801-753-3657
SGS-THOMSON Microelectronics, Phoenix, AZ 85022 602-867-6100
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
TL Inds. Inc., Northwood, OH 43619 419-666-8144
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
Ziatech, San Luis Obispo, CA 93401 805-541-0488

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§† Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1706-1708
Dage Precision Industries, Inc., Fremont, CA 94538, 415-683-3930 ..... C•1724
DataCon, Inc., Burlington, MA 01803, 617-273-5800 ..... C•1725
§ Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1029
† E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473 ..... C•1714-1715
§ Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.) ..... C•1092-1093
§ Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1723
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1123
Wintek Corp., Lafayette, IN 47904-2993, 317-742-8428;800-742-6809 ..... D•1124
§ American Advantech Corp., San Jose, CA 95122 408-293-6786
† Assembly Specialists, Acton, MA 01720 617-263-9100
§ Central Data Corp., Champaign, IL 61821 217-359-8010
Comark Corp., Medfield, MA 02052 508-359-8161
§ Computer System Assocs., San Diego, CA 92121 619-566-3911
§ Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
General Digital Corp., Manchester, CT 06040 203-647-9700
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
Hybricon Corporation, Ayer, MA 01432 508-772-5422
JF Microsystems, Pasco, WA 99301 ..... 509-297-4294;800-532-2737
Logical Design Group, Inc., Raleigh, NC 27607 919-851-1101
Matrix Corp., Raleigh, NC 27610 919-833-2000
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Micro Industries, Westerville, OH 43081 614-895-0404
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Prototek, Inc., Hamilton, OH 45015 513-874-5094
QSI Corporation, Logan, UT 84321 801-753-3657
Real Time Devices, Inc., Port Matilda, PA 16870 814-234-8087
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
Solarcom Technology, Inc., Hayward, CA 94544 415-489-3141
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
TL Inds. Inc., Northwood, OH 43619 419-666-8144
Trend Circuits, Fremont, CA 94536 415-651-1150
Ziatech, San Luis Obispo, CA 93401 805-541-0488

Boards, Prewired, High Density-3200

Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1708
† E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473 ..... C•1714
Gordos, A Flint Industries Company, Rogers, AR. 72757, AR 72757, 501-636-5000 ..... D•1180-1181
§ Circuitech, Inc., Division of Heyco, Inc., Eatontown, NJ 07724 201-542-6550
Hybricon Corporation, Ayer, MA 01432 508-772-5422
Matrix Corp., Raleigh, NC 27610 919-833-2000
Micro Industries, Westerville, OH 43081 614-895-0404
Racal-Dana Instrs. Inc., Irvine, CA 92718 714-859-8999
§ Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700

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E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473 ..... C•1714-1715
Grim Corporation, Medford, NJ 08055-0968, 609-267-7950 ..... D•1068
Information Transfer Indl. Inc., Holcomb, NY 14469, 716-657-7074 ..... D•1187
Inland Motor/Kollmorgen, Sierra Vista, AZ 85635, 602-459-1150 ..... B•1265
§ Kepco, Inc., Flushing, NY 11352, 718-461-7000 ..... D•1851-1853
Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1722, 1727-1728
† Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1122-1123
Accurate Electronics, Elyria, OH 44036 216-366-6330
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
American Control Technology, Inc., West Dundee, IL 60118 312-426-6780
AMP, Harrisburg, PA 17105 717-564-0100
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
Augat Inc., Attleboro, MA 02703 617-222-2202
Crosspoint, Div. of Info-Lite, Fairview, NJ 07022 201-941-4455
Data Capture Technology, Hathaway Corp., Tulsa, OK 74116 918-438-5366
§ Data Translation, Inc., Marlboro, MA 01752 508-481-3700
Digital Equip., Marlborough, MA 01752
Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121 619-452-9333
Enerco, Inc., Seattle, WA 98108 206-762-1422
GEN/COMP Inc., Canton, MA 02021 617-828-2008
Ghielmetti, Inc., Los Angeles, CA 90028-8770 213-463-5111
† Hancock Electronics Corp., Hingham, MA 02043 617-740-4190
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
IDE Associates, Inc., Billerica, MA 01821 617-663-6878
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Mac Panel Co., High Point, NC 27264 919-884-8111
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Micro Industries, Westerville, OH 43081 614-895-0404
Oliver Advanced Engineering, Glendale, CA 91203 818-240-0080
† Oxley, Inc., Branford, CT 06405 203-488-1033
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
§ Pulse Instruments Co., Torrance, CA 90502 213-515-5330
† Racal-Dana Instrs. Inc., Irvine, CA 92718 714-859-8999
§ Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
† Virginia Panel, Waynesboro, VA 22980 703-949-8376

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§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180, 605-665-9301 ..... A•1238
Renco Electronics, Inc., Deer Pk., NY 11729, 516-586-5566;1-800-645-5828 ..... A•1293-1294,1296-1297,2436,2439

Siemens Components, Inc., Special Products Div., Iselin, NJ 08830, 201-321-3400 ..... A•1331
† Apollo Magnetics Corp., Los Angeles, CA 90057 213-381-2500
Cortec, Inc., Huntington Bch., CA 92649 714-897-2529
Cosmo Corporation, Cleveland, OH 44109 216-861-5594
† Dia-Netics, Inc., Northridge, CA 91324 818-886-2616
§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
Electro Assemblies Corp., Northbrook, IL 60062 312-498-6520
Electromech, Inc., Kearny, NJ 07032 201-997-0950
Engineering Design & Sls., Danville, VA 24541 804-792-6405
§ Ferroxcube, Amperex Electronic Corp., Saugerties, NY 12477 914-246-2811
† Genisco Technology Corp., La Mirada, CA 90638 714-523-7001
Grand Transformers, Grand Haven, MI 49417 616-842-5430
Harbison Industrial Products, Levittown, PA 19057 215-943-9000
§ ISKRA Electronics, Inc., Plainview, NY 11803 516-349-0222
§† Krystinel Corp., Paterson, NJ 07509 201-345-8900
† Magnetico Inc., Holtsville, NY 11742 516-654-1166
† Micro-Products Engineering Co., Newark, NJ 07108 201-824-8467
† Moldtronics, Inc., Downers Grove, IL 60515 312-968-7000
Nedap N.V., Groenlo, HOLLAND 7140 AA ..... +31-5440-71111
Plasticorp, Harbor City, CA 90710 213-539-9530
RCD Components, Inc., Manchester, NH 03103 603-669-0054
† Shogyo International Corp., Great Neck, NY 11021 516-466-0911
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Staffall Inc., Cranston, RI 02910 401-461-5554
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
Thermotech Div. of Menasha Corp., Hopkins, MN 55343 612-933-9400
§ Tokin America, Inc., San Jose, CA 95134 408-432-8020
† Wayne Transformers Co., Inc., A Marine Electric Systems Co., Clifton, NJ 07014-1135 201-614-1100
Xylog Corp., Hackensack, NJ 07601 201-489-4040

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Bolts-2500

† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
Micro Plastics Inc., Flippin, AR 72634 501-453-2261

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§ EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1470,1912-1913
§ Perma Power Elctrns., Chicago, IL 60648, 312-647-9414 ..... C•1621
§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
§ Adalet-PLM Div, Div. Scott & Fetzer Co., Cleveland, OH 44135 216-267-9000
† Alarm Controls Corporation, Deer Park, NY 11729 516-586-4220
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Amerex, Riverside, CA 92516 714-686-1400
Atlas/Soundolier, Fenton, MO 63026 314-349-3110
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ Brooks Electronics, Philadelphia, PA 19140 215-228-4433
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§† Ericson Manufacturing Co., Willoughby, OH 44094 216-951-8000
Fil-Coil Company, Inc., Garden City, NY 11530 516-228-9445
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
International Configurations, Inc., Enfield, CT 06082 203-749-6380
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ L-Com Inc., N. Andover, MA 01845 508-682-6936
Marway Prods. Inc., Santa Ana, CA 92703 714-973-1800
§ PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
Pomona Electronics, Pomona, CA 91766 714-623-3463
Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§† Rose Enclosures Sys., Inc., Frederick, MD 21701 301-696-9800
Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
† Shogyo International Corp., Great Neck, NY 11021 516-466-0911
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ SL Waber, Inc., Mt. Laurel, NJ 08054 ..... 609-866-8888;800-257-8384
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Todd Systems, Inc., Yonkers, NY 10701 914-963-3400
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
§ The Wiremold Company, W. Hartford, CT 06110 203-233-6251
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
† Zero Corp., Burbank, CA 90503 818-846-4191
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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Boxes, Power Outlet — See Boxes, Junction, Outlets & Wall Plates (Vol. C)

Boxes, Shipping (Reusable) — See Enclosures, Shipping (Vol. C)

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Braid, Cable-Also See Wire Shielding-6000

Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1767
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1820,1826-1827
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1860-1862
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1743
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1928-1931,1941,1947,1954
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
† Air/Flex Inds. Inc., S. El Monte, CA 91733 818-579-7060
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Baron Wire & Cable, Skokie, IL 60076 312-677-5000
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
Federal Electronics, Cranston, RI 02921 401-944-6200
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Markel Corp., Norristown, PA 19404 215-272-8960
Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Storm Products Co., Hinsdale, IL 60521 312-323-9121
† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Brakes, Clutches, Electromechanical-3500 — *See Vol. B*

Brakes, Magnetic-3500 — *See Vol. B*

Brakes, Mechanical-3500 — *See Vol. B*

Breadboard Assemblies-4200

3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438
Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1722, 1727-1728
§† Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
Contact East, N. Andover, MA 01845 508-682-2000
Douglas Electronics, San Leandro, CA 94577 415-483-8770
† Eastern Electronics Mfg. Corp., National Patent Dev. Corp., East Hartford, CT 06108 203-528-9821
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
Hybricon Corporation, Ayer, MA 01432 508-772-5422
Micro Industries, Westerville, OH 43081 614-895-0404
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
Noll, J. A. Co., Monroeville, PA 15146 412-733-1089
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Vector Electronic Co., Sylmar, CA 91342 818-365-9661

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Bridges, Impedance-2900 — *See Vol. D*

Bridges, Inductance-2900 — *See Vol. D*

Bridges, Kelvin-2900 — *See Vol. D*

Bridges, LCR-2900 — *See Vol. D*

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Bridges, Megohm — See Bridges, Resistance (Vol. D)

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Bridges, Strain Gauge-2900 — *See Vol. D*

Bridges, Synchro & Resolver-2900 — *See Vol. D*

Bridges, Telephone/Data-1900 — *See Vol. D*

Bridges, Temperature-2900 — *See Vol. D*

Bridges, Wheatstone-2900 — *See Vol. D*

Brushes & Brush Assemblies-3500 — *See Vol. B*

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Bumpers-2500

† **Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151** ..... **C•1733**
§ **Gasket Dynamics, Inc., Mt. Holly, NJ 08060, 609-261-8100;800-541-2500;215-922-6046** ..... **C•1618**
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... **C•1387**
§† **Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800** ..... **C•1586**
† Alasco Rubber & Plastics Corp., Belmont, CA 94002 415-595-4100
§ Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
Bumper Products Corp., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
Gasket International Inc., Bloomfield, NJ 07003 201-338-6814
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Minor Rubber Co., Inc., Bloomfield, NJ 07003 ..... 201-338-6800;800-433-6886

Burnishers, Contact-5400

§ Applied Data Communications, Tustin, CA 92680 714-731-9000
Caig Labs., Escondido, CA 92025 619-743-7143
† Contact East, N. Andover, MA 01845 508-682-2000
§ Eraser Co., Syracuse, NY 13221 315-454-3237
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
Shogyo International Corp., Great Neck, NY 11021 516-466-0911
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Burnishers, Flexible Head-5400

§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700

Bus Bars, Surface Mount-3200

Motorola Semiconductor Prods. Sector, Phoenix, AZ 85018-6606, 602-244-6900 ..... **A•1760**
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... **D•1122-1123**
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
§ Electronic Applications Co., El Monte, CA 91734 818-442-3212
Rogers Corp. Div. Power Distbn.Div., Mesa, AZ 85205 602-830-3370
Rogers Corporation, Circuit Components Div., Tempe, AZ 85282 602-967-0624
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

Bus Bars & Systems-3200

† **Atlee Inc., North Andover, MA 01845, 508-681-1003** ..... **C•1704,1732**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
Dage Precision Industries, Inc., Fremont, CA 94538, 415-683-3930 ..... **C•1724**
† **ILC Data Device Corp., Bohemia, NY 11716, 516-567-5600** ..... **D•1182**
† **Janco Corp., Burbank, CA 91504, 818-846-1800** ..... **B•1779**
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... **C•1091**
§† **Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300** ..... **C•1720-1721**
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... **D•1122-1123**
§ Altech Corp., Somerville, NJ 08876 201-359-4454
† American Etching & Mfg., Pacoima, CA 91331-2796 818-896-1187
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Basic Electronics, Inc., Stanton, CA 90680 714-530-2400
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Eaton Corp./Cutler-Hammer Prods, Aerospace & Commercial Controls Div., Milwaukee, WI 53216 414-449-7487
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§† Lear Siegler, Inc., Telecommunications Div., Anaheim, CA 92801 714-774-1010
† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
Rogers Corp. Div. Power Distbn.Div., Mesa, AZ 85205 602-830-3370
† Rogers Corp., Rogers, CT 06263 203-774-9605
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
† Zero Corp., Burbank, CA 90503 818-846-4191

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§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
† **Graphite Metallizing Corp., Yonkers, NY 10702, 914-968-8400** ..... **B•1252**
§ **Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182** ..... **C•1863**
§ **Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213** ..... **C•1373**
§ **Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800** ..... **C•1586**
† **Unicorp, Orange, NJ 07050, 201-674-1700** ..... **C•1628-1629**
§ Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
§ Adalet-PLM Div, Div. Scott & Fetzer Co., Cleveland, OH 44135 216-267-9000
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
† Alasco Rubber & Plastics Corp., Belmont, CA 94002 415-595-4100
Alberox Corporation, New Bedford, MA 02745 508-995-1725
§ Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Atlantic Optical Moulding, Webster, MA 01570 617-943-1746
Auburn Mfg., Middletown, CT 06457 203-346-6677
Autoswage Products, Shelton, CT 06484 203-929-1401
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Bivar, Inc., Irvine, CA 92718 714-951-8808
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
† Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
† General Manufacturing, Glendale, CA 91201 818-243-2069
† Globe Plastics, Pomona, CA 91766 714-623-2747
ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Moldtronics, Inc., Downers Grove, IL 60515 312-968-7000
§ Norelcom Inds., Farmingdale, NY 11735 516-249-7245
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Polymer Corp., Reading, PA 19605 215-320-6600
§ RAF Electronic Hardware, Seymour, CT 06483 203-888-2133
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
† Standard Insert Co., Penn Engrg. & Mfg. Corp., Horsham, PA 19044 215-956-0350
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk., NY 11040 ..... 516-328-0200;328-3300
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
§ Thermalloy, Inc., Dallas, TX 75381-0839 214-243-4321
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... **C•1760-1761**
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... **C•1267**
§ **Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200** ..... **C•1765**
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. **C•1766**
§ **Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1** ..... **C•1768**
§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... **C•1823-1825**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... **C•1386,1864**
Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... **B•1019**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... **C•1870**
§ **Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000** .... **C•1873**
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886,1889-1892,1901,1903**
† **Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761** ..... **C•1519**
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ... **C•1526,1921**
§† **Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100** ..... **C•1924**
Accurate Electronics, Elyria, OH 44036 216-366-6330
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
§ Dukane Corp., Communications Sys. Div., St. Charles, IL 60174-9984 ... 312-584-2300
† Electro Weave, Worcester, MA 01604 617-752-8932
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
† Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
§ Harris Corp., Dracon Div., Camarillo, CA 93010 805-987-9511
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
International Components Corp., Melville, NY 11747 516-293-1500
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106 312-766-7800
§† Microtech, Boothwyn, PA 19061 215-459-3566
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
§ Recoton Corp., Long Island City, NY 11101 718-392-6442
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 914-429-3103
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§ Vidaire Electronics Mfg. Corp., W. Babylon, NY 11704 516-491-1826
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400

Cable, Battery Booster-6000

† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ... **C•1526,1921**
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990

Cable, Coaxial-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... **C•1760-1762**
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... **C•1763**
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... **C•1266**
Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... **C•1765**
§ **Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365** ..... **C•1766-1767**
§† **Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1** ..... **C•1768**
§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... **C•1823**
§ **Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103** ..... **C•1308**
§† **Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708** ..... **C•1831,1833,1836-1839**
§† **Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830** ..... **C•1840-1841,1843-1844**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
§ **E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175** ..... **C•1351**
Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... **C•1859**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... **C•1422,1425, 1868**
§ **Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000** .... **C•1873**
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886**
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... **C•1917**
† **Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761** ..... **C•1517,1519,1922**
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ... **C•1526,1921**
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... **C•1942-1943**
§† Adams-Russell Electronics Co., Inc., Amesbury, MA 01913 508-388-5210
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
AMP, Harrisburg, PA 17105 717-564-0100
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
Andrew Corp., Orland Pk, IL 60462 800-255-1479
† Antenna Specialists, The Allen Group, Cleveland, OH 44139 216-349-8400
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§† Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Brooks Electronics, Philadelphia, PA 19140 215-228-4433
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§† Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§† Capcon, Inc., New York, NY 10001 212-243-6275
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
† Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
† Coaxitube Corp., Salisbury, MD 21801 301-546-3911
† Compac, Holbrook, NY 11741 516-585-3400
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
† Electro Weave, Worcester, MA 01604 617-752-8932
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
John Fluke Mfg. Co., Inc., Everett, Wa 98206, WA 98206 206-356-5400
† Gabriel Electronics, Scarborough, ME 04074 207-883-5161
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† GSI Corp., Timonium, MD 21093 301-252-1768
† Gulton Industries, Inc., Servonic Div., Costa Mesa, CA 92627 ..... 714-642-2400; 800-854-4066
§ Heath Co., St. Joseph, MI 49085 616-982-3200
Hewlett-Packard Co., Cupertino, CA 95014 800-752-0900
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
IDE Associates, Inc., Billerica, MA 01821 617-663-6878
International Components Corp., Melville, NY 11747 516-293-1500
§† JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Lance Industries, Sylmar, CA 91342-0156 818-367-1811
§ L-Com Inc., N. Andover, MA 01845 508-682-6936
§† Markel Corp., Norristown, PA 19404 215-272-8960
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
† Micro Mode Prods., El Cajon, CA 92020 619-449-3844
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§† Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996

† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
† Plastoid Corporation, Hamburg, NJ 07419 201-827-7141
§† Precision Tube, N. Wales, PA 19454 215-699-5801
§† Probe Master, Inc., San Diego, CA 92111 ..... 619-560-9676;800-854-1519; 800-772-1519
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Reactel, Inc., Rockville, MD 20850 301-279-5535
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§ Speco Div., Components Specialties, Inc., Lindenhurst, NY 11757 ..... 516-957-8700; 800-645-5516
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§† Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Terminal Data Corp., Rockville, MD 20855 301-921-8282
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100
§ Wiltron, Morgan Hill, CA 95037-2809 408-778-2000
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, Communication-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1765
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1766
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1822-1825
Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831-1832,1834-1835,1837-1839
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1852
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1900
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1932-1943,1946,1948-1949
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chabin Corp., Chico, CA 95926 916-891-6410
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
† The First Electronics Corp., Boston, MA 02125 617-288-2430
Gandalf Data Inc., Gandalf Technologies Inc., Wheeling, IL 60090 ..... 312-541-6060; 800-GANDALF
General Electric Co., Accessory Equipment Plant, Bridgeport, CT 06602 203-382-2000
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† GSI Corp., Timonium, MD 21093 301-252-1768
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ L-Com Inc., N. Andover, MA 01845 508-682-6936
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
† Optical Cable Corp., Salem, VA 24153-0999 703-389-9900
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
† Plastoid Corporation, Hamburg, NJ 07419 201-827-7141
Precision Interconnect, Portland, OR 97224 503-620-9400
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Pylon Elex Development Co. Ltd., Lachine, PQ, CANADA H8S 1Z3 514-637-1186
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Via West Interface, Inc., Tucson, AZ 85705 602-623-5716

Cable, Computer-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 ..... C•1767, D•1078
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1822,1824
§† Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831,1835,1838-1839
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1840-1842,1844-1845
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848-1849,1852-1853
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1782
Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886,1897-1898
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1526,1921
§† Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1924-1925
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1945
† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
Applied Software Tech., Inc., Atlanta, GA 30329 404-663-8660
§† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chabin Corp., Chico, CA 95926 916-891-6410
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§ Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
† Electroprep, Inc., Cataumet, MA 02534 617-563-5559
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ Ergotron, Inc., Eagan, MN 55121 612-452-8135
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
† GSI Corp., Timonium, MD 21093 301-252-1768
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
§ International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§† Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
† Lamtech Electronics, Garland, TX 75042 214-272-3504
LZR Electronics, Inc., Gaithersburg, MD 20879 301-921-9440
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
† N.E.D. Cable Co., Div. of Electro-Prep, Inc., Salem, MA 01970 617-745-9911
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101

§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
† Optical Cable Corp., Salem, VA 24153-0999 703-389-9900
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Precision Interconnect, Portland, OR 97224 503-620-9400
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Pylon Elex Development Co. Ltd., Lachine, PQ, CANADA H8S 1Z3 514-637-1186
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Via West Interface, Inc., Tucson, AZ 85705 602-623-5716
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, Data Transmission-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 ..... C•1766, D•1078
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1824-1826
§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831-1832,1834-1835,1838
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1840-1842,1844
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886,1897-1898
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519
§† Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1923-1925
† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ American Advantech Corp., San Jose, CA 95122 408-293-6786
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
§† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chabin Corp., Chico, CA 95926 916-891-6410
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† GSI Corp., Timonium, MD 21093 301-252-1768
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
L-Com Inc., N. Andover, MA 01845 508-682-6936
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Nu Data, Inc., Little Silver, NJ 07739 201-842-5757
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Precision Interconnect, Portland, OR 97224 503-620-9400
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Telebyte Technology, Inc., Greenlawn, NY 11740 ..... 516-423-3232;800-835-3298
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
† Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§ Via West Interface, Inc., Tucson, AZ 85705 602-623-5716
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1821,1824
§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831,1836-1837
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1844
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§† Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† The First Electronics Corp., Boston, MA 02125 617-288-2430
FLEX-Link Products, Inc., San Fernando, CA 91340 818-898-1451
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† GSI Corp., Timonium, MD 21093 301-252-1768
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Markel Corp., Norristown, PA 19404 215-272-8960
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Precision Interconnect, Portland, OR 97224 503-620-9400
Radix Wire Co., Cleveland, OH 44132 216-731-9191
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
† Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

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Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1821,1823-1826
Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831,1836
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1842
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519,1922
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
† Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411

§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Electro Weave, Worcester, MA 01604 617-752-8932
Fibronics International Inc., Communications Way, Hyannis, MA 02601-1892 508-778-0700
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† GSI Corp., Timonium, MD 21093 301-252-1768
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Markel Corp., Norristown, PA 19404 215-272-8960
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Roanwell, New York, NY 10014 212-989-1090
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
† Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760,1762
§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1765
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1275
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1826
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ... C•1299
CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1321-1322
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1351
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1860-1861
§† 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Phoenix Wire, Inc., S. Hero, VT 05486, 802-372-4561 ..... C•1915
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1919
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1526,1921
Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1923
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 .... C•1947,1950-1951
† Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
§† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Basic Electronics, Inc., Stanton, CA 90680 714-530-2400
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
Caristrap Internatonal, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§ Datatran Corp., Denver, CO 80223 303-778-0870
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
† Electro Weave, Worcester, MA 01604 617-752-8932
FLEX-Link Products, Inc., San Fernando, CA 91340 818-898-1451
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
General Electric Co., Accessory Equipment Plant, Bridgeport, CT 06602 203-382-2000
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
§ International Instrumentation, Inc., Westlake Vlg, CA 91361 805-495-7673
International Mircoelectronics, Arlington, TX 76003 817-561-2244
† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Lance Industries, Sylmar, CA 91342-0156 818-367-1811
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
LZR Electronics, Inc., Gaithersburg, MD 20879 301-921-9440
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Molecu-Wire, Farmingdale, NJ 07727 201-938-9473
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, Heater-6000

§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
Acme Elec. Heating Corp., Hialeah, FL 33013 305-685-8326
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§ Markel Corp., Norristown, PA 19404 215-272-8960
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, High Temperature (Over 125° C)-6000

§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1820-1821,1826
§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1844
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519,1922
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§† Adams-Russell Electronics Co., Inc., Amesbury, MA 01913 508-388-5210

Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
§† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
Alden Products Co., Brockton, MA 02403 508-583-0160
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
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§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
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§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
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Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
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§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
† Engine Systems Division, Simmonds Precision, Norwich, NY 13815 607-335-5000
† The First Electronics Corp., Boston, MA 02125 617-288-2430
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† GSI Corp., Timonium, MD 21093 301-252-1768
† Gulton Industries, Inc., Servonic Div., Costa Mesa, CA 92627 ..... 714-642-2400; 800-854-4066
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Offlex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
Radix Wire Co., Cleveland, OH 44132 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§† Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
† Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100
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§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
Bertan Assocs., Hicksville, NY 11801, 516-433-3110 ..... D•1649
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1820,1824
† Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1303-1304
Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1843-1844
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1851
Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517,1519,1922
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
† Adams-Russell Electronics Co., Inc., Amesbury, MA 01913 508-388-5210
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
AMP, Harrisburg, PA 17105 717-564-0100
Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Continental Resources, Inc, Test Instruments Div., Bedford, MA 01730 ... 617-275-0850; 800-937-4688
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Electro Weave, Worcester, MA 01604 617-752-8932
† Engine Systems Division, Simmonds Precision, Norwich, NY 13815 607-335-5000
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
General Electric Co., Accessory Equipment Plant, Bridgeport, CT 06602 203-382-2000
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
High Voltage Technology Inc., Yonkers, NY 10701 914-423-6636
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
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Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
Radix Wire Co., Cleveland, OH 44132 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
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Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1782
§ American Advantech Corp., San Jose, CA 95122 408-293-6786
§ Capital Equipment Corporation, Burlington, MA 01803 617-273-1818
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
John Fluke Mfg. Co., Inc., Everett, Wa 98206, WA 98206 206-356-5400
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
Strawberry Tree Computers, Sunnyvale, CA 94086 408-736-3083
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311

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§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1766
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1823-1825
Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1840,1845
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
§ L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1782
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886,1889-1896,1899,1901-1903
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519
§† Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1923,1925
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
† Bailey Controls Co., Div. of Babcox & Wilcox, Wickliffe, OH 44092 216-585-8500
† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Ceramaseal, New Lebanon, NY 12125 518-794-7800
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600

§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† GSI Corp., Timonium, MD 21093 301-252-1768
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Markel Corp., Norristown, PA 19404 215-272-8960
† National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Precision Interconnect, Portland, OR 97224 503-620-9400
§† Probe Master, Inc., San Diego, CA 92111 ..... 619-560-9676;800-854-1519; 800-772-1519
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 914-429-3103
§ Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
Systems Research Laboratories, Arvin/Calspan, Dayton, OH 45440 513-426-6000
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Terminal Data Corp., Rockville, MD 20855 301-921-8282
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1846
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848-1849
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§ Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
† The First Electronics Corp., Boston, MA 02125 617-288-2430
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
† GSI Corp., Timonium, MD 21093 301-252-1768
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
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† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
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Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
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§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
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§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
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§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
§ Electro Standards Lab., Inc., Providence, RI 02940 401-943-1164
Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† GSI Corp., Timonium, MD 21093 301-252-1768
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
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§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
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Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
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Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
§ AKG Acoustics, Inc., Stamford, CT 06902 203-348-2121
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
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§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000

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§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Roanwell, New York, NY 10014 212-989-1090
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Shure Brothers Inc., Evanston, IL 60202-3696 312-866-2200
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
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§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
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† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§ Vidaire Electronics Mfg. Corp., W. Babylon, NY 11704 516-491-1826
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400

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§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1765
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§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1823-1826
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§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1853
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1860-1861
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... C•1882
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886,1889-1894,1896-1903
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ... C•1911,1914
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1919
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1526,1921
§† Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1923-1924
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1932-1941,1951-1953
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
† Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Baron Wire & Cable, Skokie, IL 60076 312-677-5000
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
† The First Electronics Corp., Boston, MA 02125 617-288-2430
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
† Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
International Components Corp., Melville, NY 11747 516-293-1500
§ International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§† JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Lance Industries, Sylmar, CA 91342-0156 818-367-1811
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§† Markel Corp., Norristown, PA 19404 215-272-8960
Meyer Wire & Cable Co., Div. of Cole Hersee Co., Hamden, CT 06514 ... 203-281-0817
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
Mouser Electronics, Mansfield, TX 76063 800-346-6873
National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
National Tel-Tronics, Meadville, PA 16335 814-724-6440
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Oflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§† Revere Corporation of America, Wallingford, CT 06492 203-269-7701
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 914-429-3103
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
† Teledyne Aerospace Sys., Fairmont, MN 56031 507-235-3355
§† Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, Plenum-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831-1832,1836-1839
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1942-1946
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§ Electro Standards Lab., Inc., Providence, RI 02940 401-943-1164
Fibronics International Inc., Communications Way, Hyannis, MA 02601-1892 508-778-0700
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† GSI Corp., Timonium, MD 21093 301-252-1768
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
† Optical Cable Corp., Salem, VA 24153-0999 703-389-9900
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300

§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Terminal Data Corp., Rockville, MD 20855 301-921-8282
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
APX-Arstan Products International Inc., Jericho, NY 11753, 516-333-8100 ..... A•2245
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
ETRI, Inc., Monroe, NC 28110, 704-289-5423 ..... C•1658
§ Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... C•1859
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1416
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
Panel Components Corp., Santa Rosa, CA 95406; 707-523-0600 ..... C•1470,1910-1911,1914
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1916
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517,1519,1922
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1526,1921
† Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Baron Wire & Cable, Skokie, IL 60076 312-677-5000
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
† Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
† The First Electronics Corp., Boston, MA 02125 617-288-2430
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
International Configurations, Inc., Enfield, CT 06082 203-749-6380
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§† Linemaster Switch, Woodstock, CT 06281 203-974-1000
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
Meyer Wire & Cable Co., Div. of Cole Hersee Co., Hamden, CT 06514 ... 203-281-0817
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Storm Products Co., Hinsdale, IL 60521 312-323-9121
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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Cable Retractors-1400

Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1085
§† Accuride, Santa Fe Springs, CA 90670 213-903-0373
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
Jonathan Manufacturing Corp., Fullerton, CA 92631 714-526-4651
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900

Cable, Ribbon — See Cable, Flat (Vol. C)

Cable, Rotator Antenna — See Cable, Multiconductor (Vol. C)

Cable, Satellite-6000

§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Andrew Corp., Orland Pk., IL 60462 800-255-1479
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† GSI Corp., Timonium, MD 21093 301-252-1768
International Components Corp., Melville, NY 11747 516-293-1500
§† Microwave Systems Inc., Syracuse, NY 13211-2100 315-437-9951
§ Offlex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1852
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
§ Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† GSI Corp., Timonium, MD 21093 301-252-1768
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

Cable, Shielded-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1765
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1766
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1820-1825
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ... C•1299
§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831-1833,1836-1839
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1840-1845
CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1322-1323
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848-1850
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1861
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... B•1019
L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1782
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868-1869
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1743
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886,1889-1894,1896-1903
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1917
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519,1922
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1526,1921

Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... **C•1934-1940,1943-1945,1947-1949,1952-1959**

† Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
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§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
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Caton Connector Corp., Kingston, MA 02364 617-585-4315
§† Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
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§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
† Electro Weave, Worcester, MA 01604 617-752-8932
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
† The First Electronics Corp., Boston, MA 02125 617-288-2430
† Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
§† Gordon Co.:Watlow, Richmond, IL 60071 815-678-2211
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§ Harris Corp., Dracon Div., Camarillo, CA 93010 805-987-9511
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§† Markel Corp., Norristown, PA 19404 215-272-8960
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
Mouser Electronics, Mansfield, TX 76063 800-346-6873
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§† Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
† Plastoid Corporation, Hamburg, NJ 07419 201-827-7141
§† Precision Tube, N. Wales, PA 19454 215-699-5801
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§† Remee Products Corp., Florida, NY 10921 914-651-4431
§† Revere Corporation of America, Wallingford, CT 06492 203-269-7701
† Roanwell, New York, NY 10014 212-989-1090
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 914-429-3103
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§ Speco Div., Components Specialties, Inc., Lindenhurst, NY 11757 ..... 516-957-8700; 800-645-5516
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
† Teledyne Aerospace Sys., Fairmont, MN 56031 507-235-3355
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Terminal Data Corp., Rockville, MD 20855 301-921-8282
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Cable, Speaker-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... **C•1768**
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. **C•1848**
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Shure Brothers Inc., Evanston, IL 60202-3696 312-866-2200
§ Speco Div., Components Specialties, Inc., Lindenhurst, NY 11757 ..... 516-957-8700; 800-645-5516
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

Cable, Telephone-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... **C•1768**
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... **C•1825**
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... **C•1840-1841**
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. **C•1848**
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... **C•1386,1864**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... **C•1416,1427-1429,1869**
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... **C•1873**
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886**
§† Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... **C•1923-1924**
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... **C•1946**
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Meyer Wire & Cable Co., Div. of Cole Hersee Co., Hamden, CT 06514 ... 203-281-0817
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Mouser Electronics, Mansfield, TX 76063 800-346-6873
† National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
† Plastoid Corporation, Hamburg, NJ 07419 201-827-7141
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, TFE Insulated-6000

§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1820
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1844
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850-1851
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Phoenix Wire, Inc., S. Hero, VT 05486, 802-372-4561 ..... C•1915
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§† Adams-Russell Electronics Co., Inc., Amesbury, MA 01913 508-388-5210
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chabin Corp., Chico, CA 95926 916-891-6410
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Electro Weave, Worcester, MA 01604 617-752-8932
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† GSI Corp., Timonium, MD 21093 301-252-1768
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§† Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Precision Interconnect, Portland, OR 97224 503-620-9400
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Storm Products Co., Hinsdale, IL 60521 312-323-9121
§† Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, Thermocouple-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... C•1907
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† DELTA M Corporation, Oak Ridge, TN 37830 615-483-1569
† Electro Weave, Worcester, MA 01604 617-752-8932
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Love Controls Corp., Wheeling, IL 60090 312-541-3232
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Markel Corp., Norristown, PA 19404 215-272-8960
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100

Cable, Transmission Line, Power-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1843
Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1918
† Adams-Russell Electronics Co., Inc., Amesbury, MA 01913 508-388-5210
Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chabin Corp., Chico, CA 95926 916-891-6410
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Precision Tube, N. Wales, PA 19454 215-699-5801
§ Remee Products Corp., Florida, NY 10921 914-651-4431
Storm Products Co., Hinsdale, IL 60521 312-323-9121
Temp-Flex Cable, Inc., S. Grafton, MA 01560 508-839-5987
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100

Cable, Triaxial-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1843
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... C•1859
L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1782
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1868
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1917
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517,1519,1922
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chabin Corp., Chico, CA 95926 916-891-6410
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† Independent Cable, Inc., Hudson, MA 01749 617-562-9913
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
† Plastoid Corporation, Hamburg, NJ 07419 201-827-7141

Precision Tube, N. Wales, PA 19454 215-699-5801
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

Cable, TV (Incl. Camera)-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831,1836-1837
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1844
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ..... C•1386
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ..... C•1921
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§† Microwave Systems Inc., Syracuse, NY 13211-2100 315-437-9951
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Plastoid Corporation, Hamburg, NJ 07419 201-827-7141
§ Remee Products Corp., Florida, NY 10921 914-651-4431
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
Wavetek RF Products, Inc., (Formerly Wavetek Indiana, Inc.), Indianapolis, IN 46203 317-787-3332
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1765
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. D•1078
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1821,1823,1825
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ... C•1299
§ Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1831-1832,1835
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1840-1841,1845-1846
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850
Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... C•1859
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1860
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ..... C•1864
L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1782
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886,1890,1892,1895-1896,1901-1902
Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1925
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1932-1935,1937-1941,1944-1946,1952
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§† Baron Wire & Cable, Skokie, IL 60076 312-677-5000
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§† Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ Independent Cable, Inc., Hudson, MA 01749 617-562-9913
§† Judd Wire Inc., Turners Falls, MA 01376 413-863-4357
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Kelly American, Inc., Brookfield, CT 06804 203-775-2590
§ Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§† Markel Corp., Norristown, PA 19404 215-272-8960
§† Microtech, Boothwyn, PA 19061 215-459-3566
Molecu-Wire, Farmingdale, NJ 07727 201-938-9473
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Oflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
Precision Interconnect, Portland, OR 97224 503-620-9400
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 914-429-3103
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
§ Wilco Wire & Cable Co., Inc., San Jose, CA 95133 408-926-8880
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1860-1862
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1743
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
§† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
§† Berk-Tek Inc., New Holland, PA 17557 717-354-6200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
† Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Electro Weave, Worcester, MA 01604 617-752-8932
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800

§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1762
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1767
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1275
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1829
Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1301,1303
Comm/Scope, Inc., Network Cable Div., Hickory, NC 28603, 704-324-2200;800-982-1708 ..... C•1833
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312-1313,1617
† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† General Devices Co., Inc., Indianapolis, IN 46239-9632, 317-897-7000 ... C•1056
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1860-1862
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ..... C•1392-1393
† LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
† Litton Poly-Scientific, Div. of Litton Industries, Blacksburg, VA 24060-3100, 703-953-4751 ..... B•1269-1270,1276
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1417,1420-1421,1870-1871
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1908-1909
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ... C•1470,1910
Phoenix Wire, Inc., S. Hero, VT 05486, 802-372-4561 ..... C•1915
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1916
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1919
§† Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO, 519-696-2616 ..... C•1087
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517-1519
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1526,1921
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
§ U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503, 213-316-9984 ..... C•1087
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
† Accurate Electronics, Elyria, OH 44036 216-366-6330
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
Advanced Techn. Research Labs., Alexandria, VA 22312 703-750-2920
§† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
† Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
† Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Altek Co., Torrington, CT 06790 203-482-7626
† Altron, Inc., Anoka, MN 55303 612-427-7735
Amerex, Riverside, CA 92516 714-686-1400
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
Andrew Corp., Orland Pk., IL 60462 800-255-1479
§† Antex Division, Marblehead, MA 01945 617-631-7100
† Applied Engineering Products, New Haven, CT 06525 203-387-5282
† Apsco, Inc., Mentor, OH 44060 216-352-8961
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Automation Elctrns., R.J.A. Inds., Inc., Chatsworth, CA 91311 818-998-5124
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
Babcock Display Products, Inc., A Subsidiary of Babcock, Inc., Anaheim, CA 92805 714-491-5121
† Basic Electronics, Inc., Stanton, CA 90680 714-530-2400
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Bibco, Inc., Benton Harbor, MI 49022 616-925-8445
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Branmag, Inc., North Tonawanda, NY 14120 716-693-5994
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Burton Electrical Engineering, Wyle Laboratories, El Segundo, CA 90245-0217 213-772-1406
† Cable Systems, Inc., Everett, MA 02149 617-389-7080
Cabletest Products Co., Melrose, MA 02176 617-665-2932
§ Cablex, Inc., Englewood, CO 80112 303-792-5760
† CAD Engrg. & Assembly Inc., Mentor, OH 44060 216-255-7744
CAL-AV, Inc., Campbell, CA 95008 408-371-0666
Capulum Cable Technology, Ltd., Nepean, Ontario, CANADA K2H 9C1 .. 613-726-1966
† Cardinal Control Co., Kensington, CT 06037 203-828-6379
† Caribbean Assemblies, Inc., Casselberry, FL 32708 407-327-0602
† C.E. Precision Assemblies, Inc., Chandler, AZ 85226 602-940-0740
Chabin Corp., Chico, CA 95926 916-891-6410
Chenango Industries, Inc., Vestal, NY 13850 607-748-1572
Chloride Power Electronics, El Paso, TX 79935 915-592-9985
† CICOIL CORP., Valencia, CA 91355-3428 805-295-1295
† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Coaxitube Corp., Salisbury, MD 21801 301-546-3911
Communication Devices, Inc., Scarborough, Ont., CAN M1H3A4 416-439-6320
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
† Corlund Electronics Corp., Newbury Park, CA 91320 805-499-6877
Cross Electronics, Warrendale, PA 15086 412-776-1591
† CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
CW Industries, Southhampton, PA 18966 215-355-7080
† Danmar Inds., Chatsworth, CA 91311 ..... 818-882-7979/5280
§ Dataprobe, Englewood, NJ 07631 201-569-6464
† Data Set Cable Co., Inc., Ridgefield, CT 06877 203-438-9684
† De Anza Mfg. & Svcs. Inc., Sunnyvale, CA 94089 408-734-2020
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Diagostic Instrument Corp., Ayer, MA 01432 508-772-4572
Digital Equip., Marlborough, MA 01752
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Dymec Silicon Transistor Corp., Winchester, MA 01890 617-729-7870
† Eastern Electronics Mfg. Corp., National Patent Dev. Corp., East Hartford, CT 06108 203-528-9821
† Electroprep, Inc., Cataumet, MA 02534 617-563-5559
§ Electro Standards Lab., Inc., Providence, RI 02940 401-943-1164
† Electro-Support Systems, Temecula, CA 92390 714-676-2751
† Electro Weave, Worcester, MA 01604 617-752-8932
† E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
Emtronix Corporation, LEM, SA, Geneva Switzerland, Germantown, WI 53022 414-255-2620
† Engine Systems Division, Simmonds Precision, Norwich, NY 13815 607-335-5000
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
Everett/Charles Test Equipment, Inc., Pomona, CA 91767 714-621-9511
Evershed & Vignoles, Ltd., Meggitt Holdings P. L. C., Chiswick, London, ENGLAND W4 5HJ 01-994-3670
§† Excel Specialty Corp., Chicago, IL 60660 312-262-4781
§† E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
Federal Electronics, Cranston, RI 02921 401-944-6200
The Five Star Co., Plantsville, CT 06479 203-628-5561
FLEX-Link Products, Inc., San Fernando, CA 91340 818-898-1451
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Technology Corp., Albuquerque, NM 87109 505-345-5591
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† Grim Corporation, Medford, NJ 08055-0968 609-267-7950
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
† Gulton Industries, Inc., Servonic Div., Costa Mesa, CA 92627 ..... 714-642-2400; 800-854-4066
Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
§† Hollingsead International, Santa Fe Springs, CA 90670 213-921-3438
† Hudson Industries, Hudson, NH 03051 603-880-7712
† Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
§ ICC, Inc., Orange, CA 92665 714-998-8310
§† IEC Electronics, Newark, NY 14513 315-331-7742
§ Illinois Lock Co., The Eastern Co., Wheeling, IL 60090 312-537-1800
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ K & M Electronics, W. Springfield, MA 01089 413-781-1350
§ Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
† Lamtech Electronics, Garland, TX 75042 214-272-3504
§ L-Com Inc., N. Andover, MA 01845 508-682-6936
§† Linemaster Switch, Woodstock, CT 06281 203-974-1000
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
† Mac Panel Co., High Point, NC 27264 919-884-8111
† Manage, Inc., Fibre Optics Elctrns. Sys. Grp., Chicopee, MA 01014 413-592-9123
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
† Maury Microwave Corp., Cucamonga, CA 91730 714-987-4715
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
† Metric Systems, Ft. Walton Beach, Fl. 32548-9990 904-244-9600
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373

† MOLDCON Div. of Contex Electronics, W. Springfield, MA 01089 413-736-0371
† MRL, Missouri Research Labs., St. Charles, MO 63301 .. 314-946-6900;1-800-325-0223
Mueller Elec. Co., Cleveland, OH 44114 216-771-5225
Multi Products International, Cedar Grove, NJ 07009 201-239-8183
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
† National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
† N.E.D. Cable Co., Div. of Electro-Prep, Inc., Salem, MA 01970 617-745-9911
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
† Precision Tube, N. Wales, PA 19454 215-699-5801
† Product Technology, Inc., Irvine, CA 92714 714-474-8998
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pylon Elex Development Co. Ltd., Lachine, PQ, CANADA H8S 1Z3 514-637-1186
Ragen Corp., Systems Div., N. Arlington, NJ 07032 201-997-1000
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Reactel, Inc., Rockville, MD 20850 301-279-5535
Ren Electronics Corporation, C.C.G., An Insico Co., S. Hadley, MA 01075 413-536-1800
§† Revere Corporation of America, Wallingford, CT 06492 203-269-7701
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
§† Rose Enclosures Sys., Inc., Frederick, MD 21701 301-696-9800
† Russtech Engineering Company, Inc., Mission Viejo, CA 92691 714-472-0880
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
SPS Inc. (Muirhead Vactric), Springfield, NJ 07081 201-376-1222
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§† Systron-Donner Microwave Div., Van Nuys, CA 91409 818-786-1760
Techdyne, Inc., Lance Wire & Cable Div., Hamden, CT 06514 203-288-5571
† Tech Laboratories Inc., Palisades Pk., NJ 07650 201-944-2221
Technical Service Laboratory Inc., Ft. Walton Beach, FL 32548 904-243-3722
† Teledyne Aerospace Sys., Fairmont, MN 56031 507-235-3355
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Terminal Data Corp., Rockville, MD 20855 301-921-8282
Tevelec, Ltd., Mississauga, Ontario, CANADA L4W 2W6 416-624-5241
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Time Mark Corp., Tulsa, OK 74116 918-438-1220
Trionics, Inc., St. Charles, IL 60174 312-232-9117
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
† V-Tron Electronics Corp., S. Attleboro, MA 02703 617-761-9100
§ Wall-Able Mfg. Corp., Elk Grove Vl., IL 60007 312-956-8000
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677
† Western Reserve Electronics, Twinsburg, OH 44087 216-425-4951
† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
§† Wilco Wire & Cable Co., Inc., San Jose, CA 95133 408-926-8880
† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651
† Woven Electronics, Woven Electronics Corporation, Simpsonville, SC 29681 803-963-5131
Xylog Corp., Hackensack, NJ 07601 201-489-4040
† Zero Corp., Burbank, CA 90503 818-846-4191
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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Richard-Lee Co., Cranford, NJ 07016 201-276-0710

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Calibrators, Automated-2900 — ***See Vol. D***

Calibrators, Crystal-2900 — ***See Vol. D***

Calibrators, Current-2900 — ***See Vol. D***

Calibrators, Fluxmeter-2900 — ***See Vol. D***

Calibrators, Frequency-2900 — ***See Vol. D***

Calibrators, LVDT-2900 — ***See Vol. D***

Calibrators, Magnetic Field-2900 — ***See Vol. D***

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Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ... C•1077
† American Aluminum, Mountainside, NJ 07092 201-233-3500
Hallmark Metals Inc., Glendora, CA 91740 213-335-1263
† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
Inter-Technical Group Inc., WIMA Div., Elmsford, NY 10523 914-591-8822
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Texas Instrs., Inc., Dallas, TX 75380 ..... 800-232-3200 (ext 700)
† Wall, A. T., Co., Warwick, RI 02886 401-739-0740
† Zero Corp., Burbank, CA 90503 818-846-4191

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Capacitor Hardware-2500

§ Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Mallory Capacitor Co., Emhart Elctrl./Elctrn. Grp., Indianapolis, IN 46241 317-856-3731
§ Sprague Electric Company, Distbn.Div., Mansfield, MA 02048-9102 617-339-8900
§ Sprague Electric Company:The Components Group, Hudson, NH 03051 603-881-7200
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291

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Caps, Connector-2100

Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 .. C•1360
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Dabum Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
International Configurations, Inc., Enfield, CT 06082 203-749-6380
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Penstock Engineering Labs., Penstock, Inc., Sunnyvale, CA 94086-4018 408-730-0300
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§† Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100

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§† Dabum Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§ Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
§† Remtek Corporation, Fremont, CA 94538, 415-490-3999 ..... C•1701
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
AME Corporation, Towaco, NJ 07082-0195 201-263-1700
§ Antex Division, Marblehead, MA 01945 617-631-7100
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§† Conexco International, Jamaica, NY 11432 718-523-4100
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
Markel Corp., Norristown, PA 19404 215-272-8960
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
§ Tegal Scientific, Inc., Concord, CA 94524 415-827-1054
Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842

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AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1382
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815
§ The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... D•2241
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600

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Cabtron Systems, Inc., Northbrook, IL 60062, 312-498-6090 ..... C•1014
Calmark Corp., San Gabriel, CA 91776, 818-287-0451 ..... C•1015
Gemini, Cannon Falls, MN 55009, 507-263-3957;800-533-3631 ..... C•1054-1055
§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
§ Clean Room Prods., Ronkonkoma, NY 11779-6528 516-588-7000
Contact East, N. Andover, MA 01845 508-682-2000
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
† Electronic Enclosures, Div. Wyle Labs, El Segundo, CA 90245 213-643-8181
§† E-Tronics, Sepulveda, CA 91343 818-892-7279
§ Ferno-Salesmaker, Ferno-Washington, Inc., Wilmington, OH 45177 513-382-1451
John Fluke Mfg. Co., Inc., Everett, Wa 98206, WA 98206 206-356-5400
§ Hodge Manufacturing Co., Inc., Springfield, MA 01107 413-781-6800
Inter Metro Industries Corp., Wilkes-Barre, PA 18705 717-825-2741
Kikusui International Corp., Torrance, CA 90503 ..... 213-371-4662;800-545-8784
§ Leader Instruments Corp., Hauppauge, NY 11788-3694 516-231-6900
§ Lyon Metal Products, Aurora, IL 60507 312-892-8941
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mobile-Tronics Co., Inc., Tustin, CA 92680 714-546-0884
Parsons Manufacturing, Menlo Park, CA 94025-1476 415-324-4726
Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771 ..... 914-856-6655; 800-428-CASE
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
§ Sunshine Scientific Instruments, Philadelphia, PA 19115 215-673-5600
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Terminal Data Corp., Rockville, MD 20855 301-921-8282
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
† Zero Corp., Burbank, CA 90503 818-846-4191

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Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ..... C•1040-1044,1046-1047
Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062
§ Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... C•1082
Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1084
† Albion Industries, Albion, MI 49224 517-629-9441
§ Casemaker, Stebco Industries, Inc., Chicago, IL 60609 312-254-1221
† ECS Composites, Grants Pass, OR 97526 503-476-8871
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Emcor Products, Crenlo, Inc., Rochester, MN 55901 507-289-3371
Inter Metro Industries Corp., Wilkes-Barre, PA 18705 717-825-2741
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150 312-350-8200
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900

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Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1743
§ Walker Scientific, Worcester, MA 01606, 508-852-3674;508-853-3232 .... D•1372
† Ad-Vance Magnetics, Inc., Rochester, IN 46975 219-223-3158
† MuShield Products, Div. Bomco Inc., Gloucester, MA 01930 508-283-9000
† Power Sys. Grp., Rantec Div., Emerson Elec. Co., Chatsworth, CA 91311 818-885-8223

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Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1035
Ango Electronics Corp., Harrison, NJ 07029, 201-484-1115 ..... C•1010
§ Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
† Compac, Holbrook, NY 11741, 516-585-3400 ..... C•1016-1019
§ Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1028-1030
Electro Space Fabricators, Topton, PA 19562-0067, 215-682-7181 ..... C•1031,1033-1034
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... D•1120-1121
Lansing Instruments Corp., Ithaca, NY 14858-0730, 607-272-3265;607-257-7613;800-847-3535 ..... C•1059
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401, 508-588-6110 ..... C•1060-1061,1716-1717
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062,1065
POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ... C•1077
Powerbox Inc., Boulder, CO 80302, 303-444-1461;800-444-1461 ..... C•1078
§ Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... C•1080,1082
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Scanbe, Unit of Zero Corporation, El Monte, CA 91731, 818-579-2300 ... C•1089
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... C•1091
† STRONGBOX, Culver City, CA 90231-2726, 213-305-8288 ..... C•1100-1101
TDJ Co., Inc., San Diego, CA 92110, 619-276-5920 ..... C•1102-1103
† Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1105-1109
Unitrack Industries, Inc., West Chester, PA 19380, 215-692-0800 ..... C•1116
§ Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1722, 1727-1728
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1122-1123
Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
ADAC Corp., Woburn, MA 01801 617-935-6668
§ Amerex, Riverside, CA 92516 714-686-1400
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
Augat Inc., Attleboro, MA 02703 617-222-2202
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
† Calmark Corp., San Gabriel, CA 91776 818-287-0451
† Contours Inc., Meriden, CT 06450 203-237-8331
Douglas Electronics, San Leandro, CA 94577 415-483-8770
† EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
† Electrorack Products Co., Anaheim, CA 92806 714-776-5420
Emcor Products, Crenlo, Inc., Rochester, MN 55901 507-289-3371
§† E-Tronics, Sepulveda, CA 91343 818-892-7279
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
† Hamilton Metalcraft, Pasadena, CA 91103 818-795-4811
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
Pacific Microcomputers, Signal Technology, San Diego, CA 92121 619-453-8649
Prototek, Inc., Hamilton, OH 45015 513-874-5094
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
Zendex Corp., Dublin, CA 94568 415-828-3000

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Ango Electronics Corp., Harrison, NJ 07029, 201-484-1115 ..... C•1010
§ Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
§ Compac, Holbrook, NY 11741, 516-585-3400 ..... C•1016-1019
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268, 818-442-2572 ..... C•1024
Electro Space Fabricators, Topton, PA 19562-0067, 215-682-7181 .. C•1033-1034
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... D•1120-1121
† General Devices Co., Inc., Indianapolis, IN 46239-9632, 317-897-7000 ... C•1056
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Lansing Instruments Corp., Ithaca, NY 14858-0730, 607-272-3265;607-257-7613;800-847-3535 ..... C•1059
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062,1065
Powerbox Inc., Boulder, CO 80302, 303-444-1461;800-444-1461 ..... C•1078
§ Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... C•1082
§† Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1085
† STRONGBOX, Culver City, CA 90231-2726, 213-305-8288 ..... C•1100-1101
† Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1105-1109
Unitrack Industries, Inc., West Chester, PA 19380, 215-692-0800 ..... C•1116
Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1122-1123
† Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
§ AAK Corp, Haverhill, MA 01832 508-373-3769
§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
† Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
Alden Products Co., Brockton, MA 02403 508-583-0160
† American Aluminum, Mountainside, NJ 07092 201-233-3500
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
Bit 3 Computer Corporation, Minneapolis, MN 55431-1393 612-881-6955
Boker's, Inc., Minneapolis, MN 55406-1937 612-729-9365
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
† Calmark Corp., San Gabriel, CA 91776 818-287-0451
† Churchill Corp., Melrose, MA 02176 617-665-4700
† Contours Inc., Meriden, CT 06450 203-237-8331
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ GENROCO, Inc., Slinger, WI 53086-9407 414-644-8700
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
Hallmark Metals Inc., Glendora, CA 91740 213-335-1263
† Hamilton Metalcraft, Pasadena, CA 91103 818-795-4811
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
§ Heeger, Inc., Los Angeles, CA 90023 ..... 213-261-0382;213-261-0383
Hudson Industries, Hudson, NH 03051 603-880-7712
§ LMB Heeger, Inc., Los Angeles, CA 90023 213-261-0382
Matrix Corp., Raleigh, NC 27610 919-833-2000
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455

MRL, Missouri Research Labs., St. Charles, MO 63301 .. 314-946-6900;1-800-325-0223
Prototek, Inc., Hamilton, OH 45015 513-874-5094
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Suckle Corp., Scranton, PA 18505 717-346-3871
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
TDJ Co., Inc., San Diego, CA 92110 619-276-5920
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
† Trilobyte Computer Corporation, San Leandro, CA 94577 415-895-1100
§ U.S. Power Converting Company/Reico, Leonard V. Snow & Assocs., Torrance, CA 90503 213-316-9984
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
Zendex Corp., Dublin, CA 94568 415-828-3000
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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Chemicals, Electroplating-1600

† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
Auric Corp., Newark, NJ 07114 201-242-4100
§† Automated Prod. Equip. Corp., Medford, NY 11763 516-654-1197
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Fidelity Chemical Products Corp., Newark, NJ 07114 201-242-4110
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Chemical Corporation, Pittsburg, CA 94565 415-685-1450
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
§ Instant Board Circuits Grp., Novato, CA 94949 415-883-1717
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
Pace Inc., Laurel, MD 20707 301-490-9860
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
Sel-Rex Div., OMI Intl. Corp., Nutley, NJ 07110 201-667-5200
† Technic, Inc., Providence, RI 02901 401-781-6100
Transene, Rowley, MA 01969 508-948-2501

Chemicals, Epoxy Stripping-1600

§ Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
§ Epoxylite Corp., Irvine, CA 92713 714-951-3231
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Hardman Inc., Belleville, NJ 07109 201-751-3000
† Master Bond, Hackensack, NJ 07601 201-343-8983
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
† Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
† Sigma Plastronics, Inc., Whitmore Lake, MI 48189 313-231-2871

Chemicals, Etching-1700

§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ..... C•1726
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
Auric Corp., Newark, NJ 07114 201-242-4100
† DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Fidelity Chemical Products Corp., Newark, NJ 07114 201-242-4110
† FMC Corporation, Chemical Products Grp., Philadelphia, PA 19103 215-299-6000
§ Gates, Geo. W., & Co., Inc., Franklin Sq., NY 11010 516-352-2904
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Chemical Corporation, Pittsburg, CA 94565 415-685-1450
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
Micro-Etch Products, Inc., Stratford, CT 06497 203-378-8610
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
† Technic, Inc., Providence, RI 02901 401-781-6100
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501

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Chemicals, Tin Plating-1700

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§ Instant Board Circuits Grp., Novato, CA 94949 415-883-1717
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
† Technic, Inc., Providence, RI 02901 401-781-6100

Chemicals, Wire Stripping-1600

§ Eraser Co., Syracuse, NY 13221 315-454-3237
Fidelity Chemical Products Corp., Newark, NJ 07114 201-242-4110
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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Chip Carriers, Surface Mount-2500

† International Sensor Systems, Inc., Aurora, NE 68818, 402-694-6111 ..... A•1748-1749
† Mini-Systems, Inc., Electronic Package Div., Plainville, MA 02762, 508-695-2000 ..... A•1752
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. C•1463, D•2241
Ohmtek Inc., Vishay, Niagara Falls, NY 14304, 716-283-4025 ..... A•2024-2025
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Dale Electronics, Inc., El Paso Div., El Paso, TX 79926-6728 915-592-3253
§ Dale Electronics, Inc., Norfolk Div., Norfolk, NE 68701-2242 402-371-0080
† Densepac Microsystems, Inc., Garden Grove, CA 92641-1428 ..... 714-898-0007; 800-64-CHIPS
§ International Resistive Company, Boone, NC 28607 704-264-8861
K-Two Industries, Palo Alto, CA 94306 408-720-9316
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
Philips Circuit Assemblies, Tampa, FL 33684 813-933-5113
Powerex, Westinghouse, GE, Mitsubishi, Youngwood, PA 15697 412-925-7272
Solitron Devices, Inc., Semiconductor Group, Riviera Beach, FL 33404-9978 407-848-4311

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ACC Electronics Company, Echlin Inc., Independence, KS 67301, 316-331-1000 ..... A•1736
Inland Motor/Kollmorgen, Sierra Vista, AZ 85635, 602-459-1150 ..... B•1265
§ Action Instruments, San Diego, CA 92123 619-279-5726
† Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
AMP, Harrisburg, PA 17105 717-564-0100
Audichron, Atlanta, GA 30340-2178 404-455-4892
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Basic Electronics, Inc., Stanton, CA 90680 714-530-2400
† Boeing Electronics, Seattle, WA 98124-6269 206-657-7474
Colt Technology Corp., Lenexa, KS 66219 913-888-1673
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
DOW SWITCH, Wilmington, MA 01887 617-935-6395
† Eldre Corporation, Rochester, NY 14623 716-427-7280
§† Electrofilm, Valencia, CA 91355 805-257-2240
† FLEX-Link Products, Inc., San Fernando, CA 91340 818-898-1451
† General Technology Corp., Albuquerque, NM 87109 505-345-5591
GTI/Circuits Div., Leesburg, IN 46538 219-453-3261
Hi-Tech Components, Mitsubishi International Corp., New York, NY 10022 212-605-2607
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hughes Electronics Products Corp., Livonia, MI 48150 313-427-8310
Intaq Electrotouch Sys., GM Nameplate, Inc., Seattle, WA 98119 206-284-5475
ITL Circuits, Markham, Ontario, CANADA L3R 1C4 ..... 416-475-6658;416-492-9307
Jayco Plastics of California, Inc., Orange, CA 92665 714-974-1701
Mantex Corp., Oxford, MI 48051 313-628-8200
† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Minco Products, Minneapolis, MN 55432 612-571-3121
Noble U.S.A., Inc., Rolling Meadows, IL 60008 312-364-6038
OMNI Switch USA, Inc., Phoenix, AZ 85027 602-582-0629
Philips Circuit Assemblies:A Division of North American Philips Corp., Milwaukee, WI 53209 414-228-7632
Philips Circuit Assemblies, Tampa, FL 33684 813-933-5113

Philips Circuit Assemblies:North American Philips Corp., Hopkins, MN 55343 612-933-4600
† Poly Circuits, Inc., Bensenville, IL 60106 312-860-3560
† Precision Graphics Inc., Raritan, NJ 08869 201-707-8880
Rogers Corporation, Circuit Materials Div., Chandler, AZ 85244 602-963-4584
† Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
Rogers Corp., Rogers, CT 06263 203-774-9605
Sanders Associates, Inc., ECBD, A Lockheed Company, Manchester, NH 03108-8500 603-645-5548
† Sheldahl, Inc., Northfield, MN 55057 507-663-8000
† Tech-Etch, Inc., Plymouth, MA 02360 508-747-0300
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
† Thermolab, N. Hollywood, CA 91605 818-787-4084

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Cherry Electrical Products, Cherry Corporation, Waukegan, IL 60087, 312-360-3500 ..... B•1052
International Sensor Systems, Inc., Aurora, NE 68818, 402-694-6111 .... A•1748
Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1727
§ Action Instruments, San Diego, CA 92123 619-279-5726
Additive Products Div., Kollmorgen Corp., Aquebogue, NY 11931 516-722-4100
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
Audichron, Atlanta, GA 30340-2178 404-455-4892
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Aydin Corp., Horsham, PA 19044 215-657-7510
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† Collins Avionics Divisions, Rockwell Intl, Cedar Rapids, IA 52498 319-395-1000
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† CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
† Cuplex, Inc., Garland, TX 75040 214-276-0333
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§ Data-Design Labs., Cucamonga, CA 91730 714-987-2511
DOW SWITCH, Wilmington, MA 01887 617-935-6395
† Electronic Controls Design, Mulino, OR 97042 503-829-9108
Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
† Fema Elctrns. Corp., E. Brunswick, NJ 08816 201-238-1223
† Force, Inc., Christiansburg, VA 24073 703-382-0462
† General Technology Corp., Albuquerque, NM 87109 505-345-5591
GTE Products, Circuit Board Operation, Muncy, PA 17756 717-546-3191
Hi-Tech Components, Mitsubishi International Corp., New York, NY 10022 212-605-2607
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Hughes Electronics Products Corp., Livonia, MI 48150 313-427-8310
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† ITL Circuits, Markham, Ontario, CANADA L3R 1C4 ..... 416-475-6658;416-492-9307
† Kalmus & Assocs., Inc., Broadview, IL 60153 312-343-7004
† Lockheed Electronics Co., Inc., Lockheed Corporation, Plainfield, NJ 07061 201-757-1600
† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
† Micropac Inds., Inc., General Sensors Div., Garland, TX 75040 214-272-3571
† Multiwire Division, Kollmorgen Corp., Hicksville, NY 11801 516-933-8300
† Natel Engineering Co., Inc., Simi Valley, CA 93063 805-581-3950
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Philips Circuit Assemblies, Tampa, FL 33684 813-933-5113
Philips Circuit Assemblies:North American Philips Corp., Hopkins, MN 55343 612-933-4600
Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
† Pho-Tronics Div., E. R. Wagner Mfg. Co., Milwaukee, WI 53224 414-355-6704
† Poly Circuits, Inc., Bensenville, IL 60106 312-860-3560
† Precision Graphics Inc., Raritan, NJ 08869 201-707-8880
Ragen Corp., Systems Div., N. Arlington, NJ 07032 201-997-1000
Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO 519-696-2616
† Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
† Rogers Corporation, Soladyne Div., San Diego, CA 92111 619-279-7872
Rogers Corp., Rogers, CT 06263 203-774-9605
Sanders Associates, Inc., ECBD, A Lockheed Company, Manchester, NH 03108-8500 603-645-5548
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Stetron International, Inc., Buffalo, NY 14203 716-854-3443
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
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§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trend Circuits, Fremont, CA 94536 415-651-1150
Truline Corporation, Visalia, CA 93279-1469 209-747-1261
Urban Electronics, Dover, MA 02030 617-329-4068
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Cherry Electrical Products, Cherry Corporation, Waukegan, IL 60087, 312-360-3500 ..... B•1052
Gordos, A Flint Industries Company, Rogers, AR. 72757, AR 72757, 501-636-5000 ..... D•1180-1181
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
§† Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... C•1727
† Vector Electronic Co., Sylmar, CA 91342, 818-365-9661 ..... D•1122-1123
Accurate Electronics, Elyria, OH 44036 216-366-6330
Additive Products Div., Kollmorgen Corp., Aquebogue, NY 11931 516-722-4100
† Airtron, Litton Industries, Inc., Morris Plains, NJ 07950 201-539-5500
A-Systems Inc., Charlottesville, VA 22901 804-295-7200
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
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Benchmark Technology, City of Industry, CA 91745 818-333-1201
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
† Boeing Electronics, Seattle, WA 98124-6269 206-657-7474
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Compac, Holbrook, NY 11741 516-585-3400
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
Coreco, Inc., St. Laurent, Que., CANADA H4T 1V8 ..... 800-361-4914;514-333-1301
† CTS Corporation, Elkhart, IN 46514 219-293-7511
CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
† Cuplex, Inc., Garland, TX 75040 214-276-0333
Data Capture Technology, Hathaway Corp., Tulsa, OK 74116 918-438-5366
Data Circuits, Computer Logics Ltd., Mississauga, Ont., CANADA L4V 1H3 416-672-3833
Data I/O Corp., Redmond, WA 98073-9746 206-881-6444
Douglas Electronics, San Leandro, CA 94577 415-483-8770
† Dynacircuits Inc., Franklin Park, IL 60131 312-451-1700
† Eastern Electronics Mfg. Corp., National Patent Dev. Corp., East Hartford, CT 06108 203-528-9821
† Electronic Controls Design, Mulino, OR 97042 503-829-9108
Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
† EMDS, Inc., Gaithersburg, MD 20877 301-840-5710
† Fema Elctrns. Corp., E. Brunswick, NJ 08816 201-238-1223
† Force, Inc., Christiansburg, VA 24073 703-382-0462
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† General Technology Corp., Albuquerque, NM 87109 505-345-5591
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IM/D Corp., Manchester, NH 03101 603-669-5224
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§ Integrity Technology, Milpitas, CA 95035 408-262-8640
† ITL Circuits, Markham, Ontario, CANADA L3R 1C4 ..... 416-475-6658;416-492-9307
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§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Lockheed Electronics Co., Inc., Lockheed Corporation, Plainfield, NJ 07061 201-757-1600
McCoy Electronics Co., A Sub. of Oak Industries, Mt. Holly Springs, PA 17065 717-486-3411
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† Modular Systems, Inc., Charlottesville, VA 22901 804-295-7882
† National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
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§† Pacific Coast Circuits, Inc., San Luis Obispo, CA 93401 805-544-4881
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
Philips Circuit Assemblies:A Division of North American Philips Corp., Milwaukee, WI 53209 414-228-7632
Philips Circuit Assemblies, Tampa, FL 33684 813-933-5113
Philips Circuit Assemblies:North American Philips Corp., Hopkins, MN 55343 612-933-4600
Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
† Photocircuits Glen Cove, Div., Kollmorgen Corp., Glen Cove, NY 11542 516-674-1303
† Pho-Tronics Div., E. R. Wagner Mfg. Co., Milwaukee, WI 53224 414-355-6704
§ Pioneer Components, Brooklyn, NY 11234 718-444-3880
† Poly Circuits, Inc., Bensenville, IL 60106 312-860-3560
† Precision Graphics Inc., Raritan, NJ 08869 201-707-8880
Ragen Corp., Systems Div., N. Arlington, NJ 07032 201-997-1000
Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO 519-696-2616
† Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
† Rogers Corporation, Soladyne Div., San Diego, CA 92111 619-279-7872
Rogers Corp., Rogers, CT 06263 203-774-9605
Sanders Associates, Inc., ECBD, A Lockheed Company, Manchester, NH 03108-8500 603-645-5548
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
SFE Technologies, San Fernando, CA 91340 818-365-9411
† Sheldahl, Inc., Northfield, MN 55057 507-663-8000
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Signatron, A Unit of Sundstrand Corp., Lexington, MA 02173 617-861-1500
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Stetron International, Inc., Buffalo, NY 14203 716-854-3443

§† Techniques, Inc., Englewood, NJ 07631 201-569-5900
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
Teledyne/Geotech, Garland, TX 75041 214-271-2561
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trend Circuits, Fremont, CA 94536 415-651-1150
Truline Corporation, Visalia, CA 93279-1469 209-747-1261
Urban Electronics, Dover, MA 02030 617-329-4068
§ U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503 213-316-9984
Zero Corp., Burbank, CA 90503 818-846-4191

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§† All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1148,1150
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268, 818-442-2572 ..... C•1025
§† Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452-1455
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1908-1909
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
§ Air Electro Inc., Van Nuys, CA 91406 ..... 213-873-6400;818-988-4400
† Alinabal, Milford, CT 06460 203-877-3241
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
AMP, Harrisburg, PA 17105 717-564-0100
§† Amrad & Transcon Mfg. Co., Div. of D.J. Assocs., Inc., Fort Smith, AR 72903-7045 501-452-3987
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† DEK Inc., St. Charles, IL 60174 312-377-2575
§† Dennison Mfg. Co., Framingham, MA 01701 617-879-0511
§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
† Electro-Support Systems, Temecula, CA 92390 714-676-2751
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Globe Plastics, Pomona, CA 91766 714-623-2747
† Hartwell Corp., Placentia, CA 92670 714-993-4200
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Micro Plastics Inc., Flippin, AR 72634 501-453-2261
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
† Nylon Molding Corp., Monrovia, CA 91016 818-358-2305
Parker Hannifin Corp., Cleveland, OH 44112-1290 216-531-3000
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Square D Co., Palatine, IL 60067 312-397-2600
§† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§† Vemaline Prods. Div., Warwick, RI 02887 401-739-7600

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§ AAVID Engineering, Inc., Laconia, NH 03247-0400, 603-528-3400 ... C•1634-1639
§† Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... B•1354, C•1732
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268, 818-442-2572 ..... C•1024
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1350,1352
§† FIC Corp., Rockville, MD 20852, 301-881-8124;800-638-6594 ..... B•1367
Industrial Devices, Inc., Hackensack, NJ 07601, 201-489-8989 ..... B•1158
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452,1454-1455
§† Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
Accurate Electronics, Elyria, OH 44036 216-366-6330
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
§† DEK Inc., St. Charles, IL 60174 312-377-2575
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Grayhill Inc., La Grange, IL 60525 708-354-1040
† Hartwell Corp., Placentia, CA 92670 714-993-4200
§† Heyco Molded Products, Inc., Kenilworth, NJ 07033 ..... 201-245-0033;800-526-4182
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ IERC, Burbank, CA 91502 213-849-2481
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Micro Instrument Company, Escondido, CA 92025 619-746-2010
† Micro-Mounting Devices, Campbell, CA 95008 408-866-4626
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
Stimpson Company, Inc., Bayport, NY 11705-1097 516-472-2000
§ Thermalloy, Inc., Dallas, TX 75381-0839 214-243-4321
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130

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Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452
Accurate Electronics, Elyria, OH 44036 216-366-6330
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Electro-Support Systems, Temecula, CA 92390 714-676-2751
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Micro-Mounting Devices, Campbell, CA 95008 408-866-4626
† Nylon Molding Corp., Monrovia, CA 91016 818-358-2305
† Omega Precision Corp., Cedar Grove, NJ 07009 201-256-3422
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Square D Co., Palatine, IL 60067 312-397-2600
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

Clamps, Synchro & Servo-2500

Alpha-Tech Inc., Riverdale, NJ 07457 201-831-1222
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Timber-Top, Watertown, CT 06795 203-274-6706
† Vernitron Controls, Vernitron Corporation, San Diego, CA 92073 619-428-5581

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Cleaners, Magnetic Medium-1600

Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
Recortec, Inc., Sunnyvale, CA 94086 408-737-8441

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§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
† Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
§ Allen Co., Inc., Robert G., N. Hollywood, CA 91605 ..... 818-765-8300; 800-999-3711
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
Auric Corp., Newark, NJ 07114 201-242-4100
§† Automated Prod. Equip. Corp., Medford, NY 11763 516-654-1197
§† Caig Labs., Escondido, CA 92025 619-743-7143
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
§ Clean Room Prods., Ronkonkoma, NY 11779-6528 516-588-7000
Contact East, N. Andover, MA 01845 508-682-2000
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
§ Electronic Controls Design, Mulino, OR 97042 503-829-9108
§ Eraser Co., Syracuse, NY 13221 315-454-3237
Fidelity Chemical Products Corp., Newark, NJ 07114 201-242-4110
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§† Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Chemical Corporation, Pittsburg, CA 94565 415-685-1450

§ Heat System, Inc., Farmingdale, NY 11735 516-694-9555
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Kester Solder Div., Litton Sys., Inc., Des Plaines, IL 60018 312-297-1600
§ L & R Mfg. Co., Kearny, NJ 07032 201-991-5330
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
† Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
§† Multicore Solders, Westbury, NY 11590 516-334-7997
† Odell, M. P., Co., Hoffman Estates, IL 60195 312-991-2828
§ Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
PTS Corporation, Bloomington, IN 47401 812-824-9331
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
§ Screen Data Corp., Dover, NJ 07801 ..... 201-887-7713;800-248-1212
Sel-Rex Div., OMI Intl. Corp., Nutley, NJ 07110 201-667-5200
Shogyo International Corp., Great Neck, NY 11021 516-466-0911
† Sigma Plastronics, Inc., Whitmore Lake, MI 48189 313-231-2871
§† Sonicor Instrument Corp., Copiague, NY 11726 516-842-3344
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Tegal Scientific, Inc., Concord, CA 94524 415-827-1054
Transene, Rowley, MA 01969 508-948-2501

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§ Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103 ..... C•1308
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313,1617
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§ Industrial Devices, Inc., Hackensack, NJ 07601, 201-489-8989 ..... B•1158
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452,1455
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§ John Fluke Mfg. Co., Inc., Everett, Wa 98206, WA 98206 206-356-5400
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
Multi-Amp Corp., TBG, Dallas, TX 75237 214-333-3201
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Vaco Products, Chicago, IL 60645 312-677-9500

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§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452-1453
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ..... C•1525,1527,1920, D•1527
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
§† Atlee Inc., North Andover, MA 01845 508-681-1003
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Mircoelectronics, Arlington, TX 76003 817-561-2244
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Stimpson Company, Inc., Bayport, NY 11705-1097 516-472-2000

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Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1351-1352
Siemens Components, Inc., Special Products Div., Iselin, NJ 08830, 201-321-3400 ..... A•1331
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Sjoberg, C, & Son, Inc., Cranston, RI 02910 401-461-8220
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600

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Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452-1455
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§ Grayhill Inc., La Grange, IL 60525 708-354-1040
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

Clips, Fahnestock-2100

§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150 312-350-8200

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§ Components Corp., Denville, NJ 07834, 201-627-0290 ..... C•1311
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312-1313
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1350,1352
§ Grayhill Inc., La Grange, IL 60525, 708-354-1040 ..... C•1371
§ Industrial Devices, Inc., Hackensack, NJ 07601, 201-489-8989 ..... B•1158
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1452-1455,1457
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
§ Augat Inc., Attleboro, MA 02703 617-222-2202
§ Contact, Inc., Hudson, NH 03051 603-883-7708
Electro Scientific Industries, Inc. (ESI), Portland, OR 97229 503-641-4141
Everett/Charles Test Equipment, Inc., Pomona, CA 91767 714-621-9511
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Micro Electronic Systems, Inc., Brookfield, CT 06804 ..... 203-775-1440;800-243-7254
† Micro Instrument Company, Escondido, CA 92025 619-746-2010
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
Multi-Amp Corp., TBG, Dallas, TX 75237 214-333-3201
National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
† Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242-2243
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
§† ACL Inc., Elk Grove, IL 60007 ..... 312-981-9212;800-STATIC-0
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
† Evaporated Coatings, Inc., Willow Grove, PA 19090 215-659-3080
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
† Libbey-Owens-Ford Co., Liberty Mirror Products, Brackenridge, PA 15014 412-224-1800
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Master Bond, Hackensack, NJ 07601 201-343-8983
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242

Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
† Optical & Conductive Coatings, Meridian Inds., Inc., Pacheco, CA 94553 415-798-6066
§ Simco Co., Hatfield, PA 19440 215-822-2171
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
§† Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Coatings, Compounds, Lubricants, etc., Heat Conductive-1600

Power Devices Inc., Laguna Hills, CA 92653, 714-582-6712 ..... C•1699
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
The Cool-Amp Conducto-Lube Co., Portland, OR 97219 503-244-2230
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§ Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
† IERC, Burbank, CA 91502 213-849-2481
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
† Master Bond, Hackensack, NJ 07601 201-343-8983
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
§† Multicore Solders, Westbury, NY 11590 516-334-7997
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
§† Tafa, Inc., Concord, NH 03301 603-224-9585
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
Transene, Rowley, MA 01969 508-948-2501

Coatings, Conductive, Electric-1600

† Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
Power Devices Inc., Laguna Hills, CA 92653, 714-582-6712 ..... C•1699
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242-2243
† Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
† Balzers Optical Corporation, Marlboro, MA 01752 617-481-9860
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
§ Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
The Cool-Amp Conducto-Lube Co., Portland, OR 97219 503-244-2230
† DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
Electro-Science Labs., Inc., King of Prussia, PA 19406-1533 215-272-8000
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
† Evaporated Coatings, Inc., Willow Grove, PA 19090 215-659-3080
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
† Libbey-Owens-Ford Co., Liberty Mirror Products, Brackenridge, PA 15014 412-224-1800
† Master Bond, Hackensack, NJ 07601 201-343-8983
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
† Optical & Conductive Coatings, Meridian Inds., Inc., Pacheco, CA 94553 415-798-6066
† Orcus, Kansas City, MO 64112 913-897-5128
Sel-Rex Div., OMI Intl. Corp., Nutley, NJ 07110 201-667-5200
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§† Tafa, Inc., Concord, NH 03301 603-224-9585
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501
§† Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

Coatings, Corrosion Resistant-1600

§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
† Alpha Industries, Inc., Woburn, MA 01801 617-935-5150
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
§† Caig Labs., Escondido, CA 92025 619-743-7143
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
Conap, Inc., Olean, NY 14760 716-372-9650
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
The Cool-Amp Conducto-Lube Co., Portland, OR 97219 503-244-2230
† Cotronics, Brooklyn, NY 11235 718-646-7996
§ Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
§† Epoxylite Corp., Irvine, CA 92713 714-951-3231
Ferro Corporation, Frit Division, Cleveland, OH 44101 216-641-8580
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Hardman Inc., Belleville, NJ 07109 201-751-3000
HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
† IERC, Burbank, CA 91502 213-849-2481
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
Lancer Chemical, Warren, RI 02885 401-245-5493
† Master Bond, Hackensack, NJ 07601 201-343-8983
§† Multicore Solders, Westbury, NY 11590 516-334-7997
† Nova Tran, Union Carbide Corp., Clear Lake, WI 54005 800-554-1697
Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
§† Tafa, Inc., Concord, NH 03301 603-224-9585
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
Transene, Rowley, MA 01969 508-948-2501

Coatings, Electromagnetic Wave Absorbing-1600

† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Dontech, Inc., Doylestown, PA 18901 215-348-5010
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
† Evaporated Coatings, Inc., Willow Grove, PA 19090 215-659-3080
§ Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
† Libbey-Owens-Ford Co., Liberty Mirror Products, Brackenridge, PA 15014 412-224-1800
† Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
§† Tafa, Inc., Concord, NH 03301 603-224-9585
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500

Coatings, Fungicidal-1600

§† Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
† Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
† Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
§† Tafa, Inc., Concord, NH 03301 603-224-9585
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Tech Spray, Inc., Amarillo, TX 79105 806-372-8523

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Coatings, Insulating-3100

† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
§ Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
§ Ambroid Co., Lynnfield, MA 01940 617-246-1180
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† CAD Engrg. & Assembly Inc., Mentor, OH 44060 216-255-7744
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
ChemRex Inc., ResTech Prods. Div., Commerce City, CO 80022 303-289-5651
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
† Conap, Inc., Olean, NY 14760 716-372-9650
† Cotronics, Brooklyn, NY 11235 718-646-7996
† Dennis Chemical, St. Louis, MO 63103 314-771-1800
§† Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
Electro-Science Labs., Inc., King of Prussia, PA 19406-1533 215-272-8000
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000

§ Epoxylite Corp., Irvine, CA 92713 714-951-3231
Evaporated Coatings, Inc., Willow Grove, PA 19090 215-659-3080
Ferro Corporation, Electronic Materials Div., Santa Barbara, CA 93117-3092 805-968-5000
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
Gasket International Inc., Bloomfield, NJ 07003 201-338-6814
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
§† HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
† IERC, Burbank, CA 91502 213-849-2481
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
§† Krystinel Corp., Paterson, NJ 07509 201-345-8900
Lancer Chemical, Warren, RI 02885 401-245-5493
† Master Bond, Hackensack, NJ 07601 201-343-8983
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
Molecu-Wire, Farmingdale, NJ 07727 201-938-9473
§† Multicore Solders, Westbury, NY 11590 516-334-7997
§ Murata Manufacturing Co., Ltd., Nagaoka-Kyo-Shi, Kyoto, JAPAN 617 ... 075-951-9111
† Nova Tran, Union Carbide Corp., Clear Lake, WI 54005 800-554-1697
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
† Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
† Whittaker Corp., Providence Chemicals Div., E. Providence, RI 02916 ... 401-434-1770
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Coatings, Moisture Repellant & Waterproofing-1600

§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
† Conap, Inc., Olean, NY 14760 716-372-9650
† Diagostic Instrument Corp., Ayer, MA 01432 508-772-4572
§ Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
Electro-Science Labs., Inc., King of Prussia, PA 19406-1533 215-272-8000
Ferro Corporation, Frit Division, Cleveland, OH 44101 216-641-8580
Ferro Corporation, Powder Coatings Div., Cleveland, OH 44101 216-641-8580
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
† Master Bond, Hackensack, NJ 07601 201-343-8983
§† Multicore Solders, Westbury, NY 11590 516-334-7997
† Nova Tran, Union Carbide Corp., Clear Lake, WI 54005 800-554-1697
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Coatings, Protective-1600

§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ..... C•1584,1726
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
§ Ambroid Co., Lynnfield, MA 01940 617-246-1180
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
Auric Corp., Newark, NJ 07114 201-242-4100
§† Caig Labs., Escondido, CA 92025 619-743-7143
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
† Conap, Inc., Olean, NY 14760 716-372-9650
† Diagostic Instrument Corp., Ayer, MA 01432 508-772-4572
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
† DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Electro-Science Labs., Inc., King of Prussia, PA 19406-1533 215-272-8000
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
† Epoxy Technology, Inc., Billerica, MA 01821 ..... 508-667-3805;800-227-2201
Ferro Corporation, Frit Division, Cleveland, OH 44101 216-641-8580
Ferro Corporation, Powder Coatings Div., Cleveland, OH 44101 216-641-8580
Fidelity Chemical Products Corp., Newark, NJ 07114 201-242-4110
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
Gasket International Inc., Bloomfield, NJ 07003 201-338-6814
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
§† HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
Lancer Chemical, Warren, RI 02885 401-245-5493
† Master Bond, Hackensack, NJ 07601 201-343-8983
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
§† Multicore Solders, Westbury, NY 11590 516-334-7997
† Nova Tran, Union Carbide Corp., Clear Lake, WI 54005 800-554-1697
Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
Sel-Rex Div., OMI Intl. Corp., Nutley, NJ 07110 201-667-5200
§† Tafa, Inc., Concord, NH 03301 603-224-9585
† Technic, Inc., Providence, RI 02901 401-781-6100
Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Whittaker Corp., Providence Chemicals Div., E. Providence, RI 02916 ... 401-434-1770

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Coils, Field-1800 — *See Vol. A*

Coils, Focusing-1800 — *See Vol. A*

Coils, Foil Wound-1800 — *See Vol. A*

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Coils, pi Winding-1800 — *See Vol. A*

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Communication Systems, Megalinks-1900 — *See Vol. D*

Communication Systems, Megaplex-1900 — *See Vol. D*

Communications Systems, Microwave-3400 — *See Vol. D*

Communications Systems, Multiplex-1900 — *See Vol. D*

Communications Systems, Telemetering-1900 — *See Vol. D*

Communications Systems, Telephone-1900 — *See Vol. D*

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Comparators, Attenuation-3400 — *See Vol. D*

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Component Handling Equipment, Surface Mount-4100 — *See Vol. D*

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§ Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
Armstrong World Inds., Lancaster, PA 17604 717-397-0611
§ Automation Unlimited, Icon Corporation, Woburn, MA 01801 617-933-7288
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
ChemRex Inc., ResTech Prods. Div., Commerce City, CO 80022 303-289-5651
§ Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
† Conap, Inc., Olean, NY 14760 716-372-9650
† Cotronics, Brooklyn, NY 11235 718-646-7996
† Danmar Inds., Chatsworth, CA 91311 ..... 818-882-7979/5280
† Dennis Chemical, St. Louis, MO 63103 314-771-1800
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
DuPont de Nemours, E. I, & Co., Wilmington, DE 19898 302-773-3218
§ EG & G Wakefield Engineering, Wakefield, MA 01880 617-245-5900
§ Epoxylite Corp., Irvine, CA 92713 714-951-3231
† Epoxy Technology, Inc., Billerica, MA 01821 ..... 508-667-3805;800-227-2201
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
† Hardman Inc., Belleville, NJ 07109 201-751-3000
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
Isolation Products, Inc., Sunnyvale, CA 94086 408-730-4672
Leepoxy Plastics, Inc., Ft. Wayne, IN 46809 219-747-7411
† Master Bond, Hackensack, NJ 07601 201-343-8983
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
Plasticorp, Harbor City, CA 90710 213-539-9530
Polymer Corp., Reading, PA 19605 215-320-6600
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
† Sigma Plastronics, Inc., Whitmore Lake, MI 48189 313-231-2871
§ Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501
† Whittaker Corp., Providence Chemicals Div., E. Providence, RI 02916 ... 401-434-1770
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Compounds, Insulating-3100

Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
§ Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321 ..... C•1689
† Ablestik Laboratories, Gardena, CA 90248 213-532-9341
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Conap, Inc., Olean, NY 14760 716-372-9650
† Dennis Chemical, St. Louis, MO 63103 314-771-1800
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
DuPont de Nemours, E. I, & Co., Wilmington, DE 19898 302-773-3218
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
Leepoxy Plastics, Inc., Ft. Wayne, IN 46809 219-747-7411
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Tra-Con, Inc., Medford, MA 02155 617-391-5550
Transene, Rowley, MA 01969 508-948-2501

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Conductive Elastomers-4525

† AME Corporation, Towaco, NJ 07082-0195, 201-263-1700 ..... B•1678
† Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151 ..... C•1733
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1344-1345
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242-2243
Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ..... C•1720-1721,1748
† Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749

A.C. Interface Inc., Irvine, CA 92718 714-472-9524
§ Ash-Lan Comps., Ash-Lan, Inc., Dallas, TX 75244 214-851-4005
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
Cotronics, Brooklyn, NY 11235 718-646-7996
Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
Instrument Specialties Co., Delaware Water Gap, PA 18327 717-424-8510
§† Insulcast, Permagile Inds. Inc., Plainview, NY 11803 516-349-1100
Monsanto Co., St. Louis, MO 63167 314-694-1000
Moxness Products, Inc., Versa Technologies, Racine, WI 53405 ..... 414-554-5050; 800-558-5706
† Orcus, Kansas City, MO 64112 913-897-5128
§† Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
Triac Electronic Systems, Inc., Glendale, NY 11385 718-441-4759
§ Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

Conductive Fabrics, Films & Tapes — See Fabrics, Conductive (Vol. C)

Conductive Floor Coatings & Cleaners-1600

§† ACL Inc., Elk Grove, IL 60007 ..... 312-981-9212;800-STATIC-0
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

Conductive Plastic Materials & Parts-4525

† Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151 ..... C•1733
Litton Potentiometer Div., Mt. Vernon, NY 10551, 914-664-7733 ..... A•2119
§† NRD Inc., Subsidiary of Mark IV Inds., Inc., Grand Island, NY 14072, 716-773-7634 ..... D•2244
Schlegel Corp., Rochester, NY 14692, 716-427-7200 ..... C•1747
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242
Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749
ADE, Inc., Chicago, IL 60633 312-646-3400
American Cyanamid Co., Metal Coated Fibers Dept., Wayne, NJ 07470 .. 201-831-2856
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
† Contact East, N. Andover, MA 01845 508-682-2000
§ Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Gordon, L., Packaging, Baltimore, MD 21230 301-539-6537
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Monsanto Co., St. Louis, MO 63167 314-694-1000
† Orcus, Kansas City, MO 64112 913-897-5128
Rogers Corp., Rogers, CT 06263 203-774-9605
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
§† Simco Co., Hatfield, PA 19440 215-822-2171
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Tra-Con, Inc., Medford, MA 02155 617-391-5550
† Transmet Corp., Columbus, OH 43228 ..... 614-276-5522;800-245-5253
Triac Electronic Systems, Inc., Glendale, NY 11385 718-441-4759
† United Foam Plastics, Georgetown, MA 01833 508-352-2200
§† Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Conduit, Electrical-6000

† Air/Flex Inds. Inc., S. El Monte, CA 91733 818-579-7060
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§ The Wiremold Company, W. Hartford, CT 06110 203-233-6251
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Connecting Blocks, Data-2100

Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
§ Bussmann:Cooper Industries, St. Louis, MO 63178, 314-394-2877 ..... C•1295
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... C•1563
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ ICC, Inc., Orange, CA 92665 714-998-8310
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300

Connecting Blocks, Modular Telephones-2100

Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
Accurate Electronics, Elyria, OH 44036 216-366-6330
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§ ICC, Inc., Orange, CA 92665 714-998-8310
§ International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028

Connector Adapters-2100

§† Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
Ault, Incorporated, Minneapolis, MN 55430, 612-560-9300 ..... D•1641
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007, 312-981-6000 ..... C•1307
§ Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103 ..... C•1308
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312
Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1315
§ EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1350,1352
Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... C•1369
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ..... C•1386
§ Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1394
L-Com Inc., N. Andover, MA 01845, 508-682-6936 ..... B•1783
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1422-1423,1425, D•1906-1907
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ..... C•1442
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1472
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578, 312-438-4000 ..... C•1514
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1558-1560
Accurate Electronics, Elyria, OH 44036 216-366-6330
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
† Air/Flex Inds. Inc., S. El Monte, CA 91733 818-579-7060
† Alden Products Co., Brockton, MA 02403 508-583-0160
† Alford Manufacturing Co., Woburn, MA 01801 617-935-8610
§ American Advantech Corp., San Jose, CA 95122 408-293-6786
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Ark-Les, Watertown, MA 02172 617-924-2330
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§† Bird Electronic Corp., Cleveland, OH 44139-2794 216-248-1200
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
C & C Jetronic, Inc., Princeton, NJ 08540 609-921-8540
Chabin Corp., Chico, CA 95926 916-891-6410
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
§ Compac, Holbrook, NY 11741 516-585-3400
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050

DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
†Elcom Systems, Inc., Boca Raton, FL 33487 305-994-1774
Elpac Power Systems, Elpac Electronics, Inc., Santa Ana, CA 92705 714-979-4440
†FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366
†The First Electronics Corp., Boston, MA 02125 617-288-2430
§†Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
†Glenair Inc., Glendale, CA 91201-2497 818-247-6000
GTE Fiberoptic Products, Williamsport, PA 17701 ... 717-326-6591;1-800-FBR-OPTICS
§Hewlett-Packard Co., Cupertino, CA 95014 800-752-0900
§Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
International Configurations, Inc., Enfield, CT 06082 203-749-6380
§International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§†ITT Sealectro, Trumbull, CT 06611 203-372-4118
†Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
§†Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
§†M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
†Maury Microwave Corp., Cucamonga, CA 91730 714-987-4715
McKenzie Technology, Fremont, CA 94538 415-651-2700
§Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§†Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
†Microlab/FXR, Livingston, NJ 07039 201-992-7700
†Micro Mode Prods., El Cajon, CA 92020 619-449-3844
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
National Tel-Tronics, Meadville, PA 16335 814-724-6440
NT.T/WaveConn, Meadville, PA 16335 ..... 800-535-3162;914-591-4173
§Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§Recoton Corp., Long Island City, NY 11101 718-392-6442
†RLC Electronics, Inc., Mt. Kisco, NY 10549 914-241-1334
†Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§†Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
Spectrum Control, Inc., Erie, PA 16505 814-455-0966
Staffall Inc., Cranston, RI 02910 401-461-5554
†Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§Test Probes, Inc., San Diego, CA 92121 619-535-9292
†Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
Vann Instruments, Inc., Albuquerque, NM 87106 505-265-2498
§Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§Wall-Able Mfg. Corp., Elk Grove VL, IL 60007 312-956-8000
§Wiltron, Morgan Hill, CA 95037-2809 408-778-2000
†Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

Connector Backshells-2100

§†Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
Calmark Corp., San Gabriel, CA 91776, 818-287-0451 ..... C•1015
§Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1298-1299
§EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
§3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1447,1449
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A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
Amerex, Riverside, CA 92516 714-686-1400
§AMP, Harrisburg, PA 17105 717-564-0100
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
§Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
†Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§†Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§†CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§Erni Components, Richmond, VA 23236 804-794-6367
†FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366
§†Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
†Glenair Inc., Glendale, CA 91201-2497 818-247-6000
Hewlett-Packard Co., Cupertino, CA 95014 800-752-0900
§Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
Holmberg Elctrns., Inman, SC 29349 803-472-4141
†Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ICC, Inc., Orange, CA 92665 714-998-8310
§International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§†Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
†Sabritec, Irvine, CA 92714 714-660-1970
Siltronics Ltd., Dover, MA 02030 617-329-4068
†Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§†Terminal Data Corp., Rockville, MD 20855 301-921-8282
§Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
§Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
†Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

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†AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132,1135
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
†Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1383
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§WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563,1568,1573
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§†Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Douglas Electronics, San Leandro, CA 94577 415-483-8770
†Eastern Electronics Mfg. Corp., National Patent Dev. Corp., East Hartford, CT 06108 203-528-9821
§EBY Company, Philadelphia, PA 19124 215-537-4700
†Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§†Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§†Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
§Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§†Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
TELTEC, INC., Minneapolis, MN 55425 612-854-9632
†Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
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§Perma Power Elctrns., Chicago, IL 60648, 312-647-9414 ..... C•1620-1621
§Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1508-1509
§Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... C•1520-1522
Accurate Electronics, Elyria, OH 44036 216-366-6330
Alden Products Co., Brockton, MA 02403 508-583-0160
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
§†Brooks Electronics, Philadelphia, PA 19140 215-228-4433
§Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Configurations, Inc., Enfield, CT 06082 203-749-6380
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
Pomona Electronics, Pomona, CA 91766 714-623-3463
†Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§SL Waber, Inc., Mt. Laurel, NJ 08054 ..... 609-866-8888;800-257-8384
§†Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
§Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§WECO Electrical Connectors, inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136
§The Wiremold Company, W. Hartford, CT 06110 203-233-6251
†Zero Corp., Burbank, CA 90503 818-846-4191

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Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
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§ **Corcom, Inc., Libertyville, IL 60048, 312-680-7400 ..... C•1317**
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§ **EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349**
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382,1384-1385
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 .. C•1416, D•1907
§† **Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1467**
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1470-1471,1910-1913
Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1506-1509
§ **Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... C•1520-1522**
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... C•1563
§ **WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563,1572**
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
AMP, Harrisburg, PA 17105 717-564-0100
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
§ Hirose Electric U.S.A, Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
International Configurations, Inc., Enfield, CT 06082 203-749-6380
Kaut & Bux Manufacturing Co., Mundelein, IL 60060 312-949-8505
Lamb Industries, Inc., Portland, OR 97225 503-297-8878
LMI Connectors, Inc., Los Angeles, CA 90028 213-463-2295
MOLEX, Inc., Lisle, IL 60532 312-969-4550
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
Senior Inds., Inc., Wood Dale, IL 60191 312-350-1600
§ Superior Electric, Bristol, CT 06010 203-582-9561
§ USD Products, Cooper Industries, Chicago, IL 60656 312-867-4600
U.S. Instr. Rentals, San Mateo, CA 94403 800-824-2873
§ Wall-Able Mfg. Corp., Elk Grove VL, IL 60007 312-956-8000

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† **Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1315**
§ **EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349**
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382,1384
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JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1389
§ **LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1423,1429, D•1907
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477**
§ **Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578, 312-438-4000 ..... C•1514**
† **Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1519**
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920**
§ **Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1534-1536**
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
AMP, Harrisburg, PA 17105 717-564-0100
† Amel Electronics, N. Bergen, NJ 07047 201-869-4201
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§ Ercona, Patchogue, NY 11772 516-758-0700
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
§ Hirose Electric U.S.A, Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Microtech, Boothwyn, PA 19061 215-459-3566
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§ Wall-Able Mfg. Corp., Elk Grove VL, IL 60007 312-956-8000
§† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

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† **Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1315**
Electrochem Industries, Wilson Greatbatch Ltd., Clarence, NY 14031, 716-759-7320 ..... D•1489
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Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1382
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ..... C•1386
§ **Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... D•1514-1515**
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ..... C•1525,1527,1920, D•1527**
§ **Shokai Far East, Ltd., Hartsdale, NY 10530, 914-681-0700 ..... B•1187**
§ **Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529**
§† **Tauber Elctrns. Inc., San Diego, CA 92117, 619-274-7242 ..... D•1532**
Accurate Electronics, Elyria, OH 44036 216-366-6330
Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
Adcour, Inc., Sharon, MA 02067 617-784-8123
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
AMP, Harrisburg, PA 17105 717-564-0100
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Bogen Communications, Inc., Ramsey, NJ 07446 201-934-8500
§ C&D Charter Power Systems, Plymouth Meeting, PA 19462 215-828-9000
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
Eagle-Picher, Seneca, MO 64865 417-776-2256
§† Elcon Products Internationai Company, Fremont, CA 94538 415-490-4200
Energy Concepts Inc., Carlsbad, CA 92009 619-438-2202
Engineered Assemblies Corp., Clifton, NJ 07011 ..... 201-340-0600;1-800-950-9111
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
§† Gruenberg Oven Co., Inc., Williamsport, PA 17701 717-326-1755
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
§ International Components Corp., Melville, NY 11747 516-293-1500
† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
Nesco Battery Systems, National Electro-Sales Corp., Van Nuys, CA 91406-7840 818-781-0505
PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Plainview Batteries, Inc., Boca Raton, FL 33487 407-997-7705
§ Rose Electronics,Inc. Div. of Energy Products Group, San Jose, CA 95131 408-943-0440
SAFT America, Inc., Portable Battery Division, Valdosta, GA 31601 912-247-2331
Senior Inds., Inc., Wood Dale, IL 60191 312-350-1600
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
U.S. Terminals, Cincinnati, OH 45243 513-561-8145
Whittaker-Yardney Power Systems, Whittaker-Tech. Prods., Inc., Pawcatuck, CT 02891 203-599-1100
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1761
† **AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132,1135**
§† **Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310**
§† **AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157**
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ **Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297-1299**
† **Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1302-1303**
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
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Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1318
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1331,1336-1337,1340-1342
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Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353-1355,1360
§ **Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 ..... C•1361-1362,1364-1366**
† **Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382-1385**
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1390

§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1411
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1415,1417,1420-1423,1429,1433, D•1907
§† 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466-1468,1909
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
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† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517-1519
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
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† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069, 818-707-2020 ..... C•1554
† Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730 714-945-1365
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
Andrew Corp., Orland Pk., IL 60462 800-255-1479
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Burndy Corporation, Norwalk, CT 06852 203-838-4444
Burton Electrical Engineering, Wyle Laboratories, El Segundo, CA 90245-0217 213-772-1406
Cable Systems, Inc., Everett, MA 02149 617-389-7080
Cambridge Products, Bloomfield, CT 06002 ..... 203-243-1761, 800-243-8814
C & C Jetronic, Inc., Princeton, NJ 08540 609-921-8540
Chabin Corp., Chico, CA 95926 916-891-6410
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
EBY Company, Philadelphia, PA 19124 215-537-4700
§† Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
Elpac Power Systems, Elpac Electronics, Inc., Santa Ana, CA 92705 714-979-4440
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Giannini Institute, Indio, CA 92201 619-347-2833
GTE Fiberoptic Products, Williamsport, PA 17701 ... 717-326-6591;1-800-FBR-OPTICS
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Holmberg Elctrns., Inman, SC 29349 803-472-4141
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
§ ICC, Inc., Orange, CA 92665 714-998-8310
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§† Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
International Components Corp., Melville, NY 11747 516-293-1500
International Configurations, Inc., Enfield, CT 06082 203-749-6380
§ International Instrumentation, Inc., Westlake Vlg, CA 91361 805-495-7673
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
§ Johnson, E. F., Co., Minneapolis, MN 55459-0099 612-942-1000
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
L-Com Inc., N. Andover, MA 01845 508-682-6936
LMI Connectors, Inc., Los Angeles, CA 90028 213-463-2295
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
† Mac Panel Co., High Point, NC 27264 919-884-8111
† Maury Microwave Corp., Cucamonga, CA 91730 714-987-4715
Metuchen Capacitors, Inc., Old Bridge, NJ 08857 201-679-3366
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
† Micro Mode Prods., El Cajon, CA 92020 619-449-3844
§† Microtech, Boothwyn, PA 19061 215-459-3566
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
† Min-E-Con, Irvine, CA 92714 714-250-0474
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
Mueller Elec. Co., Cleveland, OH 44114 216-771-5225
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
† Narda Microwave Corp., Subsidiary of Loral Corp., Hauppauge, NY 11788 516-231-1700
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Precision Interconnect, Portland, OR 97224 503-620-9400
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Qualtek Electronics Corp., Mentor, OH 44060 216-951-3300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
† Sabritec, Irvine, CA 92714 714-660-1970
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Square D Co., Palatine, IL 60067 312-397-2600
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§† Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
§† Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
U.S. Instr. Rentals, San Mateo, CA 94403 800-824-2873
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§ Wall-Able Mfg. Corp., Elk Grove Vl., IL 60007 312-956-8000
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877
Wells Electronics, South Bend, IN 46613 219-287-5941
† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

Connectors, Circular, MS/AN-2100

AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§† Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Alden Products Co., Brockton, MA 02403, 508-583-0160 ..... C•1145
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
† Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1303
Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007, 312-981-6000 ..... C•1306
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011, 212-691-9050 ..... C•1330
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1354-1360
Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... C•1378,1380
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1385
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1390
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1417,1420-1421,1423, D•1907
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1917-1918
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517-1518
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ AMP, Harrisburg, PA 17105 717-564-0100
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Autoswage Products, Shelton, CT 06484 203-929-1401
Braxton Mfg., Watertown, CT 06795 203-274-6781
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Burndy Corporation, Norwalk, CT 06852 203-838-4444
Burton Electrical Engineering, Wyle Laboratories, El Segundo, CA 90245-0217 213-772-1406
C & C Jetronic, Inc., Princeton, NJ 08540 609-921-8540
Ceramaseal, New Lebanon, NY 12125 518-794-7800

§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
Components Unlimited, Inc., Portland, OR 97223 503-620-3522
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
† FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366
§† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Hoffman Engineering Corp., Stamford, CT 06902 203-325-8933
§ Holmberg Elctrns., Inman, SC 29349 803-472-4141
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
ICC, Inc., Orange, CA 92665 714-998-8310
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
Sabritec, Irvine, CA 92714 714-660-1970
† Sealtron, Inc., Cincinnati, OH 45215 513-733-8400
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
§† Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330

Connectors, DIN-2100

§ Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1286
Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1288
Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1293
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297,1299
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007, 312-981-6000 ..... C•1305-1306
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§ CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1322
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 ..... C•1347
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... C•1585
Elpac Power Systems, Elpac Electronics, Inc., Santa Ana, CA 92705, 714-979-4440 ..... D•1745
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... C•1380
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1417,1420,1430,1434-1435,1871, D•1907
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466
§ Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578, 312-438-4000 ..... C•1514
Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... C•1520
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
§ Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... C•1539,1541
Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
AMP, Harrisburg, PA 17105 717-564-0100
§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730 714-945-1365
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Components Unlimited, Inc., Portland, OR 97223 503-620-3522
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
CTS Corporation, Elkhart, IN 46514 219-293-7511
CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Edac Inc., Scarborough, Ont., CAN M1V 5B6 416-754-3322
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
† Electronic Modular Systems, Inc., Pasadena Technology Corp., Carrollton, TX 75006 214-446-2900
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
§ Erni Components, Richmond, VA 23236 804-794-6367
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Holmberg Elctrns., Inman, SC 29349 803-472-4141
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§ International Components Corp., Melville, NY 11747 516-293-1500
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
LMI Connectors, Inc., Los Angeles, CA 90028 213-463-2295
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
RDI Elctrns., Inc., New Rochelle, NY 10801 914-632-2828
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Siltronics Ltd., Dover, MA 02030 617-329-4068
§ SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
§† Souriau, Inc., Valencia, CA 91355 805-257-4830
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Sullins Electronics Corp., San Marcos, CA 92069 619-744-0125
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§ Wall-Able Mfg. Corp., Elk Grove VL, IL 60007 312-956-8000

Connectors, D Subminiature-2100

§† Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1288-1289
Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1292
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297-1299
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007, 312-981-6000 ..... C•1305
§ Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103 ..... C•1308
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§† CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1320,1323
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180, 605-665-9301 ..... C•1327
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011, 212-691-9050 ..... C•1330
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1341
§ EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 ..... C•1361
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... C•1378-1380
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1391
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1417,1432-1433,1435, D•1907
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ... C•1442-1445
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1450-1451,1881
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1917-1919
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1518-1519
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... C•1577
ADI Electronics, Ronkonkoma, NY 11779 516-737-1800
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
Amphenol Canada Corporation, An LPL Company, Scarborough, Ontario, CANADA M1B 2X6 416-291-4401
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730 714-945-1365
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810

§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§ Ercona, Patchogue, NY 11772 516-758-0700
§ Erni Components, Richmond, VA 23236 804-794-6367
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§† Holmberg Elctrns., Inman, SC 29349 803-472-4141
§ ICC, Inc., Orange, CA 92665 714-998-8310
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
Interconnect Technologies, Inc., Hamden, CT 19355 203-288-8428
§ International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ JBT Intl. Inc., Jl Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
L-Com Inc., N. Andover, MA 01845 508-682-6936
MACOM, Inc., Burlington, MA 01803 617-272-3000
Mhotronics., Inc., Vernon Hills, IL 60061 312-948-5600
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Murata Erie North America, Inc., Smyrna, GA 30080 404-436-1300
§ Murata Manufacturing Co., Ltd., Nagaoka-Kyo-Shi, Kyoto, JAPAN 617 ... 075-951-9111
National Telephone & Electronics Inc., Miami, FL 33172 305-592-0551
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
RDI Elctrns., Inc., New Rochelle, NY 10801 914-632-2828
§ Remee Products Corp., Florida, NY 10921 914-651-4431
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
† Sabritec, Irvine, CA 92714 714-660-1970
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Spectrum Control, Inc., Erie, PA 16505 814-455-0966
§ Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Terminal Data Corp., Rockville, MD 20855 301-921-8282
§ Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
U.S. Terminals, Cincinnati, OH 45243 513-561-8145
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§ Wall-Able Mfg. Corp., Elk Grove VL, IL 60007 312-956-8000
§ Welcon/Wells, South Bend, IN 46613 219-287-5941
§† Wells Electronics, South Bend, IN 46613 219-287-5941

Connectors, Edgeboard – See Connectors, Printed Circuit, Card Edge (Vol. C)

Connectors, Elastomeric-2100

Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1344-1345
Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ..... C•1720-1721,1748
AMP, Harrisburg, PA 17105 717-564-0100
Elform, Inc., Reno, NV 89510 702-356-1734
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
GTE Fiberoptic Products, Williamsport, PA 17701 ... 717-326-6591;1-800-FBR-OPTICS
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000

Connectors, Fiber Optic-2475 – *See Vol. B*

Connectors, Filtered-2100

Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
§ Corcom, Inc., Libertyville, IL 60048, 312-680-7400 ..... C•1317
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1391
† Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ..... C•1442
§ Murata Erie North America, Inc., Smyrna, GA 30080, 404-436-1300 ..... A•1708
Oxley, Inc., Branford, CT 06405, 203-488-1033 ..... A•1715
§ Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... A•1670-1671
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§† AMP, Harrisburg, PA 17105 717-564-0100
§ Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Amphenol Canada Corporation, An LPL Company, Scarborough, Ontario, CANADA M1B 2X6 416-291-4401
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
§ Ercona, Patchogue, NY 11772 516-758-0700
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Frequency Electronics, Inc., Mitchel Field, NY 11553 516-794-4500
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
§ Murata Manufacturing Co., Ltd., Nagaoka-Kyo-Shi, Kyoto, JAPAN 617 ... 075-951-9111
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
§ Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Qualtek Electronics Corp., Mentor, OH 44060 216-951-3300
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Sabritec, Irvine, CA 92714 714-660-1970
§ Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Spectrum Control, Inc., Erie, PA 16505 814-455-0966
ST Research Corporation, Newington, VA 22122 703-550-7000

Connectors, Flat Cable (Incl. Flexible)-2100

† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1287,1765
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1273
Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1288
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297-1299
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1318
§† CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1320-1321
§† DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1332,1334-1335,1338,1341-1342
§ Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 ..... C•1361-1363
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... C•1378
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382,1384
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 .... C•1388-1390
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1420,1433
§† 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1450-1451,1881
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466-1468
T-Bar Incorporated, a Data Switch Co., Shelton, CT 06484, 203-926-1801 ..... B•1850
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... C•1577
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
† Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730 714-945-1365
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§ Aromat Corp., New Providence, NJ 07974 201-464-3550
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
DOW SWITCH, Wilmington, MA 01887 617-935-6395
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
Elform, Inc., Reno, NV 89510 702-356-1734
§ Erni Components, Richmond, VA 23236 804-794-6367
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ JBT Intl. Inc., Jl Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Mhotronics., Inc., Vernon Hills, IL 60061 312-948-5600

Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
§ PCD, Peabody, MA 01960 508-532-8800
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
§ Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
U.S. Instr. Rentals, San Mateo, CA 94403 800-824-2873
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136

Connectors, Fused-2100

§ Bussmann:Cooper Industries, St. Louis, MO 63178, 314-394-2877 ..... C•1295
§ Corcom, Inc., Libertyville, IL 60048, 312-680-7400 ..... C•1317
Delta Products Corporation, Fremont, CA 94538, 415-770-0660 .... C•1328-1329
E-T-A Circuit Breakers, Chicago, IL 60648, 312-647-8303 ..... B•1366
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1471,1910-1911
§ Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... C•1521-1522
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722

Connectors, Heavy Duty, Power-2100

§† Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Corcom, Inc., Libertyville, IL 60048, 312-680-7400 ..... C•1317
E-T-A Circuit Breakers, Chicago, IL 60648, 312-647-8303 ..... B•1366
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353,1355
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382,1384
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1472
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1506-1509
§ Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... C•1520-1522
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... C•1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1574
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Burton Electrical Engineering, Wyle Laboratories, El Segundo, CA 90245-0217 213-772-1406
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§† Ericson Manufacturing Co., Willoughby, OH 44094 216-951-8000
§ Erni Components, Richmond, VA 23236 804-794-6367
† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
International Configurations, Inc., Enfield, CT 06082 203-749-6380
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
LMI Connectors, Inc., Los Angeles, CA 90028 213-463-2295
MACOM, Inc., Burlington, MA 01803 617-272-3000
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Sabritec, Irvine, CA 92714 714-660-1970
§ Square D Co., Palatine, IL 60067 312-397-2600
§† Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
§ Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
§ USD Products, Cooper Industries, Chicago, IL 60656 312-867-4600
§† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

Connectors, Hermetically Sealed, Pressurized, or Waterproof-2100

§† Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Caton Connector Corp., Kingston, MA 02364, 617-585-4315 .. C•1300,1303-1304
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011, 212-691-9050 ..... C•1330
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353-1355
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1404,1406-1409
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1420,1871
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
AMP, Harrisburg, PA 17105 717-564-0100
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§† Applied Engineering Products, New Haven, CT 06525 203-387-5282
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
§† Ericson Manufacturing Co., Willoughby, OH 44094 216-951-8000
§ Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Frequency Electronics, Inc., Mitchel Field, NY 11553 516-794-4500
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
† Gulton Industries, Inc., Servonic Div., Costa Mesa, CA 92627 ..... 714-642-2400; 800-854-4066
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
MACOM, Inc., Burlington, MA 01803 617-272-3000
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
PAVE Technology Co., Inc., Dayton, OH 45414-3445 513-890-1100
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Sabritec, Irvine, CA 92714 714-660-1970
† Sealtron, Inc., Cincinnati, OH 45215 513-733-8400
§† Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
§† Souriau, Inc., Valencia, CA 91355 805-257-4830
Standex Electronics, Standex International, Cincinnati, OH 45209 513-871-3777
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Tricon Industries, Inc., Electromechanical Division, Downers Grove, IL 60515-4076 312-964-2330
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
† Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100

Connectors, High Density, Multipin-2100

† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1287
§† CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1323
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011, 212-691-9050 ..... C•1330
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1340
Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 ..... C•1347
§ Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 .... C•1361,1364-1366
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382-1385
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 .... C•1388-1390
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1409
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1434
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466-1468
Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1510-1511,1718
Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 .... C•1540
§† Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... C•1542,1546
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000

§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Erni Components, Richmond, VA 23236 804-794-6367
† FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366
Fischer Connectors, Valencia, CA 91355 ..... 818-362-9395 ,800-344-0445
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ ICC, Inc., Orange, CA 92665 714-998-8310
Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
† Min-E-Con, Irvine, CA 92714 714-250-0474
PCD, Peabody, MA 01960 508-532-8800
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
Siltronics Ltd., Dover, MA 02030 617-329-4068
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
§† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

Connectors, High Voltage (1,000 Volts & Over)-2100

AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§ Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
† Alden Products Co., Brockton, MA 02403, 508-583-0160 ..... C•1144-1146
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Bertan Assocs., Hicksville, NY 11801, 516-433-3110 ..... D•1649
† Caton Connector Corp., Kingston, MA 02364, 617-585-4315 .. C•1300-1301,1303
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011, 212-691-9050 ..... C•1330
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353,1355-1359
Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... C•1369
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382,1384-1385
† Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ..... C•1392-1393
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1409,1411,1413
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517-1519
† U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... C•1557
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
† Alberox Corporation, New Bedford, MA 02745 508-995-1725
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
† AMP, Harrisburg, PA 17105 717-564-0100
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
† Engine Systems Division, Simmonds Precision, Norwich, NY 13815 607-335-5000
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
High Voltage Technology Inc., Yonkers, NY 10701 914-423-6636
§ Hobson Bros., Chicago, IL 60630-3884 312-283-3600
Isolation Products, Inc., Sunnyvale, CA 94086 408-730-4672
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
† Sealtron, Inc., Cincinnati, OH 45215 513-733-8400
§† Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
§ Square D Co., Palatine, IL 60067 312-397-2600
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
§† U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080

Connectors, IDC (Insulation Displacement Contact)-2100

§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... C•1765
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297-1299
§† CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1321-1322
EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
§ Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 ..... C•1361-1365
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1388,1390-1391
Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1396
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1467
§† Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... C•1577
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ CSD Industries, Inc., dba C Enterprises , San Marcos, CA 92069 ..... 619-744-8182; 800-334-3815;800-423-3345
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
§ Erni Components, Richmond, VA 23236 804-794-6367
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ PCD, Peabody, MA 01960 508-532-8800
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Souriau, Inc., Valencia, CA 91355 805-257-4830
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

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Connectors, LCD-2100

§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
Autoswage Products, Shelton, CT 06484 203-929-1401
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
Elastomeric Technologies, Inc., Hatboro, PA 19040 ..... 215-672-0787;215-672-4741
† Elform, Inc., Reno, NV 89510 702-356-1734
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
† UCE, Inc., Norwalk, CT 06854 203-838-7509

Connectors, Magnetron-2100

† Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ..... C•1392
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1434

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Connectors, Mixed Contact Configurations-2100

Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353,1355
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382,1385

JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... **C•1390**
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... **C•1401-1409,1413**
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... **C•1439**
Multi-Contact USA, Santa Rosa, CA 95401, 707-575-7575 ..... **C•1460-1462**
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... **C•1466**
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ AMP, Harrisburg, PA 17105 717-564-0100
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Babcock Display Products, Inc., A Subsidiary of Babcock, Inc., Anaheim, CA 92805 714-491-5121
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
Compac, Holbrook, NY 11741 516-585-3400
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§ Emi Components, Richmond, VA 23236 804-794-6367
† FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136
§† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

Connectors, Printed Circuit Board, Programmable-2100

§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... **C•1348**
Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... **C•1378-1380**
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... **C•1390-1391**
Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... **C•1558-1561**
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... **C•1579**
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
§ Emi Components, Richmond, VA 23236 804-794-6367
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311

Connectors, Piggy Back — See Connectors, Wirewrap (Z-3 Level) (Vol. C)

Connectors, Plug-in, Program Board-2100

AMP, Harrisburg, PA 17105, 717-564-0100 ..... **C•1157**
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... **C•1286**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 .. **C•1420, D•1907**
McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... **C•1437**
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... **C•1881**
Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 .... **C•1540**
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... **C•1563-1571,1573**
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... **C•1563-1573**
Accurate Electronics, Elyria, OH 44036 216-366-6330
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730 714-945-1365
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
Augat Inc., Attleboro, MA 02703 617-222-2202
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Crosspoint, Div. of Info-Lite, Fairview, NJ 07022 201-941-4455
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
§† DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
§ EBY Company, Philadelphia, PA 19124 215-537-4700
E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§† Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§ Interswitch, Wm. J. Purdy Co., Burlingame, CA 94010 415-347-8217
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
† Mac Panel Co., High Point, NC 27264 919-884-8111
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
National Tel-Tronics, Meadville, PA 16335 814-724-6440
NT.T/WaveConn, Meadville, PA 16335 ..... 800-535-3162;914-591-4173
Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
Staffall Inc., Cranston, RI 02910 401-461-5554
§ Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§† Superior Electric, Bristol, CT 06010 203-582-9561
§ Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
§ Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
Tricon Industries, Inc., Electromechanical Division, Downers Grove, IL 60515-4076 312-964-2330
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
† Virginia Panel, Waynesboro, VA 22980 703-949-8376

Connectors, Printed Circuit, Card Edge-2100

AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... **C•1132**
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... **C•1157**
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... **C•1267**
§ Amphenol/Spectra Strip, Hamden, CT 06514, 203-281-3200 ..... **C•1287**
Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... **C•1297,1299**
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007, 312-981-6000 ..... **C•1305**
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... **C•1309**
§ Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... **C•1318**
§† CW Industries, Southhampton, PA 18966, 215-355-7080 ..... **C•1320,1322**
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180, 605-665-9301 ..... **C•1325-1327**
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... **C•1331,1334-1340,1342**
Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 ..... **C•1346**
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 .. **C•1359**
§ Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 ..... **C•1361-1363,1365-1366**
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... **C•1383**
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... **C•1125**
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 .... **C•1388-1389**
§† Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... **C•1394**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... **C•1415,1417,1420-1421,1424,1430-1433, D•1034-1035**
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... **C•1438-1439**
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... **B•1815, C•1881**
Multi-Contact USA, Santa Rosa, CA 95401, 707-575-7575 ..... **C•1460-1462**
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... **D•2241**
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... **C•1466-1468**
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... **C•1091**
Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... **A•1670-1671**
§ Sullins Electronics Corp., San Marcos, CA 92069, 619-744-0125 ... **C•1530-1531**
§† Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... **C•1538-1541**
§† Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... **C•1546**
§† Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... **C•1551-1553**
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716, 516-589-8080 ..... **C•1555**
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... **C•1564-1565**
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... **C•1564-1565,1568**
Accurate Electronics, Elyria, OH 44036 216-366-6330
ADI Electronics, Ronkonkoma, NY 11779 516-737-1800
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
Amlan, Inc., Stamford, CT 06903 203-322-1913
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730 714-945-1365
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
Aromat Corp., New Providence, NJ 07974 201-464-3550
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
† Caton Connector Corp., Kingston, MA 02364 617-585-4315
§ Cincinnati Electrosystems, Loveland, OH 45140 513-831-6800

Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Compac, Holbrook, NY 11741 516-585-3400
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
§ Components Corp., Denville, NJ 07834 201-627-0290
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
† CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
† CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
Dixson, Inc., Grand Junction, CO 81503 ..... 303-242-8863 (ext 223)
Douglas Electronics, San Leandro, CA 94577 415-483-8770
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
§ EBY Company, Philadelphia, PA 19124 215-537-4700
§ Edac Inc., Scarborough, Ont., CAN M1V 5B6 416-754-3322
§† Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
GTE Products Corp., Williamsport, PA 17701 717-326-6591
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§† Holmberg Elctrns., Inman, SC 29349 803-472-4141
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§† Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
International Mircoelectronics, Arlington, TX 76003 817-561-2244
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
LMI Connectors, Inc., Los Angeles, CA 90028 213-463-2295
§† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
NT.T/WaveConn, Meadville, PA 16335 ..... 800-535-3162;914-591-4173
§ PCD, Peabody, MA 01960 508-532-8800
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
§ Souriau, Inc., Valencia, CA 91355 805-257-4830
Staffall Inc., Cranston, RI 02910 401-461-5554
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Symtron Corp. Div, Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
§† Texas Instrs., Inc., Dallas, TX 75380 ..... 800-232-3200 (ext 700)
§† Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
Urban Electronics, Dover, MA 02030 617-329-4068
§ USD Products, Cooper Industries, Chicago, IL 60656 312-867-4600
§† Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§ Wago Corp., Brown Deer, WI 53223 414-354-5511
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877
§ Welcon/Wells, South Bend, IN 46613 219-287-5941
§† Wells Electronics, South Bend, IN 46613 219-287-5941
§† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

Connectors, Printed Circuit (Other than Card Edge)-2100

† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1290,1292-1293
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297-1299
§ Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103 ..... C•1308
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§† CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1320,1323
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180, 605-665-9301 ..... C•1327
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 .... C•1333,1342
Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 ..... C•1347
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353,1355,1359
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1383
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 .... C•1388-1389
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402,1406-1408,1410
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1415,1417,1420-1421,1424,1430-1433,1435, D•1907
§† 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ..... C•1445
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1450-1451,1881
Multi-Contact USA, Santa Rosa, CA 95401, 707-575-7575 ..... C•1460-1462
Oxley, Inc., Branford, CT 06405, 203-488-1033 ..... C•1465
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466,1468
Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1718
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... C•1091
§ Schurter, Inc., Petaluma, CA 94952, 707-778-6311 ..... C•1520
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
§ Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529
§ Sullins Electronics Corp., San Marcos, CA 92069, 619-744-0125 ... C•1530-1531
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533,1535
§ Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... C•1538-1540
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069, 818-707-2020 ..... C•1554
§† Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1558-1561
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1563,1566-1571
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563,1566-1567,1569-1571
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
§† Applied Engineering Products, New Haven, CT 06525 203-387-5282
Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
† Caton Connector Corp., Kingston, MA 02364 617-585-4315
Chabin Corp., Chico, CA 95926 916-891-6410
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Components Corp., Denville, NJ 07834 201-627-0290
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
† CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Delta Electronics Mfg. Corp., Beverly, MA 01915 617-927-1060
Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
DOW SWITCH, Wilmington, MA 01887 617-935-6395
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§ EBY Company, Philadelphia, PA 19124 215-537-4700
§† Edac Inc., Scarborough, Ont., CAN M1V 5B6 416-754-3322
Elastomeric Technologies, Inc., Hatboro, PA 19040 ..... 215-672-0787;215-672-4741
Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
Elcon Products International Company, Fremont, CA 94538 415-490-4200
† Electronics Research Associates Inc., Winsted, CT 06098 203-379-2731
Elform, Inc., Reno, NV 89510 702-356-1734
§ Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§ Erni Components, Richmond, VA 23236 804-794-6367
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Holmberg Elctrns., Inman, SC 29349 803-472-4141
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
§ ICC, Inc., Orange, CA 92665 714-998-8310
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ Jolo Industries, Inc., Garden Grove, CA 92643 714-554-6840
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
LMI Connectors, Inc., Los Angeles, CA 90028 213-463-2295
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361

† Min-E-Con, Irvine, CA 92714 714-250-0474
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
† PCD, Peabody, MA 01960 508-532-8800
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
Pomona Electronics, Pomona, CA 91766 714-623-3463
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578 312-438-4000
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
† Sealtron, Inc., Cincinnati, OH 45215 513-733-8400
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
§ Souriau, Inc., Valencia, CA 91355 805-257-4830
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
§ Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
§ Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
§ Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
Tricon Industries, Inc., Electromechanical Division, Downers Grove, IL 60515-4076 312-964-2330
§† U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
USD Products, Cooper Industries, Chicago, IL 60656 312-867-4600
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§ Wago Corp., Brown Deer, WI 53223 414-354-5511
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877

Connectors, Rack & Panel-2100

† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
Aiden Products Co., Brockton, MA 02403, 508-583-0160 ..... C•1145
Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1154-1155
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1290,1292
Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1303
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§ Corcom, Inc., Libertyville, IL 60048, 312-680-7400 ..... C•1317
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1319
§† Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180, 605-665-9301 ..... C•1327
E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1351
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1354,1359
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382-1383
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 .... C•1388-1390
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402,1405,1409
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1423,1871
Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ..... C•1442
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815
NES, Inc. (Nationwide Electronic Systems), Carpentersville, IL 60110, 312-426-5900 ..... D•1410
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517-1519
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... C•1091
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 .... C•1539
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
§† U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716, 516-589-8080 ..... C•1555
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1573-1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1565,1573-1574
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§† Air Electro Inc., Van Nuys, CA 91406 ..... 213-873-6400;818-988-4400
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
† Bailey Controls Co., Div. of Babcox & Wilcox, Wickliffe, OH 44092 216-585-8500
BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Carrot Components Corporation, Camarillo, CA 93010 805-484-0540
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
Douglas Electronics, San Leandro, CA 94577 415-483-8770
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
§ Edac Inc., Scarborough, Ont., CAN M1V 5B6 416-754-3322
§† Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
§† Elcon Products International Company, Fremont, CA 94538 415-490-4200
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
L-Com Inc., N. Andover, MA 01845 508-682-6936
LMI Connectors, Inc., Los Angeles, CA 90023 213-463-2295
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Middleberg Corporation/Mirkico Connectors, Canton, CT 06019 203-693-8361
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Min-E-Con, Irvine, CA 92714 714-250-0474
NTT/WaveConn, Meadville, PA 16335 ..... 800-535-3162;914-591-4173
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Radiall, Inc., Stratford, CT 06497 203-386-1030
Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Sabritec, Irvine, CA 92714 714-660-1970
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
§† Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Superior Electric, Bristol, CT 06010 203-582-9561
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
§ Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
§ Tex-Techs Connectors, Norwesco, Gastonia, NC 28053 704-866-9161
Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
† Virginia Panel, Waynesboro, VA 22980 703-949-8376
Wells Electronics, South Bend, IN 46613 219-287-5941

Connectors, RF, Coaxial & Triaxial-2100

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1761
AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§ Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1303
Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103 ..... C•1308
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312-1313,1617
† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314-1315
§ EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353,1355
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... C•1378-1380
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1385
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 .... C•1386,1864
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1404,1406-1409,1411
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1422-1424, 1434
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... C•1450-1451
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517,1519
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... C•1542
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069, 818-707-2020 ..... C•1554

§† Adams-Russell, Anzac Div., Burlington, MA 01803 671-273-3333
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Alden Products Co., Brockton, MA 02403 508-583-0160
† Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
Andrew Corp., Orland Pk, IL 60462 800-255-1479
† Antenna Specialists, The Allen Group, Cleveland, OH 44139 216-349-8400
§† Applied Engineering Products, New Haven, CT 06525 203-387-5282
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
§ B & L Coaxial Connectiions Ltd., Scarborough, CANADA M1V 2J9 416-292-3906
§† Bird Electronic Corp., Cleveland, OH 44139-2794 216-248-1200
§ Cambridge Products, Bloomfield, CT 06002 ..... 203-243-1761, 800-243-8814
† C & C Jetronic, Inc., Princeton, NJ 08540 609-921-8540
† C.E. Precision Assemblies, Inc., Chandler, AZ 85226 602-940-0740
Ceramaseal, New Lebanon, NY 12125 518-794-7800
Chabin Corp., Chico, CA 95926 916-891-6410
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
Communication Devices, Inc., Scarborough, Ont., CAN M1H3A4 416-439-6320
§ Compac, Holbrook, NY 11741 516-585-3400
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
† Connector Industries of America Div., Microdot Mfg., Cincinnati, OH 45215 513-733-3680
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
Delta Electronics Mfg. Corp., Beverly, MA 01915 617-927-1060
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§† EMC Technology Inc, Cherry Hill, NJ 08034 609-429-7800
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Frequency Electronics, Inc., Mitchel Field, NY 11553 516-794-4500
Gabriel Electronics, Scarborough, ME 04074 207-883-5161
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
† Imtronics Industries, St. Petersburg, FL 33716 813-572-9010
§ International Components Corp., Melville, NY 11747 516-293-1500
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
L-Com Inc., N. Andover, MA 01845 508-682-6936
† Light Control Systems Inc., Tyngsboro, MA 01879 617-649-9870
MACOM, Inc., Burlington, MA 01803 617-272-3000
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§† Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
† Maury Microwave Corp., Cucamonga, CA 91730 714-987-4715
3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Metuchen Capacitors, Inc., Old Bridge, NJ 08857 201-679-3366
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
† Micro Mode Prods., El Cajon, CA 92020 619-449-3844
§† Microtech, Boothwyn, PA 19061 215-459-3566
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
§ Murata Manufacturing Co., Ltd., Nagaoka-Kyo-Shi, Kyoto, JAPAN 617 ... 075-951-9111
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
NT.T/WaveConn, Meadville, PA 16335 ..... 800-535-3162;914-591-4173
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§ Penstock Engineering Labs., Penstock, Inc., Sunnyvale, CA 94086-4018 408-730-0300
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§† Radiall, Inc., Stratford, CT 06497 203-386-1030
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§† Remee Products Corp., Florida, NY 10921 914-651-4431
§ RF Industries, Celltronics, San Diego, CA 92121 619-587-0656
† Sabritec, Irvine, CA 92714 714-660-1970
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
§ Sitco Antennas Div.of Simplicity Tool Corp., Portland, OR 97220 503-253-2000
§† Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
§† Specialty Connector Co., Franklin, IN 46131 317-738-2800
§ Spectrum Control, Inc., Erie, PA 16505 814-455-0966
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
§ Wall-Able Mfg. Corp., Elk Grove Vl., IL 60007 312-956-8000
Whittaker Corp., Electronic Resources Div., Simi Valley, CA 93063 805-584-4100
§ Wiltron, Morgan Hill, CA 95037-2809 408-778-2000

Connectors, Solderless-2100

† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1285
Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1290
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1345
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 ..... C•1346
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1382
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1404
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1422-1423, D•1907
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ..... C•1445
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1450-1451,1881
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
§† Superior Electric, Bristol, CT 06010, 203-582-9561 ..... C•1532
§† Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 .... C•1538
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1564,1568-1570,1572
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1564-1565,1568-1570,1572
† Accurate Electronics, Elyria, OH 44036 216-366-6330
ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
§ Air Electro Inc., Van Nuys, CA 91406 ..... 213-873-6400;818-988-4400
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
Cambridge Products, Bloomfield, CT 06002 ..... 203-243-1761, 800-243-8814
§† Cinch Connector Division, Labinal Components & Systems Inc, Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§† DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
Elform, Inc., Reno, NV 89510 702-356-1734
§ Erni Components, Richmond, VA 23236 804-794-6367
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
GTE Products Corp., Williamsport, PA 17701 717-326-6591
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§ ICC, Inc., Orange, CA 92665 714-998-8310
ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
International Mircoelectronics, Arlington, TX 76003 817-561-2244
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 213-328-0051
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§† Microtech, Boothwyn, PA 19061 215-459-3566
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§† Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Patton-MacGuyer Inc., Providence, RI 02905 401-941-6000
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
Remee Products Corp., Florida, NY 10921 914-651-4431
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
Rogers Corp., Rogers, CT 06263 203-774-9605
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960

§† Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Square D Co., Palatine, IL 60067 312-397-2600
Standex Electronics, Standex International, Cincinnati, OH 45209 513-871-3777
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§† Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ U.S. Components, Inc., Unitech PLC, Bohemia, NY 11716 516-589-3080
§ Vaco Products, Chicago, IL 60645 312-677-9500
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

Connectors, Splicing-2100

AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
† Accurate Electronics, Elyria, OH 44036 216-366-6330
Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9800
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Pyle-National Division, BRintec Corp., Chicago, IL 60651 312-342-6300
Remee Products Corp., Florida, NY 10921 914-651-4431
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136

Connectors, Stripline-2100

AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
Auget, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1260,1284
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1916
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
AMP, Harrisburg, PA 17105 717-564-0100
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 203-743-9272
§† Applied Engineering Products, New Haven, CT 06525 203-387-5282
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Elastomeric Technologies, Inc., Hatboro, PA 19040 ..... 215-672-0787;215-672-4741
Eliorm, Inc., Reno, NV 89510 702-356-1734
§† EMC Technology Inc, Cherry Hill, NJ 08034 609-429-7600
Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§ Emi Components, Richmond, VA 23236 804-794-6367
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
MACOM, Inc., Burlington, MA 01803 617-272-3000
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
† Micro Mode Prods., El Cajon, CA 92020 619-449-3844
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Rogers Corporation, Flexible Interconnections Div., Chandler, AZ 85244 602-963-4584
§† Solitron/Microwave, Solitron Devices, Inc., Riviera Bch., FL 33404-9978 407-848-4311
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136
§ Wilfron, Morgan Hill, CA 95037-2809 408-778-2000

Connectors, Surface Mount-2100

† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Bussmann:Cooper Industries, St. Louis, MO 63178, 314-394-2877 ..... C•1295
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1318-1319
§ CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1323
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1383
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1388-1389
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1442
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1381
§ The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... D•2241
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466
Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
§ Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... C•1538-1541
† Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... C•1542
Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 203-743-9272
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UY 0-628-810810
DuPont Electronics, Wilmington, DE 19890-0013 800-237-4357
§ Edac Inc., Scarborough, Ont, CAN M1V 5B6 416-754-3322
Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
Eliorm, Inc., Reno, NV 89510 702-356-1734
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
§ Fujitsu of America, Santa Clara, CA 95054 408-562-1000
GTE Products Corp., Williamsport, PA 17701 717-326-6591
§ Holmberg Elctrns., Inman, SC 29349 803-472-4141
Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
International Configurations, Inc., Enfield, CT 06082 203-749-6380
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
MACOM, Inc., Burlington, MA 01803 617-272-3000
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Methode Electronics, Inc., Interconnect Prods Div., Rolling Meadows, IL 60008 312-392-3500
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 215-699-5373
Middleberg Corporation/Middox Connectors, Canton, CT 06019 203-693-8361
† Mini-E-Con, Irvine, CA 92714 714-250-0474
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330

Connectors, Test-2100

AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Components Corp., Denville, NJ 07834, 201-627-3280 ..... C•1311
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180, 605-665-9301 ..... C•1325
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1346
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... C•1350-1352
Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213 ..... C•1372
§ Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1395
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1455,1457
§ The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... C•1463, D•2241
Oxley, Inc., Branford, CT 06405, 203-488-1000 ..... C•1455
§ Pomona Electronics, Pomona, CA 91765, 714-623-3463 ..... C•1477,1623
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1565
† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
§† Air-O-Tronics, Trush Group, Cazenovia, NY 13035 315-655-2387
Alden Products Co., Brockton, MA 02403 508-583-0160
AMP, Harrisburg, PA 17105 717-564-0100
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
† Amel Electronics, N. Bergen, NJ 07047 201-869-4201
§ Augat/Fylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6671
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
§ GC-Thorsen, Rockford, IL 61108-1209 815-968-9661
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
† Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Jetiron Products Inc., E. Hanover, NJ 07936 201-887-0571
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
† Mac Panel Co., High Point, NC 27264 919-884-8111
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000
Mouser Electronics, Mansfield, TX 76063 800-346-6873
† Narda Microwave Corp., Subsidiary of Loral Corp., Hauppauge, NY 11788 516-231-1700

National Tel-Tronics, Meadville, PA 16335 814-724-6440
PCD, Peabody, MA 01960 508-532-8800
Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Russtech Engineering Company, Inc., Mission Viejo, CA 92691 714-472-0880
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
Virginia Panel, Waynesboro, VA 22980 703-949-8376
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

Connectors, Thermocouple-2100

§† Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 ..... C•1353,1355,1359
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
† Alberox Corporation, New Bedford, MA 02745 508-995-1725
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
Anasco Corporation, Danvers, MA 01923 ..... 800-826-2726;508-777-8888
Ceramaseal, New Lebanon, NY 12125 518-794-7800
† Connector Industries of America Div., Microdot Mfg., Cincinnati, OH 45215 513-733-3680
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ GIC Thermodynamics, Royal Oak, MI 48073 313-280-1648
§† Gordon Co.:Watlow, Richmond, IL 60071 815-678-2211
† Gulton Industries, Inc., Servonic Div., Costa Mesa, CA 92627 ..... 714-642-2400; 800-854-4066
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ Love Controls Corp., Wheeling, IL 60090 312-541-3232
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Omega Engineering, Stamford, CT 06907 800-826-6342
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Pyrocom Co., Seattle, WA 98133 206-365-3535
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
Weidmuller, Inc., Richmond, VA 23236 804-794-2877

Connectors, Video-2100

Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996 ..... C•1349
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ..... C•1386
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1389
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402,1406-1408,1412
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
Fischer Connectors, Valencia, CA 91355 ..... 818-362-9395 ,800-344-0445
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
† Imtronics Industries, St. Petersburg, FL 33716 813-572-9010
§ International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020

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† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1706-1707
Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1293
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297,1299
DataCon, Inc., Burlington, MA 01803, 617-273-5800 ..... C•1725
§† DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1333
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1383
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1390
§ Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1396
Metuchen Capacitors, Inc., Old Bridge, NJ 08857, 201-679-3366 ..... C•1445
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466
§ Sullins Electronics Corp., San Marcos, CA 92069, 619-744-0125 ... C•1530-1531
§† Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 .... C•1538
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§† Air Electro Inc., Van Nuys, CA 91406 ..... 213-873-6400;818-988-4400
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§ Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
Chabin Corp., Chico, CA 95926 916-891-6410
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
§ Dale Electronics, Inc., Yankton Div., Yankton, SD 57078-0180 605-665-9301
Douglas Electronics, San Leandro, CA 94577 415-483-8770
§ EBY Company, Philadelphia, PA 19124 215-537-4700
§ Edac Inc., Scarborough, Ont., CAN M1V 5B6 416-754-3322
§† Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Erni Components, Richmond, VA 23236 804-794-6367
§† E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§ Fujitsu of America, Santa Clara, CA 95054 408-562-1000
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§† Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
Mac Panel Co., High Point, NC 27264 919-884-8111
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§† Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
MOLEX, Inc., Lisle, IL 60532 312-969-4550
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
Oxley, Inc., Branford, CT 06405 203-488-1033
§ PCD, Peabody, MA 01960 508-532-8800
§ Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
§† Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
§† Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
Urban Electronics, Dover, MA 02030 617-329-4068
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Viking Connetors Co., Criton Technoiogies, Chatsworth, CA 91311 818-341-4330
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136
§† Wire-Pro, Inc., Salem, NJ 08079 ..... 609-935-7601;609-935-7651

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† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1274,1277
Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1288
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1345

† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382-1385
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1390
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402,1406-1407
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438-1439
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... C•1881
Multi-Contact USA, Santa Rosa, CA 95401, 707-575-7575 ..... C•1460-1462
§ The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... D•2241
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1917
Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... C•1539,1541
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
Advanced Circuit Technology, Nashua, NH 03062 ..... 603-880-6000;800-234-FLEX
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
§ Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autoswage Products, Shelton, CT 06484 203-929-1401
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
CTS Corporation, Elkhart, IN 46514 219-293-7511
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
† CTS Corporation, Systems Division, Eden Prairie, MN 55344 612-941-9100
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
§ Emi Components, Richmond, VA 23236 804-794-6367
GTE Products Corp., Williamsport, PA 17701 717-326-6591
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
† Min-E-Con, Irvine, CA 92714 714-250-0474
§ PCD, Peabody, MA 01960 508-532-8800
§† Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
Security Plastics, Inc., Miami Lakes, FL 33014 305-823-5440
Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100

Connectors & Terminals, Push-on, Quick Disconnect-2100

Air Electro Inc., Van Nuys, CA 91406, 213-873-6400;818-988-4400 ..... C•1310
§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1289
§ Beau Products Div., Vernitron Corp., Leconia, NH 03247, 603-524-5101 ..... C•1290
Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1304
† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314-1315
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1331-1332,1337-1338,1341-1342
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382-1383,1385
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1404,1406-1407
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1439
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... C•1881
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1506-1507
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517-1519
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ..... C•1525
Virginia Plastics Co., Roanoke, VA 24015-0577, 703-375-0100 ..... C•1560-1561
§ Visual Communications Co., Inc., San Diego, CA 92126, 619-549-6900 ..... B•1199-1203
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1563,1565,1567,1569-1570,1572-1573
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§ Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... C•1579
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
† Accurate Electronics, Elyria, OH 44036 216-366-6330
ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§ Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 203-743-9272
§ Anderson Power Products, Div. of High Voltage Engineering, Boston, MA 02135 617-787-5880
§ Ark-Les, Watertown, MA 02172 617-924-2330
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
† Bird Electronic Corp., Cleveland, OH 44139-2794 216-248-1200
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Cosmo Corporation, Cleveland, OH 44109 216-861-5594
Curtis Industries, Milwaukee, WI 53218-0699 414-535-1500
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§† Elcon Products International Company, Fremont, CA 94538 415-490-4200
† Electronic Essentials, Woodside, NY 11377 718-898-8300
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§† E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
§ ICC, Inc., Orange, CA 92665 714-998-8310
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ International Components Corp., Melville, NY 11747 516-293-1500
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
MACOM, Inc., Burlington, MA 01803 617-272-3000
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Marathon Special Prods., Bowling Green, OH 43402 419-352-8441
§ Martin Sound Prods. Inc., Cleveland, OH 44143-2297 216-442-2286
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 215-489-3700
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 215-699-5373
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
Oxley, Inc., Branford, CT 06405 203-488-1033
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Patton-MacGuyer Inc., Providence, RI 02905 401-941-6000
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
§ PTS Corporation, Bloomington, IN 47401 812-824-9331
Pyle-National Division, BRIntec Corp., Chicago, IL 60651 312-342-6300
§ Reliance Comm/Tec, Reliance Electric, Cleveland, OH 44199 800-245-4501
§ RMS Company, Connector Division, Minneapolis, MN 55432 612-786-1520
§ Rye Industries, Inc., Mamarcneck, NY 10543 914-698-0080
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
Staffall Inc., Cranston, RI 02910 401-461-5554
Standex Electronics, Standex International, Cincinnati, OH 45209 513-871-3777
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
§† Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Tricon Industries, Inc., Electromechanical Division, Downers Grove, IL 60515-4076 312-964-2330
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ USD Products, Cooper Industries, Chicago, IL 60656 312-867-4600
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
§ Vaco Products, Chicago, IL 60645 312-677-9500
Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330

§ Wago Corp., Brown Deer, WI 53223 414-354-5511
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000

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Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ..... C•1720-1721,1748
Accurate Electronics, Elyria, OH 44036 216-366-6330
Airflyte Elctrns. Co., Bayonne, NJ 07002 201-436-2230
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
§ Hugin Industries Inc., Los Altos, CA 94022 415-961-2950
Instrument Specialties Co., Delaware Water Gap, PA 18327 717-424-8510
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Mantex Corp., Oxford, MI 48051 313-628-8200
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Micro-Products Engineering Co., Newark, NJ 07108 201-824-8467
§ Simco Co., Hatfield, PA 19440 215-822-2171
§ Tapeswitch Corp. of America, Farmingdale, NY 11735 516-694-6312
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800

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Contacts, Brush-2500

The J. M. Ney Company, Bloomfield, CT 06002 203-242-2281

Contacts, Electrical-2500

† AirBorn, Inc., Addison, TX 75001-0519, 214-931-3200 ..... C•1132
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571, 203-334-4124 ..... C•1615
§ Components Corp., Denville, NJ 07834, 201-627-0290 ..... C•1311,1616
CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1321
† Graphite Metallizing Corp., Yonkers, NY 10702, 914-968-8400 ..... B•1252
Hasco Components, Inc., Bellrose Village, NY 11001, 516-328-9292 ..... B•1752
§ Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213 .. C•1372-1375
† Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 ..... C•1382-1385
† Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727 ..... C•1123
§† Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... C•1881
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... C•1463,1619, D•2241
Precision Interconnect, Portland, OR 97224, 503-620-9400 ..... C•1917
Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578, 312-438-4000 ..... C•1514
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
† Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ..... C•1720-1721
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† Air Electro Inc., Van Nuys, CA 91406 ..... 213-873-6400;818-988-4400
Airflyte Elctrns. Co., Bayonne, NJ 07002 201-436-2230
Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§† Amphenol, Bendix Connector Operations, Sidney, NY 13838 607-563-5011
§ Arrow Hart Components, Cooper Industries, Charlottesville, VA 22906-9050 804-974-5100
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
Augat Inc., Attleboro, MA 02703 617-222-2202
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
† Danmar Inds., Chatsworth, CA 91311 ..... 818-882-7979/5280
Deringer Mfg. Co., Mundelein, IL 60060 312-566-4100
§ Eaton Corp./Cutler-Hammer Prods, Aerospace & Commercial Controls Div., Milwaukee, WI 53216 414-449-7487
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
Everett/Charles Contact Products, Pomona, CA 91767 714-625-5551
Everett/Charles Test Equipment, Inc., Pomona, CA 91767 714-621-9511
§ Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ ICC, Inc., Orange, CA 92665 714-998-8310
§† Industrial Electronic Hardware Corp., (IEH Corp.), New York, NY 10012 212-677-1881
Instrument Specialties Co., Delaware Water Gap, PA 18327 717-424-8510
§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
§† Methode Electronics, Inc., Chicago, IL. 60656 312-867-9600
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
Stackpole, Carbon Div., St. Marys, PA 15857 814-781-1234
Staffall Inc., Cranston, RI 02910 401-461-5554
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§† Superior Carbon Products, Inc., Walnut Grove, MS 39189 601-253-2442
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
Texas Instrs., Inc., Dallas, TX 75380 ..... 800-232-3200 (ext 700)
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Tricon Industries, Inc., Electromechanical Division, Downers Grove, IL 60515-4076 312-964-2330
§ U.S. Components, Inc., Unitech PLC., Bohemia, NY 11716 516-589-8080
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000

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† Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1095-1096
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242-2243
† Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
§ Akro-Mils, Akron, OH 44301 216-253-5593
† American Aluminum, Mountainside, NJ 07092 201-233-3500
† Anvil Cases, Inc., Rosemead, CA 91770 ..... 818-575-8614;800-242-4466; 800-423-4279(outside CA)
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
† ECS Composites, Grants Pass, OR 97526 503-476-8871
§ Flambeau Products Corp., Middlefield, OH 44062 216-632-1631
† Gemini, Cannon Falls, MN 55009 ..... 507-263-3957;800-533-3631
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
§ Lyon Metal Products, Aurora, IL 60507 312-892-8941
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Mercury Plastics, A Unit of Zero Corp., Chicopee, MA 01020 413-267-5561
Metric Systems, Ft. Walton Beach, FL 32548-9990 904-244-9600
† MFG, Parabam Div., Carson, CA 90745 213-549-5044
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
† United Foam Plastics, Georgetown, MA 01833 508-352-2200
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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† Marlow Industries, Inc., Dallas, TX 75238-1645, 214-340-4900 ..... C•1672-1673
† Melcor/Materials Elctrn. Prods., Trenton, NJ 08648, 609-393-4178 .. B•1904-1905
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... B•1989
TECA, ThermoElectric Cooling America Corp., Chicago, IL 60622, 312-666-1600 ..... C•1690
§ Allen Co., Inc., Robert G., N. Hollywood, CA 91605 ..... 818-765-8300; 800-999-3711
§ Casso-Solar, Pomona, NY 10970 914-354-2500
† EG & G Rotron, Custom Div., Woodstock, NY 12498 914-679-5201
† Noren Products Inc., Menlo Pk., CA 94025 415-322-9500
Products for Research, Danvers, MA 01923 508-774-3250
§ Temptronic Corporation, Newton, MA 02158 617-969-2501
Thermacore Inc., Lancaster, PA 17601 717-569-6551
Thomson Electron Tubes & Devices Corp., Special Products Div., Dover, NJ 07801 201-328-1400

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§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... C•1826
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. C•1848
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† Amrad & Transcon Mfg. Co., Div. of D.J. Assocs., Inc., Fort Smith, AR 72903-7045 501-452-3987
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760
§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... C•1822
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** ..... C•1848,1850,1852
General Cable Co., Kenly, NC 27542, 919-284-5144 ..... C•1855-1857
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1416,1429, 1872
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1470,1474,1910-1911,1913-1914
§ **Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722** ..... C•1916
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ..... C•1525-1526,1920-1921
§ **Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700** ..... C•1533
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Concept Industries, App-Rep, Inc., Pico Rivera, CA 90660 ..... 213-699-0918; 800-255-2666
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§† Excel Specialty Corp., Chicago, IL 60660 312-262-4781
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
International Configurations, Inc., Enfield, CT 06082 203-749-6380
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ McGill Manufacturing Co., Inc., Valparaiso, IN 46383 219-465-2200
Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ SL Waber, Inc., Mt. Laurel, NJ 08054 ..... 609-866-8888;800-257-8384
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Todd Systems, Inc., Yonkers, NY 10701 914-963-3400
§† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

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Cords, Line, Resistance-6000

§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100

Cords, Patch-2100

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760-1761
† **Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103** ..... C•1308
§ **Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571** ..... C•1313,1617
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. C•1848
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1338
§ **E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175** ..... C•1350-1352
§ **Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225** ..... C•1457
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1914
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... C•1477,1623
Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1916
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ..... C•1525,1920-1921
† **Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069, 818-707-2020** ..... C•1554
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Brooks Electronics, Philadelphia, PA 19140 215-228-4433
§† Excel Specialty Corp., Chicago, IL 60660 312-262-4781
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
L-Com Inc., N. Andover, MA 01845 508-682-6936
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
† Mac Panel Co., High Point, NC 27264 919-884-8111
Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
† 3M Fiber Optic Products, Inc., W. Haven, CT 06516 203-934-7961
§ Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§† Probe Master, Inc., San Diego, CA 92111 ..... 619-560-9676;800-854-1519; 800-772-1519
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Tevelec, Ltd., Mississauga, Ontario, CANADA L4W 2W6 416-624-5241
§ Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
U.S. Terminals, Cincinnati, OH 45243 513-561-8145

Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
† Virginia Panel, Waynesboro, VA 22980 703-949-8376

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1762
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ..... C•1763
§ **Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1** ..... C•1763
Brim Electronics, Fair Lawn, NJ 07410, 201-796-2586 ..... C•1822
Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1852
D & B Power, Inc., Bayshore, NY 11706, 516-586-5955 ..... D•1717
General Cable Co., Kenly, NC 27542, 919-284-5144 ..... C•1855-1857
§ **Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246** ..... C•1859
Jerome Industries Corp., Elizabeth, NJ 07201, 201-353-5700 ..... D•1938-1939
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1872
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1470,1474,1910-1914
Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1508
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1952-1953
ebm Industries, Inc., Farmington, CT 06032 203-674-1515
International Configurations, Inc., Enfield, CT 06082 203-749-6380
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700

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§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1821-1822
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850-1852
Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246 ..... C•1859
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... C•1869
National Wire & Cable Corp., Los Angeles, CA 90031-1700, 213-225-5611 ..... C•1895
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
§ Concept Industries, App-Rep, Inc., Pico Rivera, CA 90660 ..... 213-699-0918; 800-255-2666
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-3476
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
Interelectronics Corp., Congers, NY 10920 ..... 914-ELB-8000
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Meyer Wire & Cable Co., Div. of Cole Hersee Co., Hamden, CT 06514 203-281-0817
MOLDCON Div. of Contex Electronics, W. Springfield, MA 01089 413-736-0071
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
† Shogyo International Corp., Great Neck, NY 11021 516-466-0911
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100

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§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ Carolina Steel & Wire, Lexington, SC 29072-0829 803-359-5501
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700

Cords & Cord Sets, Telephone-6000

§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1821-1822
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850,1852
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Motorola Semiconductor Prods. Sector, Phoenix, AZ 85018-6606, 602-244-6900 ..... A•1757
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Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
APX-Arstan Products International Inc., Jericho, NY 11753 516-333-8100
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ Concept Industries, App-Rep, Inc., Pico Rivera, CA 90660 ..... 213-699-0918; 800-255-2666
Connect-Air International, Inc., Auburn, WA 98002 206-939-4880
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ EFD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4637
Kaut & Bux Manufacturing Co, Mundelein, IL 60060 312-949-8505
Lance Industries, Sylmar, CA 91342-0153 818-367-1811
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Meyer Wire & Cable Co., Div. of Cole Hersee Co., Hamden, CT 06514 ... 203-281-0817
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Tevelec, Ltd., Mississauga, Ontario, CANADA L4W 2W6 416-624-5241
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

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ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
D & B Power, Inc., Bayshore, NY 11706, 516-586-5955 ..... D•1717
General Cable Co., Kenly, NC 27542, 919-284-5144 ..... C•1855-1857
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Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... C•1470,1474,1910-1912,1914
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1916
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ..... A•2441, C•1526
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
§ GC-Test, Timonium, MD 21093 301-252-1768
International Configurations, Inc., Enfield, CT 06082 203-749-6380
Kaut & Bux Manufacturing Co, Mundelein, IL 60060 312-949-8505
§ Pacific Electricord, Gardena, CA 90247 213-532-6600
§ Quelltek Electronics Corp, Mentor, OH 44060 216-951-3300
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

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Cores, Magnetic, Powdered Iron, Toroid-1850 — *See Vol. A*

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Couplings, Quick-disconnect, Liquid or Gas-2500

§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
§ Snaptite/Allied, Erie, PA 16505 814-833-6131
Vactronic Lab. Equip. Inc., Bohemia, NY 11716 516-567-0520

Couplings, Shaft, Rigid & Flexible-2400

§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§† Micro Mo Electronics, Inc., St. Petersburg, FL 33701, 813-822-2529 ..... B•1966, D•2245
Accurate Electronics, Elyria, OH 44036 216-366-6330
Alpha-Tech Inc., Riverdale, NJ 07457 201-831-1222
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
† Dial Products Co., Bayonne, NJ 07002 ..... 201-HE7-0720
EI & S Corporation, Stoneham, MA 02180 617-438-5300
§ Foredom Elec. Co., Blackstone Inds. Inc., Bethel, CT 06801 203-792-8622
Helical Prods. Co., Inc., Santa Maria, CA 93456-1069 805-928-3851
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Machine Components Corp., Plainview, NY 11803 516-694-7222
§ Naugler Engineering, Inc., Beverly, MA 01915 617-922-5634
† Perfect Gear & Instrument, Designatronics, Inc., New Hyde Park, NY 11040 516-328-3300
† PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Precision Mechanisms, Westbury, NY 11590 ..... 516-ED3-5955
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§ Vemaline Prods. Div., Warwick, RI 02887 401-739-7600

Covers, Protective (Incl. Dustcovers)-1400

Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1035
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1095-1097
STRONGBOX, Culver City, CA 90231-2726, 213-305-8288 ..... C•1100-1101
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
§ Amherst International Corp., Cover Craft Div., Manchester, NH 03101 ..... 603-644-3555; 1-800-547-5600
Augat/RDI, Carol Stream, IL 60188 312-682-4100
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
§ Heath Co., St. Joseph, MI 49085 616-982-3200
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Leader Instruments Corp., Hauppauge, NY 11788-3694 516-231-6900
§ Potter & Brumfield, A Siemens Co., Princeton, IN 47671-0001 812-386-1000
† Precision Tech. Sewing, Palo Alto, CA 94303 415-856-2128
§ Schrack North America Corp., Ronkonkoma, NY 11779-7209 516-737-0099
§† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717
§ Zero Corp., Burbank, CA 90503 818-846-4191
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561
§ Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842

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§ Bivar, Inc., Irvine, CA 92718 714-951-8808
† Globe Plastics, Pomona, CA 91766 714-623-2747
† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
† Moldtronics, Inc., Downers Grove, IL 60515 312-968-7000
§ Morris Enterprises, Sepulveda, CA 91343 818-894-9103
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Robison Electronics, San Luis Obispo, CA 93403-8121 805-544-8000
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140

Curing Systems, Photo Magnetic-1600

Xenon Corp., Woburn, MA 01801 617-938-3594

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† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
AMP, Harrisburg, PA 17105 717-564-0100
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
Contact East, N. Andover, MA 01845 508-682-2000
§ Edsyn, Inc., Van Nuys, CA 91406 ..... 818-989-2324;213-873-5115
ELVO:Division of Zumbach Electronics Corporation, Mt. Kisco, NY 10549 914-241-1008
§ Eraser Co., Syracuse, NY 13221 315-454-3237
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ General Hardware Mfg., New York, NY 10013 212-431-6100
§ GreenLee Textron Inc.:Subsidiary of Textron Inc., Rockford, IL 61109 ... 815-397-7070
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Multicore Solders, Westbury, NY 11590 516-334-7997
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§ Pioneer Components, Brooklyn, NY 11234 718-444-3880
§ Plato Products, Inc., Glendora, CA 91740 800-423-4510
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Vaco Products, Chicago, IL 60645 312-677-9500
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

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Decade Boxes, Transformer-2900 — ***See Vol. D***

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§† **Datak Corp., N. Bergen, NJ 07047, 201-863-7667** ..... **C•1584,1726**
Memtron Technologies, Inc., Frankenmuth, MI 48734, 517-652-2656;800-234-7525 ..... **B•1878**
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Markem Corp., Keene, NH 03431 603-352-1130
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§† Miller Dial Corp., El Monte, CA 91731 818-444-4555
Stanpat Prods., Port Washington, NY 11050 516-883-8400
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
† Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386

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§ **Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800** ..... **C•1586**
† **Kilo International, La Verne, CA 91750, 714-593-4626** ..... **A•2113**
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† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
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§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Clarostat Mfg. Co., Inc., Hawker Siddeley, PLC., Dover, NH 03820 603-742-1120,800-872-0042
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§† Davies, Harry, Molding Co., Chicago, IL 60639 312-622-8966
§† Electronic Hardware, Farmingdale, NY 11735 516-752-1950
† Hallmark Nameplate, Inc., Farmingdale, NY 11735 800-645-9502
† Hornalite, Inc., Wilmington, DE 19804 302-652-3686
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§ Jumo Process Control, Inc., Bergenfield, NJ 07621 201-501-0060
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
LaFrance Corp., Philadelphia, PA 19153-3893 215-365-8000
§ LFE, Instruments Div., Clinton, MA 01510-3099 508-835-1000
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
§ NOBEX Div., Griffith Plastics Corp., Burlingame, CA 94010 415-342-8170
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† Perfect Gear & Instrument, Designatronics, Inc., New Hyde Park, NY 11040 516-328-3300
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Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§† Rogan, Northbrook, IL 60062 ..... 312-498-2300;800-423-1543
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SPS Inc. (Muirhead Vactric), Springfield, NJ 07081 201-376-1222
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk., NY 11040 ..... 516-328-0200;328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§ Triplett Corporation, Bluffton, OH 45817-9987 419-358-5015
§† Vernaline Prods. Div., Warwick, RI 02887 401-739-7600

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§ **Bourns, Inc., Resistive Components Group, Riverside, CA 92507, 714-781-5050** ..... **A•2084**
§ **ETI Systems, Polaris Indl. Entprs., Oceanside, CA 92054, 619-757-7770** ..... **A•2109, B•1242-1244**
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... **C•1586**
† **Kilo International, La Verne, CA 91750, 714-593-4626** ..... **A•2113**
† **Litton Potentiometer Div., Mt. Vernon, NY 10551, 914-664-7733** ..... **A•2119**
§ Clarostat Mfg. Co., Inc., Hawker Siddeley, PLC., Dover, NH 03820 603-742-1120,800-872-0042
§ Cosmo Corporation, Cleveland, OH 44109 216-861-5594
Front Panel Devices, Inc., Ronkonkoma, NY 11779 516-737-3322
Harrel, Inc., E. Norwalk, CT 06855 203-866-2573
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Microavionics Corp., Costa Mesa, CA 92626 714-957-6904
§ Ragen Data Systems, Inc., Central Islip, NY 11722 516-234-3800
§ Spectrol Electronics, City of Industry, CA 91745 818-964-6565

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Dispensers, Adhesive-1600

§† Automation Unlimited, Icon Corporation, Woburn, MA 01801 617-933-7288
Contact East, N. Andover, MA 01845 508-682-2000
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§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
§ IVEK Corp., N. Springfield, VT 05150 802-886-2238
§† Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Roean Industries, Inc., Pacoima, CA 91331 818-767-7047
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§ Zevatech, Inc., Morrisville, NC 27560 919-460-0111

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Drafting Machines-4200

Applied Software Tech., Inc., Atlanta, GA 30329 404-663-8660

Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Incl. Lettering)-4200

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Stanpat Prods., Port Washington, NY 11050 516-883-8400

Drawers, Sliding-1400

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Crissman Manfacturing Co., Huntley, IL 60142, 312-669-3995 ..... **C•1020**
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† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... **C•1062**
§ Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... **C•1083**
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Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
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Contact East, N. Andover, MA 01845 508-682-2000
§ Foredom Elec. Co., Blackstone Inds. Inc., Bethel, CT 06801 203-792-8622
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§ General Hardware Mfg., New York, NY 10013 212-431-6100
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§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
MMI-Mirco Machines, Inc., Santa Clara, CA 95052 408-727-0100
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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Drivers, Nut-5400

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§† Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Vaco Products, Chicago, IL 60645 312-677-9500

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§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... **C•1586**
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† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk., NY 11040, 516-328-0200;328-3300 ..... **B•1305**
§† Bailey Controls Co., Div. of Babcox & Wilcox, Wickliffe, OH 44092 216-585-8500
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Fujitsu America, Inc., Computer Products Group, San Jose, CA 95134 ... 408-432-1300
§ Machine Components Corp., Plainview, NY 11803 516-694-7222
NIDEC Corporation, Torrington, CT 06790 203-482-4422
† Perfect Gear & Instrument, Designatronics, Inc., New Hyde Park, NY 11040 516-328-3300
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Reproduction Technologies Inc., Bristol, IN 46507-0518 219-848-5233
Sprague Electric Company, The Semiconductor Group, Worcester, MA 01613-2036 617-853-5000
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
† Transicoil, Inc., Worcester, PA 19490-9990 215-277-1300
§† Vemaline Prods. Div., Warwick, RI 02887 401-739-7600

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§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... **C•1909**
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ DEK Inc., St. Charles, IL 60174 312-377-2575
§ Gould Shawmut, Newburyport, MA 01950 ..... 508-462-6662/3131
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
POLYCASE PRODS., ECP Corp., Cleveland, OH 44103 216-391-0444
§ Square D Co., Palatine, IL 60067 312-397-2600
§ Syracuse Elctrns. Div. of Pass & Seymour, Syracuse, NY 13221 315-488-4911
§ The Wiremold Company, W. Hartford, CT 06110 203-233-6251

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† Comatel USA, Inc., Danbury, CT 06810 203-797-9445
NEC Electronics, Inc., Mountain View, CA 94039 415-960-6000

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† AMP, Harrisburg, PA 17105, 717-564-0100 ..... **C•1157**
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§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600

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† Amco Engineering, Schiller Pk., IL 60176, 312-671-6670;800-833-3156 ..... C•1006-1007,1009
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§† Compac, Holbrook, NY 11741, 516-585-3400 ..... C•1016-1019
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§ Hammond Manufacturing Co., Buffalo, NY 14225, 716-894-5710 ..... C•1057
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§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
ADAC Corp., Woburn, MA 01801 617-935-6668
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alusett U.S.A., Inc., Pleasantville, NY 10570 914-747-3477
§ Amerex, Riverside, CA 92516 714-686-1400
† American Aluminum, Mountainside, NJ 07092 201-233-3500
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
Atlas/Soundolier, Fenton, MO 63026 314-349-3110
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
§ Automatic Switch Co., Florham Park, NJ 07932 1-201-966-2000
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523 415-932-3911
† Calmark Corp., San Gabriel, CA 91776 818-287-0451
† Contours Inc., Meriden, CT 06450 203-237-8331
Controls Unlimited, Inc., Perry, OH 44081 216-259-2500
Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
§ Data Translation, Inc., Marlboro, MA 01752 508-481-3700
D. L. Custom, Markham, Ont, CANADA L3R 2M5 416-475-0275
Douglas Electronics, San Leandro, CA 94577 415-483-8770
§ Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
§† E-Tronics, Sepulveda, CA 91343 818-892-7279
† Force, Inc., Christiansburg, VA 24073 703-382-0462
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
§ Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
Hallmark Metals Inc., Glendora, CA 91740 213-335-1263
† Hamilton Metalcraft, Pasadena, CA 91103 818-795-4811
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
Hudson Industries, Hudson, NH 03051 603-880-7712
† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
Hybricon Corporation, Ayer, MA 01432 508-772-5422
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Kinetic Systems Corp., Lockport, IL 60441 815-838-0005
§ Line Electric Products, Hartford, CT 06141 ..... 203-659-3573;1-800-331-1137
Mallory Capacitor Co., Emhart Elctrl./Elctm. Grp., Indianapolis, IN 46241 317-856-3731
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Miller, W. A., Co., Oquossoc, ME 04964-0337 ..... 207-864-3344;800-227-1415
Mouser Electronics, Mansfield, TX 76063 800-346-6873
MRL, Missouri Research Labs., St. Charles, MO 63301 .. 314-946-6900;1-800-325-0223
Octagon Systems, Westminster, CO 80030 303-426-8540
§ Opto 22, Huntington Bch., CA 92649 714-891-5861
§ Pomona Electronics, Pomona, CA 91766 714-623-3463
† Princeton Case Co., Inc., Union, NJ 07083 201-687-1750
Pro-Log, Monterey, CA 93940 408-372-4593
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Prototek, Inc., Hamilton, OH 45015 513-874-5094
† Reeves-Hoffman Div., Dynamics Corporation of America, Carlisle, PA 17013 717-243-5929
Ren Electronics Corporation, C.C.G., An Insico Co., S. Hadley, MA 01075 413-536-1800
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
Suckle Corp., Scranton, PA 18505 717-346-3871
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
§ Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
Teradyne Connection Sys., Nashua, NH 03060 603-889-5156
Thermotech Div. of Menasha Corp., Hopkins, MN 55343 612-933-9400
§ Time Mark Corp., Tulsa, OK 74116 918-438-1220
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
Vector Electronic Co., Sylmar, CA 91342 818-365-9661
Virginia Panel, Waynesboro, VA 22980 703-949-8376
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
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† **Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE** ..... **C•1095,1097**
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† **STRONGBOX, Culver City, CA 90231-2726, 213-305-8288** ..... **C•1100-1101**
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† **Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR** ..... **C•1105-1108**
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§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
§ Action Instruments, San Diego, CA 92123 619-279-5726
ADAC Corp., Woburn, MA 01801 617-935-6668
Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
Advance, A Unit of Zero Corporation, N. Hollywood, CA 91605 818-983-0333
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Alusett U.S.A., Inc., Pleasantville, NY 10570 914-747-3477
§ Amerex, Riverside, CA 92516 714-686-1400
§† American Aluminum, Mountainside, NJ 07092 201-233-3500
Ango Electronics Corp., Harrison, NJ 07029 201-484-1115
† Anvil Cases, Inc., Rosemead, CA 91770 ..... 818-575-8614;800-242-4466; 800-423-4279(outside CA)
Arrem Plastics, Inc., Addison, IL 60101 312-628-2450
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
Atlas/Soundolier, Fenton, MO 63026 314-349-3110
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
§ Automatic Switch Co., Florham Park, NJ 07932 1-201-966-2000
Axis Corporation, San Diego, CA 92111 619-560-7737
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523 415-932-3911
§ C&D Charter Power Systems, Plymouth Meeting, PA 19462 215-828-9000
† Churchill Corp., Melrose, MA 02176 617-665-4700
† Contours Inc., Meriden, CT 06450 203-237-8331
Controls Unlimited, Inc., Perry, OH 44081 216-259-2500
† Craig Systems Corp., Hanson Industries, Amesbury, MA 01913-4848 508-388-5662
Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
§ Cross Brothers, Inc., Los Angeles, CA 90040 213-266-2000
† Dahlstrom of Canada Ltd., Toronto, Ontario, CANADA M4G 37E 416-421-5900
Douglas Electronics, San Leandro, CA 94577 415-483-8770
† ECS Composites, Grants Pass, OR 97526 503-476-8871
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
† Enclosure Corp., Bristol, PA 19007 215-785-2900
§† E-Tronics, Sepulveda, CA 91343 818-892-7279
Everest Electronic Equipment, Inc., Anaheim, CA 92806 714-634-2200
Front Panel Devices, Inc., Ronkonkoma, NY 11779 516-737-3322
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
† Hamilton Metalcraft, Pasadena, CA 91103 818-795-4811
§ Harris Corp., Dracon Div., Camarillo, CA 93010 805-987-9511
Heeger, Inc., Los Angeles, CA 90023 ..... 213-261-0382;213-261-0383
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
§† Holiday-Hammond Corp., Waco, TX 76701 817-756-7401
† House of Metal Enclosures, Hermann, MO 65041 314-486-3111
Hudson Industries, Hudson, NH 03051 603-880-7712
§ IEE (Industrial Electronic Engineers), Van Nuys, CA 91405 818-787-0311
† Innovatek Microsystems, Inc., Millerton, NY 12546-9720 914-373-9003
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Langley:Fleet Aerospace, Inc., San Diego, CA 92112 619-264-3181
LMB Heeger, Inc., Los Angeles, CA 90023 213-261-0382
Mallory Capacitor Co., Emhart Elctrl./Elctrn. Grp., Indianapolis, IN 46241 317-856-3731
Mantex Corp., Oxford, MI 48051 313-628-8200
Matrix Corp., Raleigh, NC 27610 919-833-2000
Midget Louver, Norwalk, CT 06852 203-866-2342
† Miller, W. A., Co., Oquossoc, ME 04964-0337 ..... 207-864-3344;800-227-1415
Parsons Manufacturing, Menlo Park, CA 94025-1476 415-324-4726
Powerbox Inc., Boulder, CO 80302 ..... 303-444-1461;800-444-1461
† Princeton Case Co., Inc., Union, NJ 07083 201-687-1750
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Recortec, Inc., Sunnyvale, CA 94086 408-737-8441
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
Stanley-Vidmar, Stanley Works, Allentown, PA 18103 215-797-6600
Suckle Corp., Scranton, PA 18505 717-346-3871
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
§ Ten-Tec, Inc., Sevierville, TN 37862 615-453-7172
§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
† Tridak, Brookfield, CT 06804 203-775-1287
Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
§† Vicon Industries, Inc., Melville, NY 11747 516-293-2200
§ Viking Cases, St. Petersburg, FL 33716 813-577-1216
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
Zero Corp., Burbank, CA 90503 818-846-4191
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

Enclosures, Instrument, With Integral Connectors-1400

Advance, A Unit of Zero Corporation, N. Hollywood, CA 91605, 818-983-0333 ..... **C•1099**
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... **C•1036-1037, D•1120-1121**
ILP Mfg. Inc., Downsview, Ont., CAN M3J 2N5, 416-667-9914 ..... **D•1012**
Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... **C•1062,1064**
PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... **C•1073-1074**
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... **C•1076**
Rittal Corp., Springfield, OH 45504, 800-637-4425 ..... **C•1086**
§ **Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO, 519-696-2616** ..... **C•1087**
§ **Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.)** ..... **C•1092**
† **Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE** ..... **C•1095-1097**
Stantron, Unit of Zero Corporation, N. Hollywood, CA 91605, 818-841-1825 ..... **C•1098**
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... **C•1110-1111**
† **U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503, 213-316-9984** ..... **C•1087**
Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... **C•1121**
Zero Corp., Burbank, CA 90503, 818-846-4191 ..... **C•1122**
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Amerex, Riverside, CA 92516 714-686-1400
Cardinal Prods., Inc., Santa Ana, CA 92704 714-546-1224
Crissman Manfacturing Co., Huntley, IL 60142 312-669-3995
D. L. Custom, Markham, Ont, CANADA L3R 2M5 416-475-0275
Electronic Enclosures, Div. Wyle Labs, El Segundo, CA 90245 213-643-8181
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
Hudson Industries, Hudson, NH 03051 603-880-7712
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
Matrix Corp., Raleigh, NC 27610 919-833-2000
§ Pomona Electronics, Pomona, CA 91766 714-623-3463
§ Precision Fabrication Technologies, Inc., Monon, IN 47959 ..... 1-800-558-7297; 219-253-6666
Raytheon Semiconductor, Mountain View, CA 94043 415-968-9211
§ Universal Data Systems, Inc., Motorola Information Systems Group, Huntsville, AL 35805-1953 205-721-8000

Enclosures, Keyboard-1400

§ **Bopla Enclosures, Frederick, MD 21701, 301-696-9300** ..... **C•1012**
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... **D•1120-1121**
Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... **C•1064**
§ **PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400** ..... **C•1067,1070-1072**
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... **C•1076**
§ **Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666** ..... **C•1079-1081**
§ **Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO, 519-696-2616** ..... **C•1087**
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... **C•1112**
† **U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503, 213-316-9984** ..... **C•1087**
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Arrem Plastics, Inc., Addison, IL 60101 312-628-2450
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
Electro Space Fabricators, Topton, PA 19562-0067 215-682-7181
† Hamilton Metalcraft, Pasadena, CA 91103 818-795-4811
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
Heeger, Inc., Los Angeles, CA 90023 ..... 213-261-0382;213-261-0383
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
LMB Heeger, Inc., Los Angeles, CA 90023 213-261-0382
Mantex Corp., Oxford, MI 48051 313-628-8200
Recortec, Inc., Sunnyvale, CA 94086 408-737-8441
§† Rose Enclosures Sys., Inc., Frederick, MD 21701 301-696-9800
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
Suckle Corp., Scranton, PA 18505 717-346-3871
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660

Enclosures, Nonmetallic-1400

§ **Altech Corp., Somerville, NJ 08876, 201-359-4454** ..... **C•1035**
§ **Bopla Enclosures, Frederick, MD 21701, 301-696-9300** ..... **C•1012**
§ **Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433** ..... **C•1013**
† **Gemini, Cannon Falls, MN 55009, 507-263-3957;800-533-3631** ..... **C•1054-1055**
§ **Hammond Manufacturing Co., Buffalo, NY 14225, 716-894-5710** ..... **C•1057**
IET Labs, Inc., Westbury, NY 11590, 516-334-5959 ..... **D•1286-1287**
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... **C•1586**
§ **PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400** ..... **C•1066-1067,1070-1074**
POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ... **C•1077**

§ Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO, 519-696-2616 ..... C•1087
Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.) ..... C•1092
† Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1095,1097
† Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1105-1107
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... C•1110
† U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503, 213-316-9984 ..... C•1087
Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
ADE, Inc., Chicago, IL 60633 312-646-3400
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Alpha Dist. Corp., Richfield, OH 44286 216-659-7100
§ Amerex, Riverside, CA 92516 714-686-1400
† Anvil Cases, Inc., Rosemead, CA 91770 ..... 818-575-8614;800-242-4466; 800-423-4279(outside CA)
Arrem Plastics, Inc., Addison, IL 60101 312-628-2450
Baker Co., Inc., Sanford, ME 04073 1-800-992-2537
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Cardinal Prods., Inc., Santa Ana, CA 92704 714-546-1224
† ECS Composites, Grants Pass, OR 97526 503-476-8871
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Flambeau Products Corp., Middlefield, OH 44062 216-632-1631
General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
Heeger, Inc., Los Angeles, CA 90023 ..... 213-261-0382;213-261-0383
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
§ IEE (Industrial Electronic Engineers), Van Nuys, CA 91405 818-787-0311
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
LMB Heeger, Inc., Los Angeles, CA 90023 213-261-0382
Mallory Capacitor Co., Emhart Elctrl./Elctrn. Grp., Indianapolis, IN 46241 317-856-3731
Mantex Corp., Oxford, MI 48051 313-628-8200
† Mercury Plastics, A Unit of Zero Corp., Chicopee, MA 01020 413-267-5561
† Miller, W. A., Co., Oquossoc, ME 04964-0337 ..... 207-864-3344;800-227-1415
Mouser Electronics, Mansfield, TX 76063 800-346-6873
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
Parsons Manufacturing, Menlo Park, CA 94025-1476 415-324-4726
Plastic Forming, Woodridge, CT 06525 203-397-1338
§ Pomona Electronics, Pomona, CA 91766 714-623-3463
† Premier Metal Prods. Co., Bronx, NY 10451 212-993-9200
† Princeton Case Co., Inc., Union, NJ 07083 201-687-1750
Raytheon Semiconductor, Mountain View, CA 94043 415-968-9211
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
§† Rose Enclosures Sys., Inc., Frederick, MD 21701 301-696-9800
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
† Terminal Data Corp., Rockville, MD 20855 301-921-8282
§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
Thermotech Div. of Menasha Corp., Hopkins, MN 55343 612-933-9400
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
United Foam Plastics, Georgetown, MA 01833 508-352-2200
† Vertox Co., Garden Grove, CA 92643 714-530-4541
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

Enclosures, Portable, Metallic & Nonmetallic-1400

Ango Electronics Corp., Harrison, NJ 07029, 201-484-1115 ..... C•1010
§ Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
Cabtron Systems, Inc., Northbrook, IL 60062, 312-498-6090 ..... C•1014
† ECS Composites, Grants Pass, OR 97526, 503-476-8871 ..... C•1022-1023
Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1028-1030
Electro Space Fabricators, Topton, PA 19562-0067, 215-682-7181 .. C•1033-1034
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ... C•1036, D•1120-1121
Emcor Products, Crenlo, Inc., Rochester, MN 55901, 507-289-3371 ..... C•1039
† Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ..... C•1040,1051
Everest Electronic Equipment, Lawrenceville, GA 30243, 404-995-8688 .. C•1055
† Gemini, Cannon Falls, MN 55009, 507-263-3957;800-533-3631 ..... C•1054
§ Hammond Manufacturing Co., Buffalo, NY 14225, 716-894-5710 ..... C•1057
IET Labs, Inc., Westbury, NY 11590, 516-334-5959 ..... D•1286-1287
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1065
§ PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... C•1066-1067,1070-1073
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... C•1076
POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ... C•1077
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
§ Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... C•1079-1080,1082
† Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1084-1085
Rittal Corp., Springfield, OH 45504, 800-637-4425 ..... C•1086
Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO, 519-696-2616 ..... C•1087
§ Rose Enclosures Sys., Inc., Frederick, MD 21701, 301-696-9800 ..... C•1088
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... C•1091
§ Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.) ..... C•1092
† Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1095-1097
Stantron, Unit of Zero Corporation, N. Hollywood, CA 91605, 818-841-1825 ..... C•1098
† STRONGBOX, Culver City, CA 90231-2726, 213-305-8288 ..... C•1100-1101
† Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1105-1106,1108
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... C•1111-1112
§ U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503, 213-316-9984 ..... C•1087
Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
§† Abalon Precision Mfg., Bronx, NY 10459 212-589-5682
Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
ADE, Inc., Chicago, IL 60633 312-646-3400
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
† Alden Products Co., Brockton, MA 02403 508-583-0160
§ Altech Corp., Somerville, NJ 08876 201-359-4454
† Amco Engineering, Schiller Pk., IL 60176 ..... 312-671-6670;800-833-3156
§ Amerex, Riverside, CA 92516 714-686-1400
† American Aluminum, Mountainside, NJ 07092 201-233-3500
Amherst International Corp., Cover Craft Div., Manchester, NH 03101 ..... 603-644-3555; 1-800-547-5600
† Anvil Cases, Inc., Rosemead, CA 91770 ..... 818-575-8614;800-242-4466; 800-423-4279(outside CA)
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
Baker Co., Inc., Sanford, ME 04073 1-800-992-2537
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Bopla Enclosures, Frederick, MD 21701 301-696-9300
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Cardinal Prods., Inc., Santa Ana, CA 92704 714-546-1224
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
† Craig Systems Corp., Hansen Industries, Amesbury, MA 01913-4848 508-388-5662
Crissman Manfacturing Co., Huntley, IL 60142 312-669-3995
§ Cross Brothers, Inc., Los Angeles, CA 90040 213-266-2000
§ Davies, Harry, Molding Co., Chicago, IL 60639 312-622-8966
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
Everest Electronic Equipment, Inc., Anaheim, CA 92806 714-634-2200
§ Ferno-Salesmaker, Ferno-Washington, Inc., Wilmington, OH 45177 513-382-1451
§ Flambeau Products Corp., Middlefield, OH 44062 216-632-1631
General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
§† Hardigg Inds., Inc., South Deerfield, MA 01373 413-665-2163
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
§† Holiday-Hammond Corp., Waco, TX 76701 817-756-7401
† House of Metal Enclosures, Hermann, MO 65041 314-486-3111
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
† Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Lectro Magnetics, Inc., Los Angeles, CA 90016 ..... 213-870-9383;(USA):800-325-9814; (CA):800-325-9815
McCoy Electronics Co., A Sub. of Oak Industries, Mt. Holly Springs, PA 17065 717-486-3411
† Mercury Plastics, A Unit of Zero Corp., Chicopee, MA 01020 413-267-5561
J. R. Merritt Controls, Inc., Stamford, CT 06902 203-359-2113
† Miller, W. A., Co., Oquossoc, ME 04964-0337 ..... 207-864-3344;800-227-1415
Parsons Manufacturing, Menlo Park, CA 94025-1476 415-324-4726
Plastic Forming, Woodridge, CT 06525 203-397-1338
Precision Tech. Sewing, Palo Alto, CA 94303 415-856-2128
† Princeton Case Co., Inc., Union, NJ 07083 201-687-1750
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Pylon Elex Development Co. Ltd., Lachine, PQ, CANADA H8S 1Z3 514-637-1186
† Reeves-Hoffman Div., Dynamics Corporation of America, Carlisle, PA 17013 717-243-5929
§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
Stanley-Vidmar, Stanley Works, Allentown, PA 18103 215-797-6600
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
Suckle Corp., Scranton, PA 18505 717-346-3871
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
§ Ten-Tec, Inc., Sevierville, TN 37862 615-453-7172
§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
† Trilobyte Computer Corporation, San Leandro, CA 94577 415-895-1100
Triplett Corporation, Bluffton, OH 45817-9987 419-358-5015
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
United Foam Plastics, Georgetown, MA 01833 508-352-2200
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Viking Cases, St. Petersburg, FL 33716 813-577-1216
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

Enclosures, Power Distribution-1400

E-T-A Circuit Breakers, Chicago, IL 60648, 312-647-8303 ..... B•1366
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401, 508-588-6110 ..... C•1060-1061,1716-1717
§ Pulizzi Engineering, Inc., Santa Ana, CA 92704-6865, 714-540-4229 ..... D•2229-2231
§ Altech Corp., Somerville, NJ 08876 201-359-4454
† Force, Inc., Christiansburg, VA 24073 703-382-0462

Enclosures, Shielded-1400

Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1035
† Amco Engineering, Schiller Pk., IL 60176, 312-671-6670;800-933-3156 ..... C•1008-1009
Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... C•1732
§† Compac, Holbrook, NY 11741, 516-585-3400 ..... C•1016-1018
D. L. Custom, Markham, Ont, CANADA L3R 2M5, 416-475-0275 ..... C•1021
† ECS Composites, Grants Pass, OR 97526, 503-476-8871 ..... C•1023
Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1028-1030
Electro Space Fabricators, Topton, PA 19562-0067, 215-682-7181 .. C•1033-1034
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... D•1120-1121
Emcor Products, Crenlo, Inc., Rochester, MN 55901, 507-289-3371 ..... C•1039
† Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ... C•1040,1050-1052
Everest Electronic Equipment, Lawrenceville, GA 30243, 404-995-8688 .. C•1053
† Gemini, Cannon Falls, MN 55009, 507-263-3957;800-533-3631 ..... C•1054-1055
† General Devices Co., Inc., Indianapolis, IN 46239-9632, 317-897-7000 ... C•1056
§ Hammond Manufacturing Co., Buffalo, NY 14225, 716-894-5710 ..... C•1057
IET Labs, Inc., Westbury, NY 11590, 516-334-5959 ..... D•1286-1287
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1745
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ... C•1062,1064-1065
§ PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... C•1066-1067,1070-1072
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... C•1076
† Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1084-1085
Rittal Corp., Springfield, OH 45504, 800-637-4425 ..... C•1086
§† Rose Enclosures Sys., Inc., Frederick, MD 21701, 301-696-9800 ..... C•1088
§ Serco Products Division:Serco Mold, Inc., Covina, CA 91723, 818-331-0517;800-843-8172(Calif.) ..... C•1092
† Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1095-1096
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... C•1110,1112
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§ Action Instruments, San Diego, CA 92123 619-279-5726
ADAC Corp., Woburn, MA 01801 617-935-6668
Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
§† Adams-Russell, Anzac Div., Burlington, MA 01803 671-273-3333
ADE, Inc., Chicago, IL 60633 312-646-3400
† Ad-Vance Magnetics, Inc., Rochester, IN 46975 219-223-3158
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Amerex, Riverside, CA 92516 714-686-1400
† American Aluminum, Mountainside, NJ 07092 201-233-3500
† Amuneal Manufacturing Corp., Philadelphia, PA 19124 215-535-3000
† Ark Elctrns. Corp., Southampton, PA 18966 215-322-6510
Arrem Plastics, Inc., Addison, IL 60101 312-628-2450
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
Baker Co., Inc., Sanford, ME 04073 1-800-992-2537
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
Cabtron Systems, Inc., Northbrook, IL 60062 312-498-6090
Cardinal Prods., Inc., Santa Ana, CA 92704 714-546-1224
† Churchill Corp., Melrose, MA 02176 617-665-4700
† Craig Systems Corp., Hanson Industries, Amesbury, MA 01913-4848 508-388-5662
† Dahlstrom of Canada Ltd., Toronto, Ontario, CANADA M4G 3E 416-421-5900
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
† Electronic Enclosures, Div. Wyle Labs, El Segundo, CA 90245 213-643-8181
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
† Enclosure Corp., Bristol, PA 19007 215-785-2900
Everest Electronic Equipment, Inc., Anaheim, CA 92806 714-634-2200
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
† Gordon, L., Packaging, Baltimore, MD 21230 301-539-6537
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
† House of Metal Enclosures, Hermann, MO 65041 314-486-3111
† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Langley:Fleet Aerospace, Inc., San Diego, CA 92112 619-264-3181
† Lectro Magnetics, Inc., Los Angeles, CA 90016 ..... 213-870-9383;(USA):800-325-9814; (CA):800-325-9815
† Lindgren RF Enclosures, Inc., Glendale Hgts., IL 60139 312-307-7200
Mantex Corp., Oxford, MI 48051 313-628-8200
Matrix Corp., Raleigh, NC 27610 919-833-2000
† Miller, W. A., Co., Oquossoc, ME 04964-0337 ..... 207-864-3344;800-227-1415
† MuShield Products, Div. Bomco Inc., Gloucester, MA 01930 508-283-9000
† Orcus, Kansas City, MO 64112 913-897-5128
§ Pomona Electronics, Pomona, CA 91766 714-623-3463
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Prototek, Inc., Hamilton, OH 45015 513-874-5094
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Raytheon Semiconductor, Mountain View, CA 94043 415-968-9211
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§ Schroff UK Ltd., Hemel Hempstead, Herts, ENGLAND HP2 4SG 0442-40471/6
§† Simco Co., Hatfield, PA 19440 215-822-2171
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
† STRONGBOX, Culver City, CA 90231-2726 213-305-8288
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§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
† Trilobyte Computer Corporation, San Leandro, CA 94577 415-895-1100
Triplett Corporation, Bluffton, OH 45817-9987 419-358-5015
§ Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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† Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1095-1097
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§† ADE, Inc., Chicago, IL 60633 312-646-3400
§† American Aluminum, Mountainside, NJ 07092 201-233-3500
† Anvil Cases, Inc., Rosemead, CA 91770 ..... 818-575-8614;800-242-4466; 800-423-4279(outside CA)
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
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† Craig Systems Corp., Hanson Industries, Amesbury, MA 01913-4848 508-388-5662
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§† E-Tronics, Sepulveda, CA 91343 818-892-7279
General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
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§† Hardigg Inds., Inc., South Deerfield, MA 01373 413-665-2163
† Instrument Enclosures, Sun Valley, CA 91352 818-768-4622
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
† Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
McCoy Electronics Co., A Sub. of Oak Industries, Mt. Holly Springs, PA 17065 717-486-3411
† Mercury Plastics, A Unit of Zero Corp., Chicopee, MA 01020 413-267-5561
MRL, Missouri Research Labs., St. Charles, MO 63301 .. 314-946-6900;1-800-325-0223
Parsons Manufacturing, Menlo Park, CA 94025-1476 415-324-4726
Plastic Forming, Woodridge, CT 06525 203-397-1338
Precision Tech. Sewing, Palo Alto, CA 94303 415-856-2128
† Princeton Case Co., Inc., Union, NJ 07083 201-687-1750
Pylon Elex Development Co. Ltd., Lachine, PQ, CANADA H8S 1Z3 514-637-1186
Raytheon Semiconductor, Mountain View, CA 94043 415-968-9211
§ Simco Co., Hatfield, PA 19440 215-822-2171
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
Suckle Corp., Scranton, PA 18505 717-346-3871
§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
United Foam Plastics, Georgetown, MA 01833 508-352-2200
Unitrack Industries, Inc., West Chester, PA 19380 215-692-0800
§ Viking Cases, St. Petersburg, FL 33716 813-577-1216
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† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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† Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386

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† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§ W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
§ Tetra-Etch, W. L. Gore & Associates, Inc., Flagstaff, AZ 86002 602-526-1290

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§† **Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ..... C•1726**
§ **Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125**
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§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Chemical Corporation, Pittsburg, CA 94565 415-685-1450
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630

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§ Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
§† EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
§ Eraser Co., Syracuse, NY 13221 315-454-3237
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
§ Micro Electronic Systems, Inc., Brookfield, CT 06804 ..... 203-775-1440;800-243-7254
§† Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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§ **Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580**
† Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
BMW, Inc./Atlas Tack Corp., Lynn, MA 01903 617-593-0200
† Braxton Mfg., Watertown, CT 06795 203-274-6781
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Manufacturing, Glendale, CA 91201 818-243-2069
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
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Micro Plastics Inc., Flippin, AR 72634 501-453-2261
§ Pace Inc., Laurel, MD 20707 301-490-9860
† Stimpson Company, Inc., Bayport, NY 11705-1097 516-472-2000
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
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† **Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749**
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§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
§ Simco Co., Hatfield, PA 19440 215-822-2171
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
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Triac Electronic Systems, Inc., Glendale, NY 11385 718-441-4759
§ TWP, Inc., Berkeley, CA 94710 415-548-4434
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† **General Devices Co., Inc., Indianapolis, IN 46239-9632, 317-897-7000 ... C•1056**
† **Hi-Tech, Inc., Zion, IL 60099, 312-746-2447 ..... C•1659**
§ **Indek Corporation, San Jose, CA 95131, 408-432-1199 ..... C•1664-1668**
§ **Interfan, William J. Purdy Co., Burlingame, CA 94010, 415-347-1203 ..... C•1670-1671**
† **McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550, 609-799-0100 ..... C•1674-1675**
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§ **U.S. Toyo Fan Corp., San Gabriel, CA 91776, 818-287-5297 ..... C•1694-1695**
§ Alpha Dist. Corp., Richfield, OH 44286 216-659-7100
† Amco Engineering, Schiller Pk, IL 60176 ..... 312-671-6670;800-833-3156
† Ashland Elec. Prods., Inc., Rochester, NH 03867 603-335-1100
† Brailsford & Co., Rye, NY 10580 914-967-1820
Buehler Products, Inc., Raleigh, NC 27606 919-469-8522
§† EG & G Rotron, Custom Div., Woodstock, NY 12498 914-679-5201
§ Electric Motor Engineering, Glendale, CA 91201 818-502-1866
† Equipto Electronics Corp., Aurora, IL 60506 312-897-4691
Everest Electronic Equipment, Lawrenceville, GA 30243 404-995-8688
Everest Electronic Equipment, Inc., Anaheim, CA 92806 714-634-2200
§ General Industries, Elyria, OH 44035 216-323-3136
Globe Motors, Dayton, OH 45404 513-228-3171
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
§ Howard Industries, Inc., Milford, IL 60953 815-889-4105
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† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
§ MG Electronics, Hauppauge, NY 11788 516-582-3400
§ Mitsubishi Elctrns. America, Inc., Semiconductor Div., Sunnyvale, CA 94086 408-730-5900
Motor-Tronics, Inc., Vista, CA 92083 619-727-7430
§† NIDEC Corporation, Torrington, CT 06790 203-482-4422
† Optima Enclosures, Tucker, GA 30084-5088 404-496-4000
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
§ Qualtek Electronics Corp., Mentor, OH 44060 216-951-3300
§ Raltron Electronics, Miami, FL 33172 305-593-6033
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
Rittal Corp., Springfield, OH 45504 800-637-4425
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
§ Shinano Kenshi Corp. (SKC), N. Hollywood, CA 91605 818-764-4266
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
§ Super Vexta, Torrance, CA 90503-7395 213-515-2264
§ Worldnet Marketing Inc., Costa Mesa, CA 92626 714-545-7118
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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† **Hi-Tech, Inc., Zion, IL 60099, 312-746-2447 ..... C•1659**
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† Ashland Elec. Prods., Inc., Rochester, NH 03867 603-335-1100
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Indek Corporation, San Jose, CA 95131 408-432-1199
§ Interfan, William J. Purdy Co., Burlingame, CA 94010 415-347-1203
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† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
§ NMB Technologies, Chatsworth, CA 91311 818-341-3355
§ Super Vexta, Torrance, CA 90503-7395 213-515-2264

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§ Comair Rotron, A KLI Company, Saugerties, NY 12477 914-246-3615
† Dynamic Air Engrg., Inc., Santa Ana, CA 92705-5697 714-540-1000
§ General Industries, Elyria, OH 44035 216-323-3136
§ Globe Motors, Dayton, OH 45404 513-228-3171
† IMC Magnetics Corp., Eastern Div., Westbury, NY 11590 516-334-7070
§ Interfan, William J. Purdy Co., Burlingame, CA 94010 415-347-1203
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Japanese Products Corp., Elmsford, NY 10523 914-592-8880

† Kooltronic, Inc., Hopewell, NJ 08525 609-466-3400
† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
§ MG Electronics, Hauppauge, NY 11788 516-582-3400
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ NIDEC Corporation, Torrington, CT 06790 203-482-4422
§ NMB Technologies, Chatsworth, CA 91311 818-341-3355
Optima Enclosures, Tucker, GA 30084-5088 404-496-4000
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
§ Raltron Electronics, Miami, FL 33172 305-593-6033
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
§ Super Vexta, Torrance, CA 90503-7395 213-515-2264

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† Dynamic Air Engrg., Inc., Santa Ana, CA 92705-5697 714-540-1000
Globe Motors, Dayton, OH 45404 513-228-3171
† IMC Magnetics Corp., Eastern Div., Westbury, NY 11590 516-334-7070
§ Interfan, William J. Purdy Co., Burlingame, CA 94010 415-347-1203
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
§ Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
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Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
† Alinabal, Milford, CT 06460 203-877-3241
† Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
§† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
† APM-Hexseal, Englewood, NJ 07631 201-569-5700
§ Arrow Fastener, Saddlebrook, NJ 07662 201-843-6900
† Associated Spring, Barnes Grp., Bristol, CT 06010 203-583-1331
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Cornell Manufacturing, An Elgin Co., Orangeburg, NY 10962 914-365-0400
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§ Dimco-Gray, Dayton, OH 45458 513-433-7600
† Dupree, Inc., Chino, CA 91710 714-597-4889
§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
† Dzus Fastener, W. Islip, NY 11795 516-669-6000
§† Eberhard Mfg. Co., Div., Eastern Co., Strongsville, OH 44136 216-238-9720
EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§† FISHERTECH, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hartwell Corp., Placentia, CA 92670 714-993-4200
† Hoffman Engineering Corp., Stamford, CT 06902 203-325-8933
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Milford Rivet & Mach., Milford, CT 06460 203-878-4631
† Morris, J. I., Co., Southbridge, MA 01550 508-764-4394
§† NKR Precision Manufacturing, Harriman, NY 10926 914-782-8562
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Nylon Molding Corp., Monrovia, CA 91016 818-358-2305
§† Penn Engineering & Manufacturing Corp., Danboro, PA 18916 215-766-8853
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
§† Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
Pulse Tronic Inc., Ville St. Laurnet, Que., CANADA H4L 4Z8 514-747-6028
§† RAF Electronic Hardware, Seymour, CT 06483 203-888-2133
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
† Southco, Inc., Concordville, PA 19331 215-459-4000
§† Standard Insert Co., Penn Engrg. & Mfg. Corp., Horsham, PA 19044 215-956-0350
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Stimpson Company, Inc., Bayport, NY 11705-1097 516-472-2000
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
† Waldes Truarc, Inc., Member of the Seeger Fastening Sys. Grp., Long Island City, NY 11101-4478 718-392-3100
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

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§† All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1148,1150
Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1035
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1850
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
Superior Electric, Bristol, CT 06010, 203-582-9561 ..... C•1532
† Unicorp, Orange, NJ 07050, 201-674-1700 ..... C•1628-1629
Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
Alberox Corporation, New Bedford, MA 02745 508-995-1725
† Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
§† Amrad & Transcon Mfg. Co., Div. of D.J. Assocs., Inc., Fort Smith, AR 72903-7045 501-452-3987
APM-Hexseal, Englewood, NJ 07631 201-569-5700
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Bivar, Inc., Irvine, CA 92718 714-951-8808
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§† Dennison Mfg. Co., Framingham, MA 01701 617-879-0511
Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
† Dzus Fastener, W. Islip, NY 11795 516-669-6000
§† Eberhard Mfg. Co., Div., Eastern Co., Strongsville, OH 44136 216-238-9720
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Globe Plastics, Pomona, CA 91766 714-623-2747
Hanscom, H. F., Co., Inc., Providence, RI 02905 401-941-1455
† Hartwell Corp., Placentia, CA 92670 714-993-4200
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
§ Mallory Capacitor Co., Emhart Elctrl./Elctrn. Grp., Indianapolis, IN 46241 317-856-3731
§ Micro Plastics Inc., Flippin, AR 72634 501-453-2261
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Nylon Molding Corp., Monrovia, CA 91016 818-358-2305
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
§† RAF Electronic Hardware, Seymour, CT 06483 203-888-2133
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
† Southco, Inc., Concordville, PA 19331 215-459-4000
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388

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AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312
Airpax Co., Cambridge Division, Cambridge, MD 21613 301-228-4600
† Alberox Corporation, New Bedford, MA 02745 508-995-1725
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
† APM-Hexseal, Englewood, NJ 07631 201-569-5700
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
Augat Alcoswitch, Augat Inc., N. Andover, MA 01845 508-685-4371
† Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Compac, Holbrook, NY 11741 516-585-3400
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Metuchen Capacitors, Inc., Old Bridge, NJ 08857 201-679-3366
Mini-Systems, Inc., Electronic Package Div., Plainville, MA 02762 508-695-2000
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
PAVE Technology Co., Inc., Dayton, OH 45414-3445 513-890-1100
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Schott Electronics, Seymour, CT 06483 203-881-0102

§ Sloan Technology Corporation, Veeco Instruments Inc., Santa Barbara, CA 93103 805-963-4431
Temescal/Edwards High Vacuum Intl, The BOC Group, Inc., Berkeley, CA 94710 415-841-5720
Vactronic Lab. Equip. Inc., Bohemia, NY 11716 516-567-0520
Veeco Instruments Inc., Plainview, NY 11803 516-349-8300

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Alpha Industries, Inc., Woburn, MA 01801 617-935-5150
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Braxton Mfg., Watertown, CT 06795 203-274-6781
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Fiberoptics Technology, Inc., Pomfret, CT 06258 ..... 203-928-0443, 800-433-5248

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International Resistive Company, Boone, NC 28607, 704-264-8861 .. A•1746-1747
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
Conforming Matrix, Toledo, OH 43611 419-729-3777
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357

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§† Kester Solder Div., Litton Sys., Inc., Des Plaines, IL 60018, 312-297-1600 ..... C•1750
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
Caig Labs., Escondido, CA 92025 619-743-7143
† Contact East, N. Andover, MA 01845 508-682-2000
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
Fusion Inc., Willoughby, OH 44094 216-946-3300
§† Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† Multicore Solders, Westbury, NY 11590 516-334-7997
Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
Tricon Industries, Inc., Brazing Alloys & Chemical Products Div., Downers Grove, IL 60515-4012 312-963-0220

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† Amco Engineering, Schiller Pk., IL 60176, 312-671-6670;800-833-3156 ... C•1008
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§ **Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666** ..... **C•1083**
† **Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200** ..... **C•1084-1085**
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† **Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE** ..... **C•1095,1097**
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Advance, A Unit of Zero Corporation, N. Hollywood, CA 91605 818-983-0333
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
§ Alusett U.S.A., Inc., Pleasantville, NY 10570 914-747-3477
Atlas/Soundolier, Fenton, MO 63026 314-349-3110
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
† Craig Systems Corp., Hanson Industries, Amesbury, MA 01913-4848 508-388-5662
† Electronic Enclosures, Div. Wyle Labs, El Segundo, CA 90245 213-643-8181
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
Hybricon Corporation, Ayer, MA 01432 508-772-5422
Suckle Corp., Scranton, PA 18505 717-346-3871
§† Thermodyne International Ltd., Long Beach, CA 90810 213-603-1976
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660
Zero Corp., Burbank, CA 90503 818-846-4191
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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† **Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151** ..... **C•1697,1733**
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† **McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550, 609-799-0100** ..... **C•1675**
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... **C•1477**
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§† **Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300** ..... **C•1720-1721,1748**
† **Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500** ..... **C•1749**
† Airtron, Litton Industries, Inc., Morris Plains, NJ 07950 201-539-5500
† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Auburn Mfg., Middletown, CT 06457 203-346-6677
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Carey Electronics Engineering Co., Springfield, OH 45505 513-323-6300
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§† CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
† Compac, Holbrook, NY 11741 516-585-3400
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
† Mitec Electronics, Pointe Claire, QUEBEC, CANADA H9R 3X3 514-694-6666
† Omega Precision Corp., Cedar Grove, NJ 07009 201-256-3422
§† Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
§† Press-On Products, Addison, IL 60101 312-628-2255
Soundcoat Co., Inc., Deer Park, NY 11729-5701 516-242-2200
§ Spectrum Control, Inc., Erie, PA 16505 814-455-0966
† Spira Manufacturing Corp., North Hollywood, CA 91605 818-764-8222
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386

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§ Automatic Timing & Controls Co., King of Prussia, PA 19406 ..... 215-337-5500; 800-441-8245
† Bourns Instruments Inc., Riverside, CA 92507 714-781-5148
Computer Instruments Div., Hempstead, NY 11550 516-483-8200
Instron Corp., Canton, MA 02021 617-828-2500
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
† Marlow Industries, Inc., Dallas, TX 75238-1645 214-340-4900
§† NES, Inc. (Nationwide Electronic Systems), Carpentersville, IL 60110 312-426-5900
Robinson-Halpern Products, Transicoil, Inc., Plymouth Meeting, PA 19462-0248 215-825-9200
Schaevitz Engineering, Pennsauken, NJ 08110-1489 609-662-8000
Teledyne Gurley, Troy, NY 12181 518-272-6300
§ Temposonics, MTS Sys. Corp., Plainview, NY 11803 516-349-1950
Trans-Tek, Ellington, CT 06029 203-872-8351
† Warren-Knight Instrument Co., Warren Industries, Inc., Philadelphia, PA 19116 215-464-9300

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§ **Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800** ..... **C•1586**
† **Maxon Precision Motors, Inc., Burlingame, CA 94010, 415-697-9614** ..... **B•1278**
§† **Micro Mo Electronics, Inc., St. Petersburg, FL 33701, 813-822-2529** ..... **B•1280,1282-1283,1966**
† **Motor Technology, Inc., Dayton, OH 45429, 513-294-1041** ..... **B•1284,1286**
SAIA Inc., Elkhart, IN 46515-3030, 219-262-4418 ..... **B•1300-1301**
† **Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk., NY 11040, 516-328-0200;328-3300** ..... **B•1305**
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
† Bowmar Instrument Corp., Aerospace Div., Ft. Wayne, IN 46809 219-747-3121
† EEMCO Div., Datron Systems Inc., Los Angeles, CA 90039 818-247-7060
Escap Products, Hauppauge, NY 11788 516-234-3900
† Evershed & Vignoles, Ltd., Meggitt Holdings P. L. C., Chiswick, London, ENGLAND W4 5HJ 01-994-3670
§† FISHERCAST, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
Graphite Metallizing Corp., Yonkers, NY 10702 914-968-8400
† IMC Magnetics Corp., Eastern Div., Westbury, NY 11590 516-334-7070
† Industrial Control Co., Rockledge, FL 32955 407-259-7105
† Lucas Western Inc., Electro Systems Division, Brea, CA 92621 714-671-4500
§† Machine Components Corp., Plainview, NY 11803 516-694-7222
† Micro-Products Engineering Co., Newark, NJ 07108 201-824-8467
† Perfect Gear & Instrument, Designatronics, Inc., New Hyde Park, NY 11040 516-328-3300
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
Plastimatic, Inc., Glynwed Int'l, Fairfield, NJ 07006 201-575-0038
Polymer Corp., Reading, PA 19605 215-320-6600
Portescap U.S., Inc., Hauppauge, NY 11788 516-234-3900
† Precision Mechanisms, Westbury, NY 11590 ..... 516-ED3-5955
† Precision Specialties, Inc., Northridge, CA 91324 818-349-9774
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
† Transicoil, Inc., Worcester, PA 19490-9990 215-277-1300
† Valley Electromagnetics, Spring Valley, IL 61362 815-664-2348

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Glass Diode Sleeves-2500

Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
Garner Glass Co., Claremont, CA 91711 714-624-5071
GTI/Electronics Div., Hadley, PA 16130 412-253-3161

Glass Parts-2500

† Atlantic Optical Moulding, Webster, MA 01570 617-943-1746
§ Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
§† Ercona, Patchogue, NY 11772 516-758-0700
Garner Glass Co., Claremont, CA 91711 714-624-5071
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
† Kontes, Kimble Div. of Owens/IL, Vineland, NJ 08360 609-692-8500

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† Graphite Metallizing Corp., Yonkers, NY 10702, 914-968-8400 ..... B•1252
† Aremco Products, Inc., Ossining, NY 10562 914-762-0685
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
† Dylon Graphite Co., Berea, OH 44017 216-234-1600
Laser Technology, Inc., N. Hollywood, CA 91604 818-763-7091
Stackpole, Carbon Div., St. Marys, PA 15857 814-781-1234
§† Superior Carbon Products, Inc., Walnut Grove, MS 38189 601-253-2442

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§† ETRI, Inc., Monroe, NC 28110, 704-289-5423 ..... C•1659
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† McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550, 609-799-0100 ..... C•1675
PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 .... C•1067,1072
§† Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1085
Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1109
Amerex, Riverside, CA 92516 714-686-1400
ebm Industries, Inc., Farmington, CT 06032 203-674-1515
§ Fourjay Industries, Dayton, OH 45413-0617 513-890-6444
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
LaFrance Corp., Philadelphia, PA 19153-3893 215-365-8000
§ Martin Sound Prods. Inc., Cleveland, OH 44143-2297 216-442-2286
† Optima Enclosures, Tucker, GA 30084-5088 404-496-4000
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Sparkomatic, Milford, PA 18337 717-296-6444
§ Speco Div., Components Specialties, Inc., Lindenhurst, NY 11757 ..... 516-957-8700; 800-645-5516
Suckle Corp., Scranton, PA 18505 717-346-3871
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§ TWP, Inc., Berkeley, CA 94710 415-548-4434
† Zero Corp., Burbank, CA 90503 818-846-4191

Grommets & Bushings-2500

† AME Corporation, Towaco, NJ 07082-0195, 201-263-1700 ..... B•1678
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060, 609-261-8100;800-541-2500;215-922-6046 ..... C•1618
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
Oshino Electric Lamp Works, Ltd., Shinagawa-Ku, Tokyo, JAPAN, 03-471-8548 ..... B•1176-1177
§ Thermalloy, Inc., Dallas, TX 75381-0339, 214-243-4321 ..... C•1689
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ E-A-R Div., Cabot Corp., Indianapolis, IN 46268 317-872-1111
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
† Gasket International Inc., Bloomfield, NJ 07003 201-338-6814
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Minor Rubber Co., Inc., Bloomfield, NJ 07003 ..... 201-338-6800;800-433-6886
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Nylon Molding Corp., Monrovia, CA 91016 818-358-2305
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300

§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
† Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
† Stimpson Company, Inc., Bayport, NY 11705-1097 516-472-2000
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145

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§† Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... C•1705,1732
§† Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
§ Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
§† Calmark Corp., San Gabriel, CA 91776, 818-287-0451 ..... C•1015
§ Components Corp., Denville, NJ 07834, 201-627-0290 ..... C•1311
§† EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268, 818-442-2572 ..... C•1024-1025
§ Electro Space Fabricators, Topton, PA 19562-0067, 215-682-7181 .. C•1032-1033
Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062
§† Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200 ..... C•1085
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731, 818-579-2300 ... C•1089
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886, 401-732-3770 ..... C•1091
§ Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321 ..... C•1689
Unitrack Industries, Inc., West Chester, PA 19380, 215-692-0800 ... C•1114-1118
Amerex, Riverside, CA 92516 714-686-1400
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Compac, Holbrook, NY 11741 516-585-3400
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Douglas Electronics, San Leandro, CA 94577 415-483-8770
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§† E-Tronics, Sepulveda, CA 91343 818-892-7279
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
Suckle Corp., Scranton, PA 18505 717-346-3871
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
Unibox, Div. of Amerex, Riverside, CA 92516 714-686-1400
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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§ Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
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§† Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313,1617
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† General Devices Co., Inc., Indianapolis, IN 46239-9632, 317-897-7000 ... C•1056
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† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062
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Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666 ..... C•1083
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Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... C•1097
† STRONGBOX, Culver City, CA 90231-2726, 213-305-8288 ..... C•1100-1101
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† Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ..... C•1105-1106,1108
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† Zero Corp., Burbank, CA 90503, 818-846-4191 ..... C•1122
† Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
† Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Calmark Corp., San Gabriel, CA 91776 818-287-0451
Davies, Harry, Molding Co., Chicago, IL 60639 312-622-8966
§† Eberhard Mfg. Co., Div., Eastern Co., Strongsville, OH 44136 216-238-9720
§† Electronic Hardware, Farmingdale, NY 11735 516-752-1950
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
† Hartwell Corp., Placentia, CA 92670 714-993-4200
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
§ Norelcom Inds., Farmingdale, NY 11735 516-249-7245
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
§† RAF Electronic Hardware, Seymour, CT 06483 203-888-2133
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
† Southco, Inc., Concordville, PA 19331 215-459-4000
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
Unitrack Industries, Inc., West Chester, PA 19380 215-692-0800
§† Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§† Vemaline Prods. Div., Warwick, RI 02887 401-739-7600

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§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1274,1277
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§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1467-1468
Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529
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Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Jolo Industries, Inc., Garden Grove, CA 92643 714-554-6840
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
† Mini-Systems, Inc., Electronic Package Div., Plainville, MA 02762 508-695-2000
Morris Enterprises, Sepulveda, CA 91343 818-894-9103
Schott Electronics, Seymour, CT 06483 203-881-0102
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600

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§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1274
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202

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Alberox Corporation, New Bedford, MA 02745 508-995-1725
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
† Electronic Specialty Corp., Vancouver, WA 98665 206-574-5000
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Line Electric Products, Hartford, CT 06141 ..... 203-659-3573;1-800-331-1137
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Moldtronics, Inc., Downers Grove, IL 60515 312-968-7000
§ Morris Enterprises, Sepulveda, CA 91343 818-894-9103
Staffall Inc., Cranston, RI 02910 401-461-5554
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388

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§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297,1299
CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1320
§† 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1467-1468
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§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ AMP, Harrisburg, PA 17105 717-564-0100
Components Corp., Denville, NJ 07834 201-627-0290
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Fujitsu of America, Santa Clara, CA 95054 408-562-1000
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700

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Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1274
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1284-1285
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CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1320,1323
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§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1436
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1457-1458
§ Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1516
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Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... C•1539,1541
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
WECO Electrical Connectors, Inc., Movers, NY 12958, 518-298-4810 ..... C•1564-1565,1568-1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1564-1565,1568-1574
Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
§ Aromat Corp., New Providence, NJ 07974 201-464-3550
† Electronic Specialty Corp., Vancouver, WA 98665 206-574-5000
§ Fujitsu of America, Santa Clara, CA 95054 408-562-1000
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-9847
McKenzie Technology, Fremont, CA 94538 415-651-8700
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
§ Samtec, Inc., New Albany, IN 47150 812-944-6733

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§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297,1299
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
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§ Sullins Electronics Corp., San Marcos, CA 92069, 619-744-0125 ..... C•1530-1531
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§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1564-1565,1568-1569,1571-1572,1574
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
Cinch Connector Division, Labinal Components & Systems Inc, Elk Grove Village, IL 60007 312-981-6000
Concord Electronics Corporation, New York, NY 10012 1-212-777-6671
§ Fujitsu of America, Santa Clara, CA 95054 408-562-1000
§ ICC, Inc., Orange, CA 92665 714-998-8310
§ J.S.T. Corp., Mt. Prospect, IL 60056 312-803-3300
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Wall-Able Mfg. Corp., Elk Grove Vi, IL 60007 312-956-6000

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§ Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 ..... C•1539
† Airpax Co., Cambridge Division, Cambridge, MD 21613 301-228-4600
Alberox Corporation, New Bedford, MA 02745 508-995-1725
† Detronics Corporation, S. El Monte, CA 91733 818-579-7130
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
† Electronic Specialty Corp., Vancouver, WA 98665 206-574-5000
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Motorola Semiconductor Prods. Sector, Phoenix, AZ 85018-6606 602-244-6900

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§ EG & G Wakefield Engineering, Wakefield, MA 01880, 617-245-5900 ..... C•1651
† Electro Impulse, Red Bank, NJ 07701-0870, 201-741-0404 .. C•1652-1653, D•1243
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† McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550, 609-799-0100 ..... C•1675
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Aerotronic, General Signal, Contoocook, NH 03229 603-746-4631
† ATI (Aham Tor Inc.), 999 Company, Temecula, CA 92390-0739 714-676-4151
† Bemco, Pacoima, CA 91331 818-899-5296
† Bird Electronic Corp., Cleveland, OH 44139-2794 216-248-1200
DuPont de Nemours, E. I, & Co., Wilmington, DE 19898 302-773-3218
† EG & G Rotron, Custom Div., Woodstock, NY 12498 914-679-5201
† Electro-Optical Industries, Santa Barbara, CA 93130 ..... 805-964-6701 (ext. 280)
† FTS Systems, Inc., Stone Ridge, NY 12484 914-687-0071
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
† Kooltronic, Inc., Hopewell, NJ 08525 609-466-3400
† Kooltronic, Inc., Ventura, CA 93003 805-642-8521
† Lepel Corp., Edgewood, NY 11717 516-586-3300
† Lytron Incorporated, Woburn, MA 01801 617-933-7300
† Marlow Industries, Inc., Dallas, TX 75238-1645 214-340-4900
† Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
Micronel U.S., Vista, CA 92083 619-727-7400
† Noren Products Inc., Menlo Pk., CA 94025 415-322-9500
Rittal Corp., Springfield, OH 45504 800-637-4425
§ Science/Electronics, Dayton, OH 45401-0986 513-859-5555
Technipower, A Pennil Co., Danbury, CT 06813 203-748-7001
§ Temptronic Corporation, Newton, MA 02158 617-969-2501
† Thermacore Inc., Lancaster, PA 17601 717-569-6551

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§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6650
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Contact East, N. Andover, MA 01845 508-682-2000
§ GTE Corp., Sylvania Emissive Prods./Process Heat, Exeter, NH 03833 603-772-4331
Hanes Products, Phoenix, AZ 85034 602-275-4126
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ Jensen Tools, Inc., Axis, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Master Appliance Corp., Racine, WI 53403 414-637-7791
Micronel U.S., Vista, CA 92083 619-727-7400
§ Newman, M. M., Corp., Hot-Tube Div., Marblehead, MA 01945 617-631-7100
§ Paladin Corp., Newbury Park, CA 91320 805-499-0315
§ Pamran Inc., Racine, WI 53404 414-637-7999
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§† Ramtek Corporation, Fremont, CA 94538 415-490-3999
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Ungar, Div. Eldon Inds., Inc., Buena Park, CA 90620 714-994-2510

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§† Bergquist, Minneapolis, MN 55435, 800-328-3882 ..... C•1686
Crydom Company, Cerritos, CA 90701, 213-865-3536 ..... B•1456,1459
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§ IERC, Burbank, CA 91502, 213-849-2481 ..... C•1661-1663
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§ Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321 ..... C•1689
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§† AAVID Engineering, Inc., Laconia, NH 03247-0400 603-528-3400
Accel Industrial Heat Sink Corp., Los Angeles, CA 90033 213-261-5156
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Astro Dynamics, Inc., Woburn, MA 01801 617-935-4944
† ATI (Aham Tor Inc.), 999 Company, Temecula, CA 92390-0739 714-676-4151
† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§ Distributor & Special Products, Thomson Consumer Electronics, Inc., Deptford, NJ 08096 609-853-2525
Dubbeldee Harris Diamond Corp.:D. Drukker & Zn. N.V., Mt. Arlington, NJ 07856 201-770-1420
Energy Systems, Woodland Hills, CA 91367 818-716-9004
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
§ Hobson Bros., Chicago, IL 60630-3684 312-283-3600
IMC Magnetics Corp., Thermal Products Group, Jericho, NY 11753 516-938-0300
Merrill, Inc., Gwynedd Valley, PA 19437 215-643-2116
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
† M P C, Santa Ana, CA 92704 714-775-0211
† Noren Products Inc., Menlo Pk., CA 94025 415-322-9500
§ Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
§ Powerex, Westinghouse, GE, Mitsubishi, Youngwood, PA 15697 412-925-7272
§ Semikron, Inc., Hudson, NH 03051-0066 ..... 603-883-8102;1-800-258-1308
Staver Co., Inc., Bay Shore, NY 11706 516-666-8000
Tech-Etch, Inc., Plymouth, MA 02360 508-747-0300
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
† Thermacore Inc., Lancaster, PA 17601 717-569-6551
† Tran-Tec Corp., Columbus, NE 68601 402-564-2748

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§† AAVID Engineering, Inc., Laconia, NH 03247-0400, 603-528-3400 ... C•1634-1639

§ **Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321** ..... **C•1689**
† American Etching & Mfg., Pacoima, CA 91331-2796 818-896-1187
Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§ EG & G Wakefield Engineering, Wakefield, MA 01880 617-245-5900
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Staver Co., Inc., Bay Shore, NY 11706 516-666-8000
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Thermacore Inc., Lancaster, PA 17601 717-569-6551
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§† **AAVID Engineering, Inc., Laconia, NH 03247-0400, 603-528-3400** ... **C•1634-1639**
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§ **EG & G Wakefield Engineering, Wakefield, MA 01880, 617-245-5900** ..... **C•1651**
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Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Energy Systems, Woodland Hills, CA 91367 818-716-9004
IERC, Burbank, CA 91502 213-849-2481
† Micro-Etch Products, Inc., Stratford, CT 06497 203-378-8610
† M P C, Santa Ana, CA 92704 714-775-0211
Power Devices Inc., Laguna Hills, CA 92653 714-582-6712
† Products Engrg. Corp., Azusa, CA 91702 818-969-5879
† Thermacore Inc., Lancaster, PA 17601 717-569-6551

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§† Eberhard Mfg. Co., Div., Eastern Co., Strongsville, OH 44136 216-238-9720
† Hartwell Corp., Placentia, CA 92670 714-993-4200
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Stanley Hardware Div., Stanley Works, New Britain, CT 06050 ..... 800-622-HDWE; 203-225-5111

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† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
† Sage Laboratories, Inc., Natick, MA 01760 508-653-0844
† Schott Electronics, Seymour, CT 06483 203-881-0102
Telephonics Corporation/PRD Instruments, Huntington, NY 11743 ..... 516-549-6415/6102

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† American Etching & Mfg., Pacoima, CA 91331-2796 818-896-1187
§† ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
K-Two Industries, Palo Alto, CA 94306 408-720-9316
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500

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† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
§ Wall-Able Mfg. Corp., Elk Grove VI., IL 60007 312-956-8000

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§ Machine Components Corp., Plainview, NY 11803 516-694-7222
† Vernitron Controls, Vernitron Corporation, San Diego, CA 92073 619-428-5581

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† Assemtest, Haverhill, MA 01832 508-373-6800
§ Design Components, Inc., Franklin, MA 02038 ..... 508-528-7300;800-341-4811
International Machine & Tool Corp., Warwick, RI 02888 401-467-6905

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† **Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727** ..... **C•1123**
† Displays, Inc., Lewistown, PA 17044 717-242-2541
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† Ferro Corporation, Electronic Materials Div., Santa Barbara, CA 93117-3092 805-968-5000
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
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† **Bergquist, Minneapolis, MN 55435, 800-328-3882** ..... **C•1696**
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§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
† **Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800** ..... **C•1743**
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§† Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Armstrong World Inds., Lancaster, PA 17604 717-397-0611
† Auburn Mfg., Middletown, CT 06457 203-346-6677
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
ChemRex Inc., ResTech Prods. Div., Commerce City, CO 80022 303-289-5651
§† CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
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Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
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Ferro Corporation, Electronic Materials Div., Santa Barbara, CA 93117-3092 805-968-5000
§ Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
† Furane Products, A Ciba-Geigy Co., Lincoln, RI 02865 401-723-2100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
§† HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
Kam Components, Inc., Nesconset, NY 11767 516-585-0666
Markel Corp., Norristown, PA 19404 215-272-8960
§ Murata Manufacturing Co., Ltd., Nagaoka-Kyo-Shi, Kyoto, JAPAN 617 075-951-9111
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
§ Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
Power Devices Inc., Laguna Hills, CA 92653 714-582-6712
† Rogers Corp., Rogers, CT 06263 203-774-9605
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
† Saphikon, Inc., Milford, NH 03055 603-673-5831
§ S. F. Products Corporation, Southport, CT 06490 203-929-6180
Soundcoat Co., Inc., Deer Park, NY 11729-5701 516-242-2200
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
United Foam Plastics, Georgetown, MA 01833 508-352-2200
§† Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§† Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842
§ Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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§† **Bergquist, Minneapolis, MN 55435, 800-328-3882** ..... **C•1696**
§ **Bivar, Inc., Irvine, CA 92718, 714-951-8808** ..... **C•1011**
† **Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151** ..... **C•1697,1733**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
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§ **Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213** .. **C•1372-1373**
† **Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800** ..... **C•1743**
§† **Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321** ..... **C•1689**
† **Unicorp, Orange, NJ 07050, 201-674-1700** ..... **C•1628-1629**
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† Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† Atlantic Optical Moulding, Webster, MA 01570 617-943-1746
† Auburn Mfg., Middletown, CT 06457 203-346-6677
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
§† Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
§ Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
Garner Glass Co., Claremont, CA 91711 714-624-5071
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§ Markel Corp., Norristown, PA 19404 215-272-8960
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
National Tel-Tronics, Meadville, PA 16335 814-724-6440
Polymer Corp., Reading, PA 19605 215-320-6600
Power Devices Inc., Laguna Hills, CA 92653 714-582-6712
† Quartzite Processing, Inc., Malden, MA 02148 617-322-3611
† Robison Electronics, San Luis Obispo, CA 93403-8121 805-544-8000
† Saphikon, Inc., Milford, NH 03055 603-673-5831
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
† Star Porcelain, Trenton, NJ 08638 609-392-3154
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
† Tran-Tec Corp., Columbus, NE 68601 402-564-2748
United Foam Plastics, Georgetown, MA 01833 508-352-2200
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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§ **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
Accurate Electronics, Elyria, OH 44036 216-366-6330
† Alberox Corporation, New Bedford, MA 02745 508-995-1725

† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† LSI Jennings, San Jose, CA 95122-2696 408-292-4025
§ Markel Corp., Norristown, PA 19404 215-272-8960
§ Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Star Porcelain, Trenton, NJ 08638 609-392-3154
Unadilla Antenna Mfg. Co., Andover, MA 01810 508-475-7831

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§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312
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§† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1453-1455,1457
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Insulators, Heat Sinks-3100

Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Power Devices Inc., Laguna Hills, CA 92653 714-582-6712
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291

Insulators, Mica-3100

† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1743
§ Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321 ..... C•1689
§ AAVID Engineering, Inc., Laconia, NH 03247-0400 603-528-3400
† Apollo Magnetics Corp., Los Angeles, CA 90057 213-381-2500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Power Devices Inc., Laguna Hills, CA 92653 714-582-6712
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
§ Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291

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§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
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§ Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
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§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731, 818-579-2300 ... C•1089
Antona Corp., Los Angeles, CA 90024-5603 213-473-8995
Ark-Les, Watertown, MA 02172 617-924-2330
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§† DataCon, Inc., Burlington, MA 01803 617-273-5800
Douglas Electronics, San Leandro, CA 94577 415-483-8770
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
Gebex Corporation, Irving, TX 75038 214-550-8955
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Rogers Corporation, Circuit Materials Div., Chandler, AZ 85244 602-963-4584
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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§† Advanced Micro Devices, Sunnyvale, CA 94088 408-732-2400
Cherry Semiconductor Corp, East Greenwich, RI 02818 401-885-3600
Exar Corp., San Jose, CA 95161-9007 408-732-7970
† Ferranti Interdesign, Inc., Scotts Valley, CA 95066 408-438-2900
Gebex Corporation, Irving, TX 75038 214-550-8955
§† General Electric Solid State Div., G.E. Corporation, Somerville, NJ 08876 201-685-6530
Gennum Corporation, Linear Technology Inc., Burlington, ON, CANADA L7R 3Y3 ..... 800-263-9353;416-632-2996
Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
HILEVEL Technology, Irvine, CA 92718 714-727-2100
† Holt Inc., Irvine, CA 92718 714-859-8800
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
International Microelectronic Prods., San Jose, CA 95134 408-432-9100
§† LSI Logic Corp., Milpitas, CA 95035 408-433-8000
MCE Semiconductor, Inc., West Palm Beach, FL 33407 407-845-2837
Polycore Electronics, Newbury Pk., CA 91320 805-499-6777
§† Raytheon Semiconductor, Mountain View, CA 94043 415-968-9211
SGS-THOMSON Microelectronics, Phoenix, AZ 85022 602-867-6100
Solitron Devices, Inc., Semiconductor Group, Riviera Beach, FL 33404-9978 407-848-4311
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
§† VLSI Technology, Inc., San Jose, CA 95131 408-434-3100
ZyMOS Corp., Sunnyvale, CA 94086 ..... 408-730-8800;408-730-5400

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§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1450-1451,1881
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Amphenol/Spectra Strip, Hamden, CT 06514 203-281-3200
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
Bit 3 Computer Corporation, Minneapolis, MN 55431-1393 612-881-6955
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Computer Peripherals Inc., Newbury Pk, CA 91320 ..... 805-499-5751;800-854-7600
Creative Micro Systems, Los Alamitos, CA 90720 213-493-2484
Ghielmetti, Inc., Los Angeles, CA 90028-8770 213-463-5111
Hybricon Corporation, Ayer, MA 01432 508-772-5422
L-Com Inc., N. Andover, MA 01845 508-682-6936

† Mac Panel Co., High Point, NC 27264 919-884-8111
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
Opto 22, Huntington Bch, CA 92649 714-891-5861
Rogers Corp. Div. Power Distbn.Div., Mesa, AZ 85205 602-830-3370
Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... C•1477,1623
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ... C•1525,1920
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Alden Products Co., Brockton, MA 02403 508-583-0160
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
L-Com Inc., N. Andover, MA 01845 508-682-6936
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
RDI Elctrns., Inc., New Rochelle, NY 10801 914-632-2828
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Staffall Inc., Cranston, RI 02910 401-461-5554
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000

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Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
§ Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211

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§† **Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840** ..... C•1395
§ **LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366)** ..... C•1401-1402
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§† **Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000** ..... C•1448
§ **Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300** ..... C•1909
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... C•1477,1623
§ **Schurter, Inc., Petaluma, CA 94952, 707-778-6311** ..... C•1523
† **Shogyo International Corp., Great Neck, NY 11021, 516-466-0911** ... C•1525,1920
§† **Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700** ..... C•1534-1537
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Accurate Electronics, Elyria, OH 44036 216-366-6330
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
† Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Anasco Corporation, Danvers, MA 01923 ..... 800-828-2726;508-777-8888
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§† Augat Inc., Attleboro, MA 02703 617-222-2202
Autoswage Products, Shelton, CT 06484 203-929-1401
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
Barber-Colman Co., Indl. Instrs. Div., Rockford, IL 61125-7040 815-877-0241
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
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Components Unlimited, Inc., Portland, OR 97223 503-620-3522
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ EBY Company, Philadelphia, PA 19124 215-537-4700
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
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International Mircoelectronics, Arlington, TX 76003 817-561-2244
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§ Johnson, E. F. Co., Minneapolis, MN 55459-0089 612-942-1000
§† Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Lab-Line Instruments, Melrose Park, IL 60160 312-450-2600
L-Com Inc., N. Andover, MA 01845 508-682-6936
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
† Mac Panel Co., High Point, NC 27264 919-884-8111
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Middleberg Corporation/Middco Connectors, Canton, CT 06019 203-693-8361
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Mouser Electronics, Mansfield, TX 76063 800-346-6873
Mueller Elec. Co., Cleveland, OH 44114 216-771-5225
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§† Raytheon Co., Quincy, MA 02169 617-479-5300
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
Senior Inds., Inc., Wood Dale, IL 60191 312-350-1600
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
§† Superior Electric, Bristol, CT 06010 203-582-9561
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Tricon Industries, Inc., Electromechanical Division, Downers Grove, IL 60515-4076 312-964-2330
§ Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† Virginia Panel, Waynesboro, VA 22980 703-949-8376
Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000

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Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266-1267
§ **EPD Electronics, Inc., Gardena, CA 90247, 213-515-4996** ..... C•1349

Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... **C•1379**
LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... **C•1418-1419,1429,1436, D•1907**
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... **C•1525,1920**
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... **C•1557**
Accurate Electronics, Elyria, OH 44036 216-366-6330
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Concept Industries, App-Rep, Inc., Pico Rivera, CA 90660 ..... 213-699-0918; 800-255-2666
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Dataprobe, Englewood, NJ 07631 201-569-6464
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ International Components Corp., Melville, NY 11747 516-293-1500
International Mircoelectronics, Arlington, TX 76003 817-561-2244
L-Com Inc., N. Andover, MA 01845 508-682-6936
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§† Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Microdot, Interconnect Systems Division, Montgomeryville, PA 18936 ... 215-699-5373
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
RDI Elctrns., Inc., New Rochelle, NY 10801 914-632-2828
Senior Inds., Inc., Wood Dale, IL 60191 312-350-1600
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Wall-Able Mfg. Corp., Elk Grove VL, IL 60007 312-956-8000

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Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... **C•1290**
§† **Janco Corp., Burbank, CA 91504, 818-846-1800** ..... **B•1779**
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Excel Specialty Corp., Chicago, IL 60660 312-262-4781
Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 .. 309-693-3300
† Mini-Systems, Inc., Thick/Thin Film Division, North Attleboro, MA 02761 508-695-0203
Mini-Systems, Inc., Sunbelt Microelectronic Division, Deltona, FL 32725 407-574-0208
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121
State of the Art, Inc., State College, PA 16803-1797 814-355-8004

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AMP, Harrisburg, PA 17105, 717-564-0100 ..... **C•1157**
§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272,1275**
Bradford Electronics, Inc., Bradford, PA 16701, 814-362-5700 ..... **A•1880,1887**
§ **Components Corp., Denville, NJ 07834, 201-627-0290** ..... **C•1311,1616**
§ **Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571** ..... **C•1313,1617**
§ **Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000** ..... **C•1448-1449**
§ **Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225** ..... **C•1456**
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... **C•1477,1623**
Allen Bradley Co., Electronic Components Div., A Rockwell International Co., El Paso, TX 79936 ..... 915-592-4888;800-592-4888
Altron, Inc., Anoka, MN 55303 612-427-7735
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Bussco Inc., El Segundo, CA 90245 213-322-6580
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Cross Electronics, Warrendale, PA 15086 412-776-1591
† DataCon, Inc., Burlington, MA 01803 617-273-5800
Douglas Electronics, San Leandro, CA 94577 415-483-8770
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
EBY Company, Philadelphia, PA 19124 215-537-4700
Eldre Corporation, Rochester, NY 14623 716-427-7280
§† E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
† Fancort Industries, Inc., W. Caldwell, NJ 07006 201-575-0610
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Components Corp., Melville, NY 11747 516-293-1500
§ International Resistive Company, Boone, NC 28607 704-264-8861
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Micro-Ohm Corp., Duarte, CA 91010 818-3575377
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
Noble U.S.A., Inc., Rolling Meadows, IL 60008 312-364-6038
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§† RCD Components, Inc., Manchester, NH 03103 603-669-0054
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Virginia Panel, Waynesboro, VA 22980 703-949-8376

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§ **Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660** ..... **C•1348**
International Manufacturing Services, Portsmouth, RI 02871-2418, 401-683-9700 ..... **A•1953**
§ **3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800** ..... **C•1438**
Vector Electronic Co., Inc., Sylmar, CA 91342, 818-365-9661 ..... **C•1722, 1727-1728**
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Bishop Graphics, Inc., Agoura, CA 91304 818-991-2600
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523 415-932-3911
§ Clarostat Mfg. Co., Inc., Hawker Siddeley, PLC., Dover, NH 03820 603-742-1120,800-872-0042
§ E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
§† EG & G Birtcher, EG & G, Inc., El Monte, CA 91734-1268 818-442-2572
§† E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
† Ferranti Interdesign, Inc., Scotts Valley, CA 95066 408-438-2900
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Gennum Corporation, Linear Technology Inc., Burlington, ON, CANADA L7R 3Y3 ..... 800-263-9353;416-632-2996
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 203-624-3103
§ Heath Co., St. Joseph, MI 49085 616-982-3200
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Holt Inc., Irvine, CA 92718 714-859-8800
§ International Components Corp., Melville, NY 11747 516-293-1500
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800

Pace Inc., Laurel, MD 20707 ... 301-490-9860
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 ... 203-758-8272
§ Pulse Instruments Co., Torrance, CA 90502 ... 213-515-5330
Rehlander Assocs., Beverly, MA 01915 ... 617-922-5961
† Sterling Instruments, New Hyde Pk, NY 11040 ... 516-328-3300
§ Sunshine Scientific Instruments, Philadelphia, PA 19115 ... 215-673-5600
§ Techni-Tool, Plymouth Meeting, PA 19462 ... 215-825-4990
† Techno, A DSG Company, New Hyde Park, NY 11040 ... 516-328-3970
Teledyne Semiconductor, Mountain View, CA 94039-7267 ... 415-968-9241
Vector Electronic Co., Sylmar, CA 91342 ... 818-365-9661
§ Victory Engineering Corp., Springfield, NJ 07081 ... 201-379-5900

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§ AMP, Harrisburg, PA 17105, 717-564-0100 ... C•1157
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523, 415-932-3911 ... D•1006,1008
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1846
† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ... C•1753
Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ... C•1863
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9226 ... C•1384-1385
† Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ... C•1392-1393
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ... C•1438
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ... C•1477,1623
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ... C•1598
Alpha Wire Corp., Elizabeth, NJ 07207-0711 ... 201-925-8000
§ Babcock Display Products, Inc., A Subsidiary of Babcock, Inc., Anaheim, CA 92805 ... 714-491-5121
§ Cinch Connector Division, Labinal Components & Systems inc., Elk Grove Village, IL 60007 ... 312-981-6000
Contact East, N. Andover, MA 01845 ... 508-682-2000
§ Control Cable, Inc., Baltimore MD 21207 ... 301-298-4411
§ E-Z Hook, Teltest Inc., Arcadia, CA 91006 ... 818-446-6175
Hewlett-Packard Co., Cupertino, CA 95014 ... 800-752-0900
International Mircoelectronics, Arlington, TX 76000 ... 817-561-2244
ITT Cannon/Military/Aerospace Div., Santa Ana, CA 92705-5684 ... 714-557-4700
§† Keptel/Armiger, Tinton Falls, NJ 07724 ... 800-526-4687;201-389-8900
L-Com Inc., N. Andover, MA 01845 ... 508-682-6936
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 ... 603-424-4111
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 ... 203-756-8847
† Maury Microwave Corp., Cucamonga, CA 91730 ... 714-987-4715
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 ... 312-392-3500
Mouser Electronics, Mansfield, TX 76063 ... 800-346-6873
Optima Enclosures, Tucker, GA 30084-5099 ... 404-496-4000
§ Paladin Corp., Newbury Park, CA 91320 ... 805-499-0313
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 ... 415-361-3860
† Rowe Industries, Inc., Toledo, OH 43612 ... 419-729-9761
§ Support Systems intl. Corp., Richmond, CA 94804 ... 415-234-0990
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 ... 312-792-2700
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 ... 201-685-1600
† Zippertubing Co., Los Angeles, CA 90061 ... 213-321-3901

Kits, Enclosure Prototyping-1400

Lansing Instruments Corp., Ithaca, NY 14858-0730, 607-272-3265;607-257-7813;800-847-3535 ... C•1068
§ PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-0400 ... C•1066-1067,1070
§ Precision Fabrication Technologies, Inc., Marion, IN 47953, 1-800-558-7297;219-253-6666 ... C•1068
Rittal Corp., Springfield, OH 45504, 800-637-4425 ... C•1086
Stantron, Unit of Zero Corporation, N. Hollywood, CA 91605, 818-841-1225 ... C•1088
† STRONGBOX, Culver City, CA 90231-2726, 213-305-8288 ... C•1100-1101
† Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR ... C•1105-1106,1108
Advance, A Unit of Zero Corporation, N. Hollywood, CA 91605 ... 818-983-0333
Alusett U.S.A., Inc., Pleasantville, NY 10570 ... 914-747-3477
Axis Corporation, San Diego, CA 92111 ... 619-560-7737
§† Bud Industries, Inc., Willoughby, OH 44094-0431 ... 216-946-3200
ELMA Electronic Inc., Fremont, CA 94538 ... 415-656-3400
Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 ... 203-624-3103
Sym-Tek Sys., Inc., San Diego, CA 92123 ... 619-569-6300

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Kits, Marking (Dial, Instrument, Equipment, etc.)-2400

§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ... C•1584,1726
Allen Avionics, Inc., Mineola, NY 11501 ... 516-248-8080
§ Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 ... 414-351-6630
§ Eastern Marking Machines, Hempstead, NY 11550 ... 516-483-7070
ELMA Electronic Inc., Fremont, CA 94538 ... 415-656-3400
§† Kepro Circuit Systems, Fenton, MO 63026 ... 314-343-1630
Metron Optics Inc., Solana Beach, CA 92075-0690 ... 619-755-4477
§ Panduit Corp., Tinley Park, IL 60477-0981 ... 800-777-3300
§ Techni-Tool, Plymouth Meeting, PA 19462 ... 215-825-4990
§ Zippertubing Co., Los Angeles, CA 90061 ... 213-321-3901

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Calex Mfg. Co., Inc., Pleasant Hill, CA 94523, 415-932-3911 ... D•1008
§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ... C•1726
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ... C•1125
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 ... 508-222-2202
§† Automated Prod. Equip. Corp., Medford, NY 11763 ... 516-654-1197
§ Bishop Graphics, Inc., Agoura, CA 91304 ... 818-991-2600
Cybernetic Micro Sys., San Gregorio, CA 94074 ... 415-726-3000
E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 ... 203-624-3103
§ Emco Electronics, Plainview, NY 11803 ... 516-845-7080
Foredom Elec. Co., Blackstone Inds. Inc., Bethel, CT 06801 ... 203-792-8622
§ GC-Thorsen, Rockford, IL 61105-1209 ... 815-968-9661
§† Kepro Circuit Systems, Fenton, MO 63026 ... 314-343-1630
§† Keystone Electronics Corp., Astoria, NY 11105-2017 ... 718-956-8900
Pace Inc., Laurel, MD 20707 ... 301-490-9860
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731 ... 818-579-2300
§ Techni-Tool, Plymouth Meeting, PA 19462 ... 215-825-4990

Kits, Programming Board-4200

DataCon, Inc., Burlington, MA 01803, 617-273-5800 ... C•1725
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ... C•1438
Allied Systems Corp., Greensboro, NC 27419 ... 919-299-2294
† Crosspoint, Div. of Info-Lite, Fairview, NJ 07022 ... 201-941-4455
Douglas Electronics, San Leandro, CA 94577 ... 415-483-8770
† Mac Panel Co., High Point, NC 27264 ... 919-884-8111
Micro Industries, Westerville, OH 43081 ... 614-895-0404

Kits, Shielding-4525

Fair-Rite Prods., Wallkill, NY 12589, 914-895-2055 ... C•1735
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ... C•1743
MuShield Products, Div. Bomco Inc., Gloucester, MA 01930, 508-283-9000 ... C•1746
Schlegel Corp., Rochester, NY 14692, 716-427-7200 ... C•1747
Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ... D•2243
Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ... C•1749
Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-3500 ... C•1750
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 ... 309-633-3800
† Chomerics, Inc./W.R. Grace & Co., Woburn, MA 01888 ... 617-935-4850
† Craig Systems Corp., Herron Industries, Amesbury, MA 01913-4846 ... 508-388-5662
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 ... 317-297-1030
Fenmetics, Fairport, NY 14450 ... 716-388-1020
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 ... 201-241-0710
Instrument Specialties Co., Delaware Water Gap, PA 18327 ... 717-424-8510
† Zippertubing Co., Los Angeles, CA 90061 ... 213-321-3901

Kits, Terminal-2100

§ AMP, Harrisburg, PA 17105, 717-564-0100 ... C•1157
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ... C•1438
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ... C•1477,1623
WECO Electrical Connectors, Inc., Mocers, NY 12958, 518-298-4810 ... C•1568
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-0136 ... C•1568
† Accurate Electronics, Elyria, OH 44036 ... 216-366-6330
Alden Products Co, Brockton, MA 02403 ... 508-583-0160
§ Altech Corp., Somerville, NJ 08876 ... 201-359-4454
Concord Electronics Corporation, New York, NY 10012 ... 1-212-777-6571
† Daniels Manufacturing Corp., Orlando, FL 32809 ... 407-855-6161
§† Keystone Electronics Corp., Astoria, NY 11105-2017 ... 718-956-8900
§ Nichifu America, Inc., Pottstown, PA 19464 ... 215-323-7120
§ Panduit Corp., Tinley Park, IL 60477-0981 ... 800-777-3300
§ Techni-Tool, Plymouth Meeting, PA 19462 ... 215-825-4990
§† Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 ... 203-735-9311
§ Vaco Products, Chicago, IL 60645 ... 312-677-9500

Kits, Training Aid-4200

† Daniels Manufacturing Corp., Orlando, FL 32809 ... 407-855-6161
Diversified Case Co., Whitesboro, NY 13492 ... 800-553-2411;800-258-1168
§ E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 ... 203-624-3103
§ Emco Electronics, Plainview, NY 11803 ... 516-845-7080
† Ferranti Interdesign, Inc., Scotts Valley, CA 95066 ... 408-438-2900
§ Global Specialties, Interplex Electronics, Inc., New Haven, CT 06509 ... 203-624-3103
Hewlett-Packard Co., Cupertino, CA 95014 ... 800-752-0900
§ LJ Technical Systems, Hauppauge, NY 11788 ... 516-234-2100
MCE Semiconductor, Inc., West Palm Beach, FL 33407 ... 407-845-2637
† Microlab/FXR, Livingston, NJ 07039 ... 201-992-7700
§ Midwest Components, Inc., Muskegon, MI 49443 ... 616-777-2602
§ Paccom, Redmond, WA 98052 ... 206-883-8200;800-426-5254
§ Pace Inc., Laurel, MD 20707 ... 301-490-9860
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 ... 203-758-8272
§ Robinson Nugent, Inc., New Albany, IN 47150 ... 812-945-0211
§ Techni-Tool, Plymouth Meeting, PA 19462 ... 215-825-4990
Teledyne Semiconductor, Mountain View, CA 94039-7267 ... 415-968-9241

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§ Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ... C•1013
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ... C•1313,1617
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ... B•1738, C•1585
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ... C•1586
§ Selco Products Co., SEL Sales, Inc., Buena Park, CA 90621, 714-521-8673 ... C•1614
§ Alpha Products, Inc., Westlake Village, CA 91362 ... 818-889-9304
Amerex, Riverside, CA 92516 ... 714-686-1400
§ Augat Alcoswitch, Augat Inc., N. Andover, MA 01845 ... 508-685-4371
Bas Bleu Indl. Co., Ltd., Taipei, TAIWAN 10009 ... (02)331-6519
§† Berg, W. M., Inc., East Rockaway, NY 11518 ... 516-599-5010
§ Bourns, Inc., Resistive Components Group, Riverside, CA 92507 ... 714-781-5050

§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
§ Cosmo Corporation, Cleveland, OH 44109 216-861-5594
§† Davies, Harry, Molding Co., Chicago, IL 60639 312-622-8966
Dimco-Gray, Dayton, OH 45458 513-433-7600
§† Electronic Hardware, Farmingdale, NY 11735 516-752-1950
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
§† FISHERCAST, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
§ Front Panel Devices, Inc., Ronkonkoma, NY 11779 516-737-3322
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Mircoelectronics, Arlington, TX 76003 817-561-2244
ISL Products Int'l, Ltd., Syosset, NY 11791-6093 516-937-3475
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
† Microavionics Corp., Costa Mesa, CA 92626 714-957-6904
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
§ Piher International Corp., Mt. Prospect, IL 60056 ..... 312-390-6680;800-323-6693
Plasticorp, Harbor City, CA 90710 213-539-9530
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§† Radial Controls, Indianapolis, IN 46220 317-255-2796
§ Raytheon Co., Quincy, MA 02169 617-479-5300
§† Rogan, Northbrook, IL 60062 ..... 312-498-2300;800-423-1543
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§† Vernaline Prods. Div., Warwick, RI 02887 401-739-7600

Knobs, Collet-2400

Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... B•1738, C•1585
§ Selco Products Co., SEL Sales, Inc., Buena Park, CA 90621, 714-521-8673 ..... C•1614
Bas Bleu Indl. Co., Ltd., Taipei, TAIWAN 10008 ..... (02)331-6519
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722

Knobs, Limit Stop-2400

Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... C•1585
§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Amerex, Riverside, CA 92516 714-686-1400
Augat Alcoswitch, Augat Inc., N. Andover, MA 01845 508-685-4371
Bas Bleu Indl. Co., Ltd., Taipei, TAIWAN 10008 ..... (02)331-6519
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Front Panel Devices, Inc., Ronkonkoma, NY 11779 516-737-3322
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
† Microavionics Corp., Costa Mesa, CA 92626 714-957-6904
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Raytheon Co., Quincy, MA 02169 617-479-5300
§† Rogan, Northbrook, IL 60062 ..... 312-498-2300;800-423-1543

Knobs, Locking, Control Shaft-2400

Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... C•1585
§ ETI Systems, Polaris Indl. Entprs., Oceanside, CA 92054, 619-757-7770 ..... A•2109
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Bas Bleu Indl. Co., Ltd., Taipei, TAIWAN 10008 ..... (02)331-6519
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Cosmo Corporation, Cleveland, OH 44109 216-861-5594
† Dupree, Inc., Chino, CA 91710 714-597-4889
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
Front Panel Devices, Inc., Ronkonkoma, NY 11779 516-737-3322
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
† Kilo International, La Verne, CA 91750 714-593-4626
† Microavionics Corp., Costa Mesa, CA 92626 714-957-6904
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§† Raytheon Co., Quincy, MA 02169 617-479-5300

Knobs, Slip Clutch-2400

Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Bas Bleu Indl. Co., Ltd., Taipei, TAIWAN 10008 ..... (02)331-6519
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Illinois Lock Co., The Eastern Co., Wheeling, IL 60090 312-537-1800
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
§† Machine Components Corp., Plainview, NY 11803 516-694-7222
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722

Knobs, Torque, Incremental, Ratio Drive-2400

Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Selco Products Co., SEL Sales, Inc., Buena Park, CA 90621, 714-521-8673 ..... C•1614
§ Augat Alcoswitch, Augat Inc., N. Andover, MA 01845 508-685-4371
Bas Bleu Indl. Co., Ltd., Taipei, TAIWAN 10008 ..... (02)331-6519
§ Cosmo Corporation, Cleveland, OH 44109 216-861-5594
K.I. Industries Inc., Elmhurst, IL 60126 312-449-1990
§ Machine Components Corp., Plainview, NY 11803 516-694-7222
† Microavionics Corp., Costa Mesa, CA 92626 714-957-6904
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Raytheon Co., Quincy, MA 02169 617-479-5300
§† Rogan, Northbrook, IL 60062 ..... 312-498-2300;800-423-1543

Labels, Coatings, Crayons, Pellets, etc., Temperature Indicating-5300 — *See Vol. B*

Labels, Pressure Sensitive, Adhesive-2400

§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ..... C•1584,1726
PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... C•1069
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1908
† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
§ Bishop Graphics, Inc., Agoura, CA 91304 818-991-2600
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
§ Computerware, Inc., Vienna, VA 22180 703-821-8200
Display Devices, Inc., Encinitas, CA 92024 619-753-0113
† DOW SWITCH, Wilmington, MA 01887 617-935-6395
§ EPC Identification Sys., Rohnert Park, CA 94928 707-585-8811
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† GM Nameplate, Inc., Seattle, WA 98119 206-284-2200
Gordon, L., Packaging, Baltimore, MD 21230 301-539-6537
† Hallmark Nameplate, Inc., Farmingdale, NY 11735 800-645-9502
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
† Intaq Electrotouch Sys., GM Nameplate, Inc., Seattle, WA 98119 206-284-5475
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
Jayco Plastics of California, Inc., Orange, CA 92665 714-974-1701
† JRW Industries, Inc., Harrisburg, PA 17110 717-236-1418
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mantex Corp., Oxford, MI 48051 313-628-8200
† Markem Corp., Keene, NH 03431 603-352-1130
† Membronics Division, Chicago Decal Company, Chicago, IL 60618 312-463-4007
§† Miller Dial Corp., El Monte, CA 91731 818-444-4555
Oliver Advanced Engineering, Glendale, CA 91203 818-240-0080
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
† Skyway Magnetics, Warner Springs, CA 92086 619-782-3342
Stanpat Prods., Port Washington, NY 11050 516-883-8400
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
Won Tronics, Apollo Magnetics Corp., Los Angeles, CA 90057 213-381-2500
§† Zebra Technologies Corporation, Northbrook, IL 60062 312-564-1800

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Lacing, Cable — See Cords & Tapes, Lacing (Vol. C)

Laminates, Clad Metal, Continuous Strip-2500

Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... C•1704
† Alinabal, Milford, CT 06460 203-877-3241
§ Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
Rogers Corporation, Circuit Materials Div., Chandler, AZ 85244 602-963-4584
Rogers Corp., Rogers, CT 06263 203-774-9605
Technical Materials, Inc., Sub. of Brush Wellman, Inc., Lincoln, RI 02865 401-333-1700

Laminates, Metal Clad (Including Copper)-2500

§ Injectorail Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
† Alinabal, Milford, CT 06460 203-877-3241
§† Astro-Valcour Inc., Buhrmann-Tetterode, Hawthorne, NJ 07507 201-423-3000
Bergquist, Minneapolis, MN 55435 800-328-3882
§ Bishop Graphics, Inc., Agoura, CA 91304 818-991-2600
§ Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
DuPont de Nemours, E. I, & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
† Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† General Elec. Co., Electromaterials Dept., Coshocton, OH 43812 614-622-5310
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
§ Instant Board Circuits Grp., Novato, CA 94949 415-883-1717
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Miller Dial Corp., El Monte, CA 91731 818-444-4555
§† Norplex/Oak Inc., Allied-Signal Inc., La Crosse, WI 54602-1448 608-784-6070
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
† PolyPly Inc., Amsterdam, NY 12010 518-843-3900
Rogers Corporation, Circuit Materials Div., Chandler, AZ 85244 602-963-4584
† Rogers Corporation, Microwave Materials Div., Chandler, AZ 85244 602-961-1382
† Rogers Corp., Rogers, CT 06263 203-774-9605
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
Technical Materials, Inc., Sub. of Brush Wellman, Inc., Lincoln, RI 02865 401-333-1700

Laminates, Plastic Impregnated (Unclad)-2500

American Cyanamid Co., Metal Coated Fibers Dept., Wayne, NJ 07470 .. 201-831-2856
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683

† General Elec. Co., Electromaterials Dept., Coshocton, OH 43812 614-622-5310
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Norplex/Oak Inc., Allied-Signal Inc., La Crosse, WI 54602-1448 608-784-6070
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
† Rogers Corporation, Microwave Materials Div., Chandler, AZ 85244 602-961-1382
Rogers Corp., Rogers, CT 06263 203-774-9605
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241

Laminates, Plastic (With Integral Heating Elements)-5300 — *See Vol. B*

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Lamp Assembly Color Filters, Lens Mountable-2460 — *See Vol. B*

Lamp Drivers-2460 — *See Vol. B*

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Lamps, Deuterium-2460 — *See Vol. B*

Lamps, Edge Lighting, Panel-2460 — *See Vol. B*

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Lamps, Exciter, Photographic-2460 — *See Vol. B*

Lamps, Flashtube-2460 — *See Vol. B*

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Lamps, Incandescent-2460 — *See Vol. B*

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Lamps, Krypton-2460 — *See Vol. B*

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Lamps, Mercury Vapor-2460 — *See Vol. B*

Lamps, Nanotube-2460 — *See Vol. B*

Lamps, Neon-2460 — *See Vol. B*

Lamps, Oil Tight-2460 — *See Vol. B*

Lamps, Press-to-Test-2460 — *See Vol. B*

Lamps, Projection-2460 — *See Vol. B*

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Lamps, Ultraviolet-2460 — *See Vol. B*

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Latches, Panels & Cabinets-2400

Skydyne Div. of AAR, Brooks & Perkins, Port Jervis, NY 12771, 914-856-6655;800-428-CASE ..... **C•1097**
Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
† Dzus Fastener, W. Islip, NY 11795 516-669-6000
§† Eberhard Mfg. Co., Div., Eastern Co., Strongsville, OH 44136 216-238-9720
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
NEC Electronics, Inc., Mountain View, CA 94039 415-960-6000

LCDs — See Diodes, Liquid Crystal (Vol. B)

Lead Assemblies, High Voltage-Also See Connectors; Cable Assemblies & Harnesses-6000

Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... **C•1266**
† Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... C•1302-1303
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379, 508-580-0111 ... C•1309
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ..... C•1392-1393
§ Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1456
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1468
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... C•1517
Supertek Electronics, Inc., Arlington Heights, IL 60005, 312-981-5655 ..... D•2063-2065
† Accurate Electronics, Elyria, OH 44036 216-366-6330
Alberox Corporation, New Bedford, MA 02745 508-995-1725
† Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
AMP, Harrisburg, PA 17105 717-564-0100
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Cardinal Control Co., Kensington, CT 06037 203-828-6379
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§† Electronic Coil Corp., Farmington, CT 06032 203-677-6731
† Engine Systems Division, Simmonds Precision, Norwich, NY 13815 607-335-5000
§† Excel Specialty Corp., Chicago, IL 60660 312-262-4781
E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§† FISHERTECH, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
Hipotronics Inc., Brewster, NY 10509 914-279-8091
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Tevelec, Ltd., Mississauga, Ontario, CANADA L4W 2W6 416-624-5241
Trionics, Inc., St. Charles, IL 60174 312-232-9117

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Limit Stops, Mechanical-2500

§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Dillon, W. C., Weigh-Tronix, inc., Fairmont, MN 56031 507-238-4461
§ Jan Hardware Mfg. Co., Long Island City, NY 11101 718-361-0800
† Perfect Gear & Instrument, Designatronics, Inc., New Hyde Park, NY 11040 516-328-3300
† PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Precision Mechanisms, Westbury, NY 11590 ..... 516-ED3-5955
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
§ Tapeswitch Corp. of America, Farmingdale, NY 11735 516-694-6312
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970

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Locators, Open Short-2900 – *See Vol. D*

Locks, Dial & Shaft-2400

§ **Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586**
Shallco, Inc., Smithfield, NC 27577, 919-934-3135 ..... B•1836-1840
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† Aimsco Inc., Cheler Corp., Seattle, WA 98199-0056 ..... 206-284-5563;800-426-0244
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Heath Co., St. Joseph, MI 49085 616-982-3200
§ Illinois Lock Co., The Eastern Co., Wheeling, IL 60090 312-537-1800
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Vemaline Prods. Div., Warwick, RI 02887 401-739-7600

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Lubricants-1600

† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Caig Labs., Escondido, CA 92025 619-743-7143
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
The Cool-Amp Conducto-Lube Co., Portland, OR 97219 503-244-2230
§† CVC Products, Inc., Rochester, NY 14603 716-458-2550
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
† DuPont de Nemours, E. I, & Co., Wilmington, DE 19898 302-773-3218
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
LNP Engineering Plastics, Div. of ICI Americas, Malvern, PA 19355 215-644-5200
Metron Optics Inc., Solana Beach, CA 92075-0690 619-755-4477
† Miller-Stephenson Chem. Co., Inc., Danbury, CT 06810-0950 203-743-4447
Monsanto Co., St. Louis, MO 63167 314-694-1000
† William F. Nye, Inc., New Bedford, MA 02742-0927 508-996-6721
§ Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500

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§ Alpha Metals, Jersey City, NJ 07305 201-434-6778
† Contact East, N. Andover, MA 01845 508-682-2000
Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
§ Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
§ Glenmarc Manufacturing Inc., Vernon Hills, IL 60061 312-634-6080
§† HumiSeal Div., CHASE Corporation, Woodside, NY 11377 718-932-0800
Lancer Chemical, Warren, RI 02885 401-245-5493
§ PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

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§† E-A-R Div., Cabot Corp., Indianapolis, IN 46268 317-872-1111
Soundcoat Co., Inc., Deer Park, NY 11729-5701 516-242-2200

United Foam Plastics, Georgetown, MA 01833 508-352-2200

Materials, Thick Film-1600
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Electro-Science Labs., Inc., King of Prussia, PA 19406-1533 215-272-8000

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WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... C•1563

§ **WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136** ..... C•1563

§ Altech Corp., Somerville, NJ 08876 201-359-4454

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Infodex, Inc., Wolcott, CT 06716, 203-879-4944 ..... B•1010-1011
§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§ PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... C•1066
Tracewell Enclosures, Inc., Columbus, OH 43081, 614-846-6175;800-848-4525 ..... C•1112
Arrem Plastics, Inc., Addison, IL 60101 312-628-2450
† CELCO, Mahwah, NJ 07430 201-327-1123
Cohu, Inc., Elctrns. Div., San Diego, CA 92123 619-277-6700
Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Hoffman Engineering, Anoka, MN 55303 612-421-2240
Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
MRL, Missouri Research Labs., St. Charles, MO 63301 .. 314-946-6900;1-800-325-0223
Recortec, Inc., Sunnyvale, CA 94086 408-737-8441
† Syntronic Instruments, Inc., Addison, IL 60101 312-543-6444
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§† Vicon Industries, Inc., Melville, NY 11747 516-293-2200

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Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk., NY 11040, 516-328-0200;328-3300 ..... B•1305
† Aeroflex Laboratories Inc., ARX, Inc., Plainview, NY 11803 516-694-6700
§† CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
§ E-A-R Div., Cabot Corp., Indianapolis, IN 46268 317-872-1111
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§† Hardigg Inds., Inc., South Deerfield, MA 01373 413-665-2163
§ Projects Unlimited, Dayton, OH 45414 513-890-1918
† Q.V.S., Inc., East Orange, NJ 07017 201-673-3996
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161

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Memtron Technologies, Inc., Frankenmuth, MI 48734, 517-652-2656;800-234-7525 ..... B•1878
PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... C•1069
† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
Control Laser Corp., Orlando, FL 32809 407-438-2500
† Cut Craft, Inc., Ft. Worth, TX 76102 817-332-6151
† Devco Engineering, Fairfield, NJ 07006 ..... 201-CA8-0321
DOW SWITCH, Wilmington, MA 01887 617-935-6395
§ Furnas Elec., Batavia, IL 60510 312-879-6000
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Ghielmetti, Inc., Los Angeles, CA 90028-8770 213-463-5111
† GM Nameplate, Inc., Seattle, WA 98119 206-284-2200
The Hall Company, Urbana, OH 43078 513-652-1376
† Hallmark Nameplate, Inc., Farmingdale, NY 11735 800-645-9502
† Intaq Electrotouch Sys., GM Nameplate, Inc., Seattle, WA 98119 206-284-5475
Jayco Plastics of California, Inc., Orange, CA 92665 714-974-1701
† JRW Industries, Inc., Harrisburg, PA 17110 717-236-1418
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630
LaFrance Corp., Philadelphia, PA 19153-3893 215-365-8000
§ Lucas Duralith Corporation, Millville, NJ 08332 609-825-6900
Markem Corp., Keene, NH 03431 603-352-1130
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
† Membronics Division, Chicago Decal Company, Chicago, IL 60618 312-463-4007
§† Miller Dial Corp., El Monte, CA 91731 818-444-4555
§† Stanpat Prods., Port Washington, NY 11050 516-883-8400
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
† Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
† Won Tronics, Apollo Magnetics Corp., Los Angeles, CA 90057 213-381-2500

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§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ..... C•1049
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
Superior Electric, Bristol, CT 06010, 203-582-9561 ..... C•1532
† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Cornell Manufacturing, An Elgin Co., Orangeburg, NY 10962 914-365-0400
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Morris, J. I., Co., Southbridge, MA 01550 508-764-4394
§† Penn Engineering & Manufacturing Corp., Danboro, PA 18916 215-766-8853

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Ealing Electro-Optics, Holliston, MA 01746 ..... 617-429-8370;1-800-343-4912
† Melles Griot, Inc., Irvine, CA 92714 714-261-5600
Noll, J. A. Co., Monroeville, PA 15146 412-733-1089
SPS Inc. (Muirhead Vactric), Springfield, NJ 07081 201-376-1222

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§ **Schurter, Inc., Petaluma, CA 94952, 707-778-6311** ..... **C•1520-1522**
§† Brooks Power Systems, Bensalem, PA 19020 ..... 215-244-0264;1-800-523-1551
Contact East, N. Andover, MA 01845 508-682-2000
§ Globtek, Inc., N. Bergen, NJ 07047 201-861-0246
International Configurations, Inc., Enfield, CT 06082 203-749-6380

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ELVO:Division of Zumbach Electronics Corporation, Mt. Kisco, NY 10549 914-241-1008
§† Multicore Solders, Westbury, NY 11590 516-334-7997

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† **Gemini, Cannon Falls, MN 55009, 507-263-3957;800-533-3631** ..... **C•1055**
§† **NRD Inc., Subsidiary of Mark IV Inds., Inc., Grand Island, NY 14072, 716-773-7634** ..... **D•2244**
§† ADE, Inc., Chicago, IL 60633 312-646-3400
§† Astro-Valcour Inc., Buhrmann-Tetterode, Hawthorne, NJ 07507 201-423-3000
§† BayStat, Bay Packaging & Converting Co., Inc., Menlo Park, CA 94025 .. 415-364-3205
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§ Clean Room Prods., Ronkonkoma, NY 11779-6528 516-588-7000
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
† Gordon, L., Packaging, Baltimore, MD 21230 301-539-6537
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
§† Simco Co., Hatfield, PA 19440 215-822-2171
† United Foam Plastics, Georgetown, MA 01833 508-352-2200

Packaging Materials, Foam & Plastic-1400

† **Gemini, Cannon Falls, MN 55009, 507-263-3957;800-533-3631** ..... **C•1055**
† **Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368** ..... **D•2242-2243**
§† ADE, Inc., Chicago, IL 60633 312-646-3400
§† Astro-Valcour Inc., Buhrmann-Tetterode, Hawthorne, NJ 07507 201-423-3000
† Barrington Plastics, Mt. Laurel, NJ 08054 609-235-5151
§† BayStat, Bay Packaging & Converting Co., Inc., Menlo Park, CA 94025 .. 415-364-3205
§ E-A-R Div., Cabot Corp., Indianapolis, IN 46268 317-872-1111
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
§† Hardigg Inds., Inc., South Deerfield, MA 01373 413-665-2163
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
† Mercury Plastics, A Unit of Zero Corp., Chicopee, MA 01020 413-267-5561
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
† Press-On Products, Addison, IL 60101 312-628-2255
Robison Electronics, San Luis Obispo, CA 93403-8121 805-544-8000
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
† United Foam Plastics, Georgetown, MA 01833 508-352-2200
§† Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

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§† **Bergquist, Minneapolis, MN 55435, 800-328-3882** ..... **C•1696**
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§† **Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321** ..... **C•1689**
§† Bivar, Inc., Irvine, CA 92718 714-951-8808
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
† Globe Plastics, Pomona, CA 91766 714-623-2747
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Mini-Systems, Inc., Thick/Thin Film Division, North Attleboro, MA 02761 508-695-0203
Mini-Systems, Inc., Sunbelt Microelectronic Division, Deltona, FL 32725 407-574-0208
§ NTE Electronics, Inc., Bloomfield, NJ 07003 201-748-5089
† Robison Electronics, San Luis Obispo, CA 93403-8121 805-544-8000
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291

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§† Casso-Solar, Pomona, NY 10970 914-354-2500

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† **Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727** ..... **C•1123**
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
§ Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
Contact East, N. Andover, MA 01845 508-682-2000
† E/M Corporation, W. Lafayette, IN 47906 317-497-6346
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Master Bond, Hackensack, NJ 07601 201-343-8983
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
§ Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

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† **Micro-Circuits Co., Inc., New Buffalo, MI 49117, 616-469-2727** ..... **C•1123**
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000
Ferro Corporation, Electronic Materials Div., Santa Barbara, CA 93117-3092 805-968-5000
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
§† Kepro Circuit Systems, Fenton, MO 63026 314-343-1630

Mereco Products Div., Metachem Resins Corp., West Warwick, RI 02893 401-828-4550
Metron Optics Inc., Solana Beach, CA 92075-0690 619-755-4477
§ Murata Manufacturing Co., Ltd., Nagaoka-Kyo-Shi, Kyoto, JAPAN 617 ... 075-951-9111
Transene, Rowley, MA 01969 508-948-2501

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Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1267
† Coax Connection, Yorktown Hgts., NY 10598, 914-962-2303;800-431-2103 ..... C•1308
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Accurate Electronics, Elyria, OH 44036 216-366-6330
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
AMP, Harrisburg, PA 17105 717-564-0100
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
§ COMCAB, Wakefield National, Inc., Nashport, OH 43830 614-828-2468
Communication Devices, Inc., Scarborough, Ont., CAN M1H3A4 416-439-6320
Computer System Products, Minneapolis, MN 55447 ..... 612-476-6866;800-422-2537
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
Crosspoint, Div. of Info-Lite, Fairview, NJ 07022 201-941-4455
§ Dataprobe, Englewood, NJ 07631 201-569-6464
§ Electro Standards Lab., Inc., Providence, RI 02940 401-943-1164
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Front Panel Devices, Inc., Ronkonkoma, NY 11779 516-737-3322
§ Furman Sound, Inc., Greenbrae, CA 94904 415-927-1225
§ Glasgal Communications, Inc., Northvale, NJ 07647 201-768-8082
† Grim Corporation, Medford, NJ 08055-0968 609-267-7950
GTE Fiberoptic Products, Williamsport, PA 17701 ... 717-326-6591;1-800-FBR-OPTICS
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
The Hall Company, Urbana, OH 43078 513-652-1376
§† Keptel/Armiger, Tinton Falls, NJ 07724 ..... 800-526-3697;201-389-8800
† Mac Panel Co., High Point, NC 27264 919-884-8111
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
† STRONGBOX, Culver City, CA 90231-2726 213-305-8288
§† Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
§ Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
† Virginia Panel, Waynesboro, VA 22980 703-949-8376
§ Wall-Able Mfg. Corp., Elk Grove Vl., IL 60007 312-956-8000
York Metal Products, Inc., Long Island City, NY 11106 718-932-3660

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Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1706-1707
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680, 714-669-9473 .... C•1714
Augat Inc., Attleboro, MA 02703 617-222-2202
§ DataCon, Inc., Burlington, MA 01803 617-273-5800
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700

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Pin Straighteners, Tube-5400

§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Pins, Cotter, Dowel, Taper, etc.-2500

Autoswage Products, Shelton, CT 06484 203-929-1401
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk., NY 11040 ..... 516-328-0200;328-3300

Pins, Electrically Conductive-2100

Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571, 203-334-4124 ..... C•1615
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1384
§† Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1447
Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578, 312-438-4000 ..... C•1514
Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630, 312-792-2700 ..... C•1533
Accurate Electronics, Elyria, OH 44036 216-366-6330
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
AME Corporation, Towaco, NJ 07082-0195 201-263-1700
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
§ Augat Inc., Attleboro, MA 02703 617-222-2202
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Crosspoint, Div. of Info-Lite, Fairview, NJ 07022 201-941-4455
§† DataCon, Inc., Burlington, MA 01803 617-273-5800
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
ITT Sealectro, Trumbull, CT 06611 203-372-4118
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
Mac Panel Co., High Point, NC 27264 919-884-8111

§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Philips Elmet, Lewiston, ME 04240 207-784-3591
§† Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
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Autosplice, Inc., Woodside, NY 11377 718-429-0500
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† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
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§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† DataCon, Inc., Burlington, MA 01803 617-273-5800
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
† Hartwell Corp., Placentia, CA 92670 714-993-4200
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
§ Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
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† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
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§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
Canadian Thermoplastics Op., Ferro Corp., Ferro Indl. Prods. Ltd. Thermoplas.Div., Oakville, ONT. L6J 2X1 416-845-4277
† Dennis Chemical, St. Louis, MO 63103 314-771-1800
§ Dolph, John C., Co., Monmouth Junction, NJ 08852 201-329-2333
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
§ Epoxylite Corp., Irvine, CA 92713 714-951-3231
§ FENWAL INC., Ashland, MA 01721 508-881-2000
Ferro Corporation, Complas Filled & Reinforced Plastics Div., Evansville, IN 47711 812-423-5218
Ferro Corporation, Horizon Polymers Div., Houston, TX 77022 713-691-1407
Ferro Corporation, Stryker Plastic Colorants & Dispersions Div., Stryker, OH 43557 419-682-3311
† FMC Corporation, Chemical Products Grp., Philadelphia, PA 19103 215-299-6000
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† Hardman Inc., Belleville, NJ 07109 201-751-3000
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† LNP Engineering Plastics, Div. of ICI Americas, Malvern, PA 19355 215-644-5200
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§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
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§† Pennwalt Corp., Philadelphia, PA 19102 215-587-7520
† PolyPly Inc., Amsterdam, NY 12010 518-843-3900
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
† Rogers Corporation, Molding Materials Div., Manchester, CT 06040 203-646-5500
† Shogyo International Corp., Great Neck, NY 11021 516-466-0911
† Sigma Plastronics, Inc., Whitmore Lake, MI 48189 313-231-2871
Tra-Con, Inc., Medford, MA 02155 617-391-5550
§ Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717
† Whittaker Corp., Providence Chemicals Div., E. Providence, RI 02916 401-434-1770

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§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§ Edsyn, Inc., Van Nuys, CA 91406 ..... 818-989-2324;213-873-5115
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Pioneer Components, Brooklyn, NY 11234 718-444-3880
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Vaco Products, Chicago, IL 60645 312-677-9500
† Waldes Truarc, Inc., Member of the Seeger Fastening Sys. Grp., Long Island City, NY 11101-4478 718-392-3100

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§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Barber-Colman Co., Indl. Instrs. Div., Rockford, IL 61125-7040 815-877-0241
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Communication Devices, Inc., Scarborough, Ont., CAN M1H3A4 416-439-6320
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ GIC Thermodynamics, Royal Oak, MI 48073 313-280-1648
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
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§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
† Mac Panel Co., High Point, NC 27264 919-884-8111
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Omega Engineering, Stamford, CT 06907 800-826-6342
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
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† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
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§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Compac, Holbrook, NY 11741 516-585-3400
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
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GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
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International Components Corp., Melville, NY 11747 516-293-1500
International Configurations, Inc., Enfield, CT 06082 203-749-6380
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ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
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§ Jolo Industries, Inc., Garden Grove, CA 92643 714-554-6840
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Mouser Electronics, Mansfield, TX 76063 800-346-6873
National Tel-Tronics, Meadville, PA 16335 814-724-6440
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
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† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
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Samtec, Inc., New Albany, IN 47150 812-944-6733
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Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
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Todd Systems, Inc., Yonkers, NY 10701 914-963-3400
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000

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§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
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§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
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§ Heyco Molded Products, Inc., Kenilworth, NJ 07033 ..... 201-245-0033;800-526-4182
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
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ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
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3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
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§† Superior Electric, Bristol, CT 06010 203-582-9561
§ Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Todd Systems, Inc., Yonkers, NY 10701 914-963-3400
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ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
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§ Schurter, Inc., Petaluma, CA 94952 707-778-6311
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
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§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
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§† Raytheon Co., Quincy, MA 02169 617-479-5300
Spectra Lux Corp., Kirkland, WA 98034 206-747-0560
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CW Industries, Southhampton, PA 18966, 215-355-7080 ..... **C•1323**
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... **C•1848,1853**
DataCon, Inc., Burlington, MA 01803, 617-273-5800 ..... **C•1725**
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ..... **C•1351-1352**
§ Grayhill Inc., La Grange, IL 60525, 708-354-1040 ..... **C•1371**
§† Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... **C•1477**
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... **C•1525,1920**
§† Superior Electric, Bristol, CT 06010, 203-582-9561 ..... **C•1532**
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... **C•1580**
† Accurate Electronics, Elyria, OH 44036 216-366-6330
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
§ EBY Company, Philadelphia, PA 19124 215-537-4700
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Graphite Metallizing Corp., Yonkers, NY 10702 914-968-8400
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§† Raytheon Co., Quincy, MA 02169 617-479-5300
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Staffall Inc., Cranston, RI 02910 401-461-5554

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Autoswage Products, Shelton, CT 06484 203-929-1401
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ ICS Electronics Corp., San Jose, CA 95131 408-432-9009
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722

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The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. C•1619, D•2241
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
§† Multicore Solders, Westbury, NY 11590 516-334-7997
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
Tricon Industries, Inc., Brazing Alloys & Chemical Products Div., Downers Grove, IL 60515-4012 312-963-0220
† Wilkinson, Westlake Village, CA 91359 ..... 818-889-0050;800-822-4653

Preforms, Soldering-4600

† Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
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§ Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
§† Calmark Corp., San Gabriel, CA 91776, 818-287-0451 ..... C•1015
Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1030
§ Electro Space Fabricators, Topton, PA 19562-0067, 215-682-7181 .. C•1032-1033
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731, 818-579-2300 ... C•1089

§ **Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321** ..... **C•1689**
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§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† Contours Inc., Meriden, CT 06450 203-237-8331
† DataCon, Inc., Burlington, MA 01803 617-273-5800
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Jolo Industries, Inc., Garden Grove, CA 92643 714-554-6840
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
Mac Panel Co., High Point, NC 27264 919-884-8111
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Micro-Products Engineering Co., Newark, NJ 07108 201-824-8467
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
§† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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Belting Industries Co., Inc., Kenilworth, NJ 07033 201-272-8591
Plastimatic, Inc., Glynwed Int'l, Fairfield, NJ 07006 201-575-0038
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300

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§ GreenLee Textron Inc.:Subsidiary of Textron Inc., Rockford, IL 61109 ... 815-397-7070
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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Reamers-5400

§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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Refrigerants, Spray-1600

§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
Contact East, N. Andover, MA 01845 508-682-2000
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523

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Caddock Electronics, Inc., Riverside, CA 92507, 714-788-1700 ..... A•1890-1891
KOA Speer Electronics, Bradford, PA 16701, 814-362-5536 ..... A•1970
Micro-Ohm Corp., Duarte, CA 91010, 818-3575377 ..... A•1990
Milwaukee Resistor Corp., Milwaukee, WI 53204, 414-271-9900 ..... A•1994
§† Ohmite Manufacturing Co., Skokie, IL 60076, 312-675-2600 ... A•2015-2016,2019
§ Allen-Bradley Co., Industrial Control Div., Milwaukee, WI 53201 414-382-2000
§ Bivar, Inc., Irvine, CA 92718 714-951-8808
Bourns, Inc., Resistive Components Group, Riverside, CA 92507 714-781-5050
§† Dale Electronics, Inc., Columbus Div., Columbus, NE 68601-3647 402-564-3131
§† Dale Electronics, Inc., Norfolk Div., Norfolk, NE 68701-2242 402-371-0080
International Resistive Company, Boone, NC 28607 704-264-8861
RCL-Shallcross, Manchester, NH 03102 603-627-3831
Resistors, Inc., Chicago, IL 60650 312-652-7555
Vishay Resistive Systems Group, Malvern, PA 19355 215-644-1300

Resistor Networks, Surface Mount-4700 — *See Vol. A*

Resistors, Adjustable-Also See Potentiometers; Rheostats-4700 — *See Vol. A*

Resistors, Ballast (Incl. Tube & Solid State Devices)-4700 — *See Vol. A*

Resistors, Beryllia Core — See Resistors, Integral Heat Dissipator (Vol. A)

Resistors, Bulk Ceramic-4700 — *See Vol. A*

Resistors, Carbon Film-4700 — *See Vol. A*

Resistors, Ceramic Core-4700 — *See Vol. A*

Resistors, Ceramic Metal (Cermet)-4700 — *See Vol. A*

Resistors, Chip (For Microcircuits)-4700 — *See Vol. A*
Resistors, Composition, Carbon-4700 — *See Vol. A*
Resistors, Decade-4700 — *See Vol. A*
Resistors, Deposited Carbon-4700 — *See Vol. A*
Resistors, Disk, Rod & Tube-4700 — *See Vol. A*
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Resistors, Flame Retardant-4700 — *See Vol. A*
Resistors, Flux Sensitive-4700 — *See Vol. A*
Resistors, Foil, Ultraprecision-4700 — *See Vol. A*
Resistors, Four Terminal-4700 — *See Vol. A*
Resistors, Fuse-4300 — *See Vol. B*
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Resistors, Heat Sink Encased — See Resistors, Integral Heat Dissipator (Vol. A)
Resistors, High Frequency-4700 — *See Vol. A*
Resistors, High Megohm (Over 22 Megohms)-4700 — *See Vol. A*
Resistors, High Temperature (Over 125 + C)-4700 — *See Vol. A*
Resistors, High Voltage (1,000 Volts & Over)-4700 — *See Vol. A*
Resistors, Hot Molded-4700 — *See Vol. A*
Resistors, Integral Heat Dissipator-4700 — *See Vol. A*
Resistors, Low Temperature Coefficient-4700 — *See Vol. A*
Resistors, Metal Film-4700 — *See Vol. A*
Resistors, Metal Glazed-4700 — *See Vol. A*
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Resistors, Negative Temperature Coefficient-4700 — *See Vol. A*
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Resistors, Oil Filled-4700 — *See Vol. A*
Resistors, Plug-in-4700 — *See Vol. A*
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Resistors, Pressure Sensitive-4700 — *See Vol. A*
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Resistors, Strip-4700 — *See Vol. A*
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Resistors, Surge-4700 — *See Vol. A*
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Resistors, Wirewound-4700 — *See Vol. A*
Resistors, Zero-Ohm-4700 — *See Vol. A*
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Resonators, Ceramic-2300 — *See Vol. A*
Resonators, Ceramic, Surface Mount-2700 — *See Vol. A*
Resonators, Microwave, Dielectric-3450 — *See Vol. A*
Resonators, SAW-2300 — *See Vol. A*

Retainers, Battery-2500

§† Bogen Communications, Inc., MPD Products, Ramsey, NJ 07446, 201-934-8500 ..... C•1294
Engineered Assemblies Corp., Clifton, NJ 07011, 201-340-0600;1-800-950-9111 ..... D•1491
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... D•1514-1515
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ..... C•1527, D•1527
Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529
Tauber Elctrns. Inc., San Diego, CA 92117, 619-274-7242 ..... D•1532
§† Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
† Alexander Batteries, New Product/OEM Divison, San Diego, CA 92128 619-480-4445
§ Bogen Communications, Inc., Ramsey, NJ 07446 201-934-8500
Electronic Precision Components Corporation, Mt. Vernon, NY 10550 ... 914-664-2333
Energy Concepts Inc., Carlsbad, CA 92009 619-438-2202
Golden Pacific Electronics, Inc, Placentia, CA 92670 714-993-6970
ISL Products Int'l, Ltd., Syosset, NY 11791-6093 516-937-3475
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† NCE:National Custom Enterprises, Inc., Burnsville, MN 55337 612-890-1360
§ PacTec, LaFrance Corp., Philadelphia, PA 19153 215-365-8400
Parker Hannifin Corp., Cleveland, OH 44112-1290 216-531-3000
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Plainview Batteries, Inc., Boca Raton, FL 33487 407-997-7705
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
§ Rose Electronics,Inc. Div. of Energy Products Group, San Jose. CA 95131 408-943-0440
SAFT America, Inc., Portable Battery Division, Valdosta, GA 31601 912-247-2331
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700

Retainers, Relay-4500 — *See Vol. B*

Retainers, Transistor & Diode-2500

Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... B•1354
Siemens Components, Inc., Special Products Div., Iselin, NJ 08830, 201-321-3400 ..... A•1331
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222

Retainers, Tube-2500

§† IERC, Burbank, CA 91502, 213-849-2481 ..... C•1663
§ FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366

Retractors & Carriers — See Cable Retractors (Vol. C)

RFI Measuring Equipment-2900 — *See Vol. D*

RFI Shielding — See Shields, RF (Vol. C)

RFI Testing Services — See Services, Electrical Measurement & Test (Vol. D)

Rheostats-4750 — *See Vol. A*

Rheostats, Motorized-4750 — *See Vol. A*

Ribbons for Printers-2000 — *See Vol. D*

Rings, Retaining-2500

ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Stock Drive Products, Div. of Designatronics, Inc., New Hyde Pk, NY 11040 ..... 516-328-0200;328-3300
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
† Waldes Truarc, Inc., Member of the Seeger Fastening Sys. Grp., Long Island City, NY 11101-4478 718-392-3100

Rings, Slip — See Slip Rings (Vol. B)

Rivets-2500

ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... C•1619
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Deringer Mfg. Co., Mundelein, IL 60060 312-566-4100
§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Jan Hardware Mfg. Co., Long Island City, NY 11101 718-361-0800
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
Milford Rivet & Mach., Milford, CT 06460 203-878-4631
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245

† Southco, Inc., Concordville, PA 19331 215-459-4000
Stimpson Company, Inc., Bayport, NY 11705-1097 516-472-2000
Tricon Industries, Inc., Brazing Alloys & Chemical Products Div., Downers Grove, IL 60515-4012 312-963-0220

Robotic Pick & Place — See Arms & Manipulators, Robotic (Vol. D)

Robotics — See Arms & Manipulators, Robotic (Vol. D), Control Systems, Robotic (Vol. D)

Robots, Machine Vision-4900 — *See Vol. D*

Robots, Pick and Place-4900 — *See Vol. D*

Rods, Ground-2500

§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Union Carbide Corporation, Industrial Chemicals Div., Crystal Products Dept., San Diego, CA 92123 619-279-4500

Rotators — See Antenna Rotators (Vol. D)

Rotors, Motor & Generator — See Motor & Generator Armatures, Rotors, Stators (Vol. B)

Rubber, Conductive-1600

† AME Corporation, Towaco, NJ 07082-0195, 201-263-1700 ..... B•1678
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1345
Jayco Plastics of California, Inc., Orange, CA 92665, 714-974-1701 ..... B•1868
NTK Technical Ceramics, NGK Spark Plugs (USA), Inc., Springfield, NJ 07081, 201-376-6070 ..... A•1711
† Alasco Rubber & Plastics Corp., Belmont, CA 94002 415-595-4100
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
International Instrumentation, Inc., Westlake Vlg., CA 91361 805-495-7673
§ Lucas Duralith Corporation, Millville, NJ 08332 609-825-6900
† Minor Rubber Co., Inc., Bloomfield, NJ 07003 ..... 201-338-6800;800-433-6886
§† Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
† Press-On Products, Addison, IL 60101 312-628-2255
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
§ Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963 800-328-1368
Stetron International, Inc., Buffalo, NY 14203 716-854-3443
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
§ Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

Rubber Guards (For Equipment) — See Bumpers (Vol. C)

Rubber, Silicone-1600

† AME Corporation, Towaco, NJ 07082-0195, 201-263-1700 ..... B•1678
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1345
Jayco Plastics of California, Inc., Orange, CA 92665, 714-974-1701 ..... B•1868
Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ..... C•1392
† Alasco Rubber & Plastics Corp., Belmont, CA 94002 415-595-4100
† APM-Hexseal, Englewood, NJ 07631 201-569-5700
† Bacon Industries, Watertown, MA 02172-2399 617-926-2550
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§† CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
† Conap, Inc., Olean, NY 14760 716-372-9650
Conductive Rubber Technology, Santa Barbara, CA 93103 805-965-6511
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
§† Dow Corning Corp., Midland, MI 48686-0994 517-496-4000
† Formulated Resins Inc., Div. of TACC Intl. Corp., Rockland, RI 02370 617-878-7015
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
† Gasket International Inc., Bloomfield, NJ 07003 201-338-6814
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Hardman Inc., Belleville, NJ 07109 201-751-3000
† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§ Lucas Duralith Corporation, Millville, NJ 08332 609-825-6900
† Minor Rubber Co., Inc., Bloomfield, NJ 07003 ..... 201-338-6800;800-433-6886
Moxness Products, Inc., Versa Technologies, Racine, WI 53405 ..... 414-554-5050; 800-558-5706
† Press-On Products, Addison, IL 60101 312-628-2255
§ Ram Chemicals, Div. Whittaker Corp., Gardena, CA 90248 213-321-0710
Tra-Con, Inc., Medford, MA 02155 617-391-5550

Satellite Antennas — See Antennas, Satellite (Vol. D)

Satellite Earth Stations, Transmit & Receive-1900 — *See Vol. D*

Scale Expanders, Meter — See Multipliers, Meter (Vol. D)

Scalers, Binary, Decade-2325 — *See Vol. D*

Scales, Dial-2400

§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Dillon, W. C., Weigh-Tronix, Inc., Fairmont, MN 56031 507-238-4461
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ Sunshine Scientific Instruments, Philadelphia, PA 19115 215-673-5600
§ Vemaline Prods. Div., Warwick, RI 02887 401-739-7600

Scales, Electronic (Counting/Weighing)-2900 — *See Vol. D*

Scanners, Bar Code — See Readers, Bar Code (Vol. D)

Scanners, Crossbar-1900 — *See Vol. D*

Scanners, Fiber Optic-2475 — *See Vol. B*

Scanners, Flying Spot-1900 — *See Vol. D*

Scanners, Infrared-2900 — *See Vol. D*

Scanners, Instrument, Input/Output-2900 — *See Vol. D*

Scanners, Optical-2900 — *See Vol. D*

Scanners, Reed-2900 — *See Vol. D*

Scissors-5400

§† Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010

Scope Dollies — See Carts & Dollies, Instrument & Equipment (Vol. C)

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Scramblers, Data-2325 — *See Vol. D*

Scramblers/Descramblers, Video-1900 — *See Vol. D*

Scramblers, Speech-1900 — *See Vol. D*

Screens, Printed Circuit-1700

§† Hybridyne, Inc., Tucson, AZ 85745, 602-629-0001 ..... A•1745
† Aremco Products, Inc., Ossining, NY 10562 914-762-0685
Benchmark Technology, City of Industry, CA 91745 818-333-1201
† Displays, Inc., Lewistown, PA 17044 717-242-2541
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
§ NAZ-DAR/K.C., Thrall Enterprises, Chicago, IL 60622 312-943-8338
§ TWP, Inc., Berkeley, CA 94710 415-548-4434

Screwdrivers-5400

Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§ Foredom Elec. Co., Blackstone Inds. inc., Bethel, CT 06801 203-792-8622
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
Kedman Co., Salt Lake City, UT 84125 801-973-9112
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911
§ Pioneer Components, Brooklyn, NY 11234 718-444-3880
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Vaco Products, Chicago, IL 60645 312-677-9500
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

Screws, Lead, Feed & Translatory — See Drives & Drives Mechanisms (Dial) (Vol. C)

Screws, Fastening-2500

All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1150
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ..... C•1049
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
† Unicorp, Orange, NJ 07050, 201-674-1700 ..... C•1628-1629
† Avibank Manufacturing, Inc., Burbank, CA 91503 818-843-4330
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Morris, J. I., Co., Southbridge, MA 01550 508-764-4394
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
Southco, Inc., Concordville, PA 19331 215-459-4000

Scribers-5400

§ Apollo Lasers, Inc., Chatsworth, CA 91311 818-407-3000
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† Coherent General, Inc., Sturbridge, MA 01566 508-347-2681
† Coherent, Inc., Palo Alto, CA 94303 415-493-2111
Contact East, N. Andover, MA 01845 508-682-2000
§ General Hardware Mfg., New York, NY 10013 212-431-6100
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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Sealing Equipment, Metal to Glass/Ceramic-4100 — *See Vol. D*

Seals & Feedthrus, Environmental — See Feedthrus & Seals, Environmental (Vol. C)

Seals, Ceramic To Metal-2500

† Alberox Corporation, New Bedford, MA 02745 508-995-1725
† Ceramaseal, New Lebanon, NY 12125 518-794-7800
Coors Ceramics Co., Golden, CO 80401 303-278-4000
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
† Engine Systems Division, Simmonds Precision, Norwich, NY 13815 607-335-5000
† Gulton Industries, Inc., Servonic Div., Costa Mesa, CA 92627 ..... 714-642-2400; 800-854-4066
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
HiTemp Technologies, Inc., San Jose, CA 95131-1101 408-922-0740
† Leigh Instruments Ltd., C. R. Snelgrove Co., Comps. Div., Don Mills, ON, CANADA M3B 1M2 416-447-8531
† Master Bond, Hackensack, NJ 07601 201-343-8983
§ Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
United Supertek, Inc., San Jose, CA 95131-1101 408-922-0730
Wilbrecht Electronics, St. Paul, MN 55107 612-222-2791

Seals, Glass To Metal-2500

† Airpax Co., Cambridge Division, Cambridge, MD 21613 301-228-4600
§ Applied Engineering Products, New Haven, CT 06525 203-387-5282
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
§† Armstrong World Inds., Lancaster, PA 17604 717-397-0611
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
Ceramaseal, New Lebanon, NY 12125 518-794-7800
† Connector Industries of America Div., Microdot Mfg., Cincinnati, OH 45215 513-733-3680
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
Ferro Corporation, Electronic Materials Div., Santa Barbara, CA 93117-3092 805-968-5000
† Fifth Dimension, Inc., Trenton, NJ 08638 609-393-8350
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
† Leigh Instruments Ltd., C. R. Snelgrove Co., Comps. Div., Don Mills, ON, CANADA M3B 1M2 416-447-8531
† Master Bond, Hackensack, NJ 07601 201-343-8983
† Mini-Systems, Inc., Electronic Package Div., Plainville, MA 02762 508-695-2000
§ Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
PAVE Technology Co., Inc., Dayton, OH 45414-3445 513-890-1100
† Reeves-Hoffman Div., Dynamics Corporation of America, Carlisle, PA 17013 717-243-5929
† Schott Electronics, Seymour, CT 06483 203-881-0102
† Sealtron, Inc., Cincinnati, OH 45215 513-733-8400
Wilbrecht Electronics, St. Paul, MN 55107 612-222-2791

Seals, Hermetic-Also See Services, Hermetic Sealing-2500

† AME Corporation, Towaco, NJ 07082-0195, 201-263-1700 ..... B•1678
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1344-1345
† Reeves-Hoffman Div., Dynamics Corporation of America, Carlisle, PA 17013, 717-243-5929 ..... C•1624-1626
Airpax Co., Cambridge Division, Cambridge, MD 21613 301-228-4600
† Alberox Corporation, New Bedford, MA 02745 508-995-1725
APM-Hexseal, Englewood, NJ 07631 201-569-5700
§ Applied Engineering Products, New Haven, CT 06525 203-387-5282
Ceramaseal, New Lebanon, NY 12125 518-794-7800
† Connector Industries of America Div., Microdot Mfg., Cincinnati, OH 45215 513-733-3680
† Detoronics Corporation, S. El Monte, CA 91733 818-579-7130
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
HiTemp Technologies, Inc., San Jose, CA 95131-1101 408-922-0740
† Leigh Instruments Ltd., C. R. Snelgrove Co., Comps. Div., Don Mills, ON, CANADA M3B 1M2 416-447-8531
† Master Bond, Hackensack, NJ 07601 201-343-8983
† Micro Mode Prods., El Cajon, CA 92020 619-449-3844
Mini-Systems, Inc., Thick/Thin Film Division, North Attleboro, MA 02761 508-695-0203
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§ Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
† Schott Electronics, Seymour, CT 06483 203-881-0102
† Sealtron, Inc., Cincinnati, OH 45215 513-733-8400
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† Cut Craft, Inc., Ft. Worth, TX 76102 817-332-6151
Elastomeric Technologies, Inc., Hatboro, PA 19040 ..... 215-672-0787;215-672-4741
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
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§† Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
† Press-On Products, Addison, IL 60101 312-628-2255
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† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

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† Altron, Inc., Anoka, MN 55303 612-427-7735
§ American Wire & Electronics, Costa Mesa, CA 92626 714-957-6905
Amphenol Interconnect Products, Endicott, NY 13760 607-754-4444
§† ASMD, Inc., San Diego, CA 92121 619-453-8111
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Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Cable Systems, Inc., Everett, MA 02149 617-389-7080
† CAD Engrg. & Assembly Inc., Mentor, OH 44060 216-255-7744
† Cardinal Control Co., Kensington, CT 06037 203-828-6379
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† Amuneal Manufacturing Corp., Philadelphia, PA 19124 215-535-3000
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† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
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§† Krystinel Corp., Paterson, NJ 07509 201-345-8900
† Lectro Magnetics, Inc., Los Angeles, CA 90016 ..... 213-870-9383;(USA):800-325-9814; (CA):800-325-9815
† Lindgren RF Enclosures, Inc., Glendale Hgts., IL 60139 312-307-7200
† LNP Engineering Plastics, Div. of ICI Americas, Malvern, PA 19355 215-644-5200
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† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
Inter-Technical Group Inc., WIMA Div., Elmsford, NY 10523 914-591-8822
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
§ Screen Data Corp., Dover, NJ 07801 ..... 201-887-7713;800-248-1212

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§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
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§† Krystinel Corp., Paterson, NJ 07509 201-345-8900
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† CELCO, Mahwah, NJ 07430 201-327-1123
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
Hamamatsu Photonics K.K., Hamamatsu City, Shizuoka Pref, JAPAN 0534-52-2141
† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
Inter-Technical Group Inc., WIMA Div., Elmsford, NY 10523 914-591-8822
§† Krystinel Corp., Paterson, NJ 07509 201-345-8900
† Lectro Magnetics, Inc., Los Angeles, CA 90016 ..... 213-870-9383;(USA):800-325-9814; (CA):800-325-9815
† Magnetics, Spang & Co., Butler, PA 16003-0391 412-282-8282
Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
† Products Engrg. Corp., Azusa, CA 91702 818-969-5879
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Schlegel Corp., Rochester, NY 14692 716-427-7200
† Schonstedt Instrument Co., Reston, VA 22090 703-471-1050
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
Thorn EMI Electron Tubes Inc., Fairfield, NJ 07006 201-575-5586
§ Tokin America, Inc., San Jose, CA 95134 408-432-8020
§ Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
Won Tronics, Apollo Magnetics Corp., Los Angeles, CA 90057 213-381-2500
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Shields, Photomultiplier-4525

† Ad-Vance Magnetics, Inc., Rochester, IN 46975, 219-223-3158 ..... C•1730
† Amuneal Manufacturing Corp., Philadelphia, PA 19124, 215-535-3000 ... C•1731
§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1744
† MuShield Products, Div. Bomco Inc., Gloucester, MA 01930, 508-283-9000 ..... C•1746
† Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
Inter-Technical Group Inc., WIMA Div., Elmsford, NY 10523 914-591-8822
§ Thorn EMI Electron Tubes Inc., Fairfield, NJ 07006 201-575-5586

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Ad-Vance Magnetics, Inc., Rochester, IN 46975, 219-223-3158 ..... C•1730
Amuneal Manufacturing Corp., Philadelphia, PA 19124, 215-535-3000 ... C•1731
Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... C•1732
Bergquist, Minneapolis, MN 55435, 800-328-3882 ..... C•1696
† Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151 ..... C•1697,1733
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Filtron Co., Inc., Sub. of ARX Inc., Old Bethpage, NY 11804, 516-752-1144 ..... A•1694
Instrument Specialties Co., Delaware Water Gap, PA 18327, 717-424-8510 ..... B•1012-1013, C•1737-1742
† McLean Engineering, Zero Corporation, Princeton Junction, NJ 08550, 609-799-0100 ..... C•1675
Motorola Semiconductor Prods. Sector, Phoenix, AZ 85018-6606, 602-244-6900 ..... A•2193
PacTec, LaFrance Corp., Philadelphia, PA 19153, 215-365-8400 ..... C•1072
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
Schlegel Corp., Rochester, NY 14692, 716-427-7200 ..... C•1747
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242
§† Tech-Etch, Inc., Plymouth, MA 02360, 508-747-0300 ..... C•1748
† Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
ADE, Inc., Chicago, IL 60633 312-646-3400
† Air/Flex Inds. Inc., S. El Monte, CA 91733 818-579-7060
† AME Corporation, Towaco, NJ 07082-0195 201-263-1700
American Cyanamid Co., Metal Coated Fibers Dept., Wayne, NJ 07470 .. 201-831-2856
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Ark Elctrns. Corp., Southampton, PA 18966 215-322-6510
Arrem Plastics, Inc., Addison, IL 60101 312-628-2450
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Compac, Holbrook, NY 11741 516-585-3400
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
† Dontech, Inc., Doylestown, PA 18901 215-348-5010
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
Elastomeric Technologies, Inc., Hatboro, PA 19040 ..... 215-672-0787;215-672-4741
Evaporated Coatings, Inc., Willow Grove, PA 19090 215-659-3080
ICC, Inc., Orange, CA 92665 714-998-8310
§† Krystinel Corp., Paterson, NJ 07509 201-345-8900
† Lectro Magnetics, Inc., Los Angeles, CA 90016 ..... 213-870-9383;(USA):800-325-9814; (CA):800-325-9815
† Lindgren RF Enclosures, Inc., Glendale Hgts., IL 60139 312-307-7200
† Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
† Omega Precision Corp., Cedar Grove, NJ 07009 201-256-3422
† Optical & Conductive Coatings, Meridian Inds., Inc., Pacheco, CA 94553 415-798-6066
† Orcus, Kansas City, MO 64112 913-897-5128
§ Penn Engineering & Manufacturing Corp., Danboro, PA 18916 215-766-8853
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Ray Proof, Shielding Systems Corp., Norwalk, CT 06856-5060 800-243-5704
§ Spectrum Control, Inc., Erie, PA 16505 814-455-0966
† Spira Manufacturing Corp., North Hollywood, CA 91605 818-764-8222
Staver Co., Inc., Bay Shore, NY 11706 516-666-8000
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
§† Tafa, Inc., Concord, NH 03301 603-224-9585
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
† Titchener, E. H., & Co., Binghamton, NY 13902 607-772-1161
§ Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Shields, Transformer-4525

† Ad-Vance Magnetics, Inc., Rochester, IN 46975, 219-223-3158 ..... C•1730
† Amuneal Manufacturing Corp., Philadelphia, PA 19124, 215-535-3000 ... C•1731
Atlee Inc., North Andover, MA 01845, 508-681-1003 ..... C•1732
§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1745
Microtran Co. Inc., Valley Stream, NY 11582, 516-561-6050 ..... A•2355,2359
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
† Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
Framar Metal Products Co., Inc., Kenilworth, NJ 07033 201-241-0710
† Hudson Tool & Die Co., Newark, NJ 07105 201-589-1800
† Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
† MuShield Products, Div. Bomco Inc., Gloucester, MA 01930 508-283-9000
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Staver Co., Inc., Bay Shore, NY 11706 516-666-8000
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400

Shields, Tube-4525

† Ad-Vance Magnetics, Inc., Rochester, IN 46975, 219-223-3158 ..... C•1730
† Amuneal Manufacturing Corp., Philadelphia, PA 19124, 215-535-3000 ... C•1731
§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1745
† MuShield Products, Div. Bomco Inc., Gloucester, MA 01930, 508-283-9000 ..... C•1746
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
ADE, Inc., Chicago, IL 60633 312-646-3400
† Air/Flex Inds. Inc., S. El Monte, CA 91733 818-579-7060
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
Hamamatsu Photonics K.K., Hamamatsu City, Shizuoka Pref, JAPAN 0534-52-2141
§† IERC, Burbank, CA 91502 213-849-2481
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
† Micro-Circuits Co., Inc., New Buffalo, MI 49117 616-469-2727
† Proto Stamping Corp., Redwood City, CA 94063 415-365-0498
Staver Co., Inc., Bay Shore, NY 11706 516-666-8000
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 .... C•1339,1342
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437

§ **Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300** ..... **C•1468**
Ultronix, Inc., Vishay, Grand Junction, CO 81502, 303-242-0810 ..... **A•2061**
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Excel Specialty Corp., Chicago, IL 60660 312-262-4781
§ Grayhill Inc., La Grange, IL 60525 708-354-1040
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§ Kycon Cable & Connector, Inc., San Jose, CA 95125 408-295-1110
§ NRD Inc., Subsidiary of Mark IV Inds., Inc., Grand Island, NY 14072 716-773-7634
Tepro of Florida, Clearwater, FL 33575 813-796-1044
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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† Accumet Engineering, Hudson, MA 01749 508-568-8311
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000

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Cabtron Systems, Inc., Northbrook, IL 60062, 312-498-6090 ..... **C•1014**
† **General Devices Co., Inc., Indianapolis, IN 46239-9632, 317-897-7000** ... **C•1056**
§ **Hammond Manufacturing Co., Buffalo, NY 14225, 716-894-5710** ..... **C•1057**
† **Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000** ..... **C•1062**
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... **C•1076**
§ **Precision Fabrication Technologies, Inc., Monon, IN 47959, 1-800-558-7297;219-253-6666** ..... **C•1083**
§† **Premier Metal Prods. Co., Bronx, NY 10451, 212-993-9200** ..... **C•1085**
† **STRONGBOX, Culver City, CA 90231-2726, 213-305-8288** ..... **C•1100-1101**
TDJ Co., Inc., San Diego, CA 92110, 619-276-5920 ..... **C•1102**
TDK Corporation, Electronic Components & Material, Tokyo, JAPAN 103, (03) 278-5111 ..... **A•1337**
† **Techmar Corp., Los Angeles, CA 90064, 213-478-0046;1-800-TECHMAR** ..... **C•1105,1108**
† **Zero Corp., Burbank, CA 90503, 818-846-4191** ..... **C•1122**
§† Accuride, Santa Fe Springs, CA 90670 213-903-0373
§† Barnes Engineering, Anaheim, CA 92805 714-533-7530
Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
† Grant Hardware Co., A Mobex Company, West Nyack, NY 10994 914-358-4400
Jonathan Manufacturing Corp., Fullerton, CA 92631 714-526-4651
Lambda Electronics, Veeco Instr., Inc., Melville, NY 11747 516-694-4200
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
Sym-Tek Sys., Inc., San Diego, CA 92123 619-569-6800
Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
† Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

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§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272,1276**
Connector Corp., Chicago, IL 60646, 312-539-3108 ..... **C•1314**
§ **Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660** ..... **C•1348**
§ **McKenzie Technology, Fremont, CA 94538, 415-651-2700** ..... **C•1437**
§ **Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000** ..... **C•1448**
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... **C•1881**
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. **C•1463, D•2241**
Panel Components Corp., Santa Rosa, CA 95406, 707-523-0600 ..... **C•1910**
§ **Pomona Electronics, Pomona, CA 91766, 714-623-3463** ..... **C•1477,1623**
§ **Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722** ..... **C•1506**
Preh Electronic Industries, Inc., Lake Zurich, IL 60047-2578, 312-438-4000 ..... **C•1514**
§ **Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600** ..... **C•1551-1553**
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Alden Products Co., Brockton, MA 02403 508-583-0160
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Antona Corp., Los Angeles, CA 90024-5603 213-473-8995
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Bivar, Inc., Irvine, CA 92718 714-951-8808
Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Data I/O Corp., Redmond, WA 98073-9746 206-881-6444
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Configurations, Inc., Enfield, CT 06082 203-749-6380
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Staffali Inc., Cranston, RI 02910 401-461-5554
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661

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§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272,1275,1277**
§ **McKenzie Technology, Fremont, CA 94538, 415-651-2700** ..... **C•1437**
§ **3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800** ..... **C•1440**
§ **Precicontact, Inc., Langhorne, PA 19047, 215-757-1202** ..... **C•1510**
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... **C•1557**
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§† Hollingsead International, Santa Fe Springs, CA 90670 213-921-3438
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000
Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272**
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. **C•1463, D•2241**
Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... **C•1545**
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ PCD, Peabody, MA 01960 508-532-8800
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800

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§ **AMP, Harrisburg, PA 17105, 717-564-0100** ..... **C•1157**
§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272,1276**
§ **McKenzie Technology, Fremont, CA 94538, 415-651-2700** ..... **C•1437**
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... **C•1557**
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600

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§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1276
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1283
Elastomeric Technologies, Inc., Hatboro, PA 19040, 215-672-0787;215-672-4741 ..... C•1344-1345
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065, 805-522-7958 ..... C•1378-1380
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1391
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438,1440
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. C•1463, D•2241
§ Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1511-1512
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... C•1557
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Mhotronics., Inc., Vernon Hills, IL 60061 312-948-5600
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Welcon/Wells, South Bend, IN 46613 219-287-5941
§† Wells Electronics, South Bend, IN 46613 219-287-5941

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† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314
† Jettron Products Inc., E. Hanover, NJ 07936, 201-887-0571 ..... C•1393
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960

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† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ EBY Company, Philadelphia, PA 19124 215-537-4700
EI & S Corporation, Stoneham, MA 02180 617-438-5300
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§ Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960

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§ Visual Communications Co., Inc., San Diego, CA 92126, 619-549-6900 ..... B•1200-1203
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Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
Leecraft Mfg., Long Island City, NY 11101 718-392-8800
LZR Electronics, Inc., Gaithersburg, MD 20879 301-921-9440
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
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§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1274,1276
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CW Industries, Southhampton, PA 18966, 215-355-7080 ..... C•1320
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
§† 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1440
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
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§ Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1510-1513
§ Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... C•1542,1545,1547,1549
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551,1553
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§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Douglas Electronics, San Leandro, CA 94577 415-483-8770
§† Electronics Research Associates Inc., Winsted, CT 06098 203-379-2731
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
ITT Components, ITT Corporation, Irvine, CA 92718 714-727-3001
JAE Electronics Inc., Santa Ana, CA 92705-5504 714-250-8770
§† Jolo Industries, Inc., Garden Grove, CA 92643 714-554-6840
LZR Electronics, Inc., Gaithersburg, MD 20879 301-921-9440
§ Mallory Capacitor Co., Emhart Elctrl./Elctrn. Grp., Indianapolis, IN 46241 317-856-3731
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
† Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Texas Instrs., Inc., Dallas, TX 75380 ..... 800-232-3200 (ext 700)
§† Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
§ Textool Test & Interconnect Prods. Dept, 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Welcon/Wells, South Bend, IN 46613 219-287-5941
§† Wells Electronics, South Bend, IN 46613 219-287-5941
Zero Corp., Burbank, CA 90503 818-846-4191

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§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
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§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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§† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
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§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1273,1276
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§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007, 312-981-6000 ..... C•1305
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Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1318
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067, 214-221-8776 ..... C•1346
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716, 516-563-3388 ..... C•1125
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 ..... C•1391
§† Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1396
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438,1440

§ **Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000** ..... **C•1448**
§ **MOLEX, Inc., Lisle, IL 60532, 312-969-4550** ..... **B•1815, C•1881**
§† **Precontact, Inc., Langhorne, PA 19047, 215-757-1202** ..... **C•1510-1513**
§ **Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450** ..... **C•1544-1545,1547-1549**
§ **Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600** ..... **C•1551-1553**
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... **C•1557**
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
§ Alpha Dist. Corp., Richfield, OH 44286 216-659-7100
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§ Augat Inc., Attleboro, MA 02703 617-222-2202
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Calex Mfg. Co., Inc., Pleasant Hill, CA 94523 415-932-3911
§ Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
Douglas Electronics, San Leandro, CA 94577 415-483-8770
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
LZR Electronics, Inc., Gaithersburg, MD 20879 301-921-9440
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Mhotronics., Inc., Vernon Hills, IL 60061 312-948-5600
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Mouser Electronics, Mansfield, TX 76063 800-346-6873
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ NTE Electronics, Inc., Bloomfield, NJ 07003 201-748-5089
§ PCD, Peabody, MA 01960 508-532-8800
§ Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§† Scanbe, Unit of Zero Corporation, El Monte, CA 91731 818-579-2300
§ SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
Staffali Inc., Cranston, RI 02910 401-461-5554
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
Vector Electronic Co., Sylmar, CA 91342 818-365-9661
§ Wall-Able Mfg. Corp., Elk Grove Vl., IL 60007 312-956-8000
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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LZR Electronics, Inc., Gaithersburg, MD 20879, 301-921-9440 ..... **D•1900-1902,1904-1905,1907**
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Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
International Configurations, Inc., Enfield, CT 06082 203-749-6380
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
Precontact, Inc., Langhorne, PA 19047 215-757-1202
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311

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§ **Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660** ..... **C•1348**
§ **Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110** ..... **C•1398-1399,1867**
§ **3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800** ..... **C•1440**
§ **Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000** ..... **C•1448**
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... **D•2241**
§ **Precontact, Inc., Langhorne, PA 19047, 215-757-1202** ..... **C•1512**
§ **Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600** ..... **C•1551-1553**
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
§ Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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§ **AMP, Harrisburg, PA 17105, 717-564-0100** ..... **C•1157**
§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272-1274, 1276-1277**
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§ **McKenzie Technology, Fremont, CA 94538, 415-651-2700** ..... **C•1437**
§ **3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800** ..... **C•1438,1440**
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Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... **C•1545**
§ **Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600** ..... **C•1551-1553**
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§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Mhotronics., Inc., Vernon Hills, IL 60061 312-948-5600
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§† Wells Electronics, South Bend, IN 46613 219-287-5941

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§ **Aries Electronics, Frenchtown, NJ 08825, 201-996-6841** ..... **C•1272,1275-1276**
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§ **Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660** ..... **C•1348**
§ **McKenzie Technology, Fremont, CA 94538, 415-651-2700** ..... **C•1437**
§ **3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800** ..... **C•1440**
MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... **C•1450-1451**
§ **The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281** ..... **C•1463, D•2241**
§ **Precontact, Inc., Langhorne, PA 19047, 215-757-1202** ..... **C•1510-1512**
§ **Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450** ..... **C•1548**
§ **Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600** ..... **C•1551-1553**
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... **C•1557**
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ Hirose Electric U.S.A., Inc. (HRS), Div. of Hirose Electric Co. Ltd. (Japan), Simi Valley, CA 93065 805-522-7958
JAE Electronics Inc., Santa Ana, CA 92705-5504 714-250-8770
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Mhotronics., Inc., Vernon Hills, IL 60061 312-948-5600
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Welcon/Wells, South Bend, IN 46613 219-287-5941
§ Wells Electronics, South Bend, IN 46613 219-287-5941

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Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... **C•1298**
Corcom, Inc., Libertyville, IL 60048, 312-680-7400 ..... **C•1317**
§ **Globtek, Inc., N. Bergen, NJ 07047, 201-861-0246** ..... **C•1369**
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Multi-Contact USA, Santa Rosa, CA 95401, 707-575-7575 ..... C•1460-1462
Perma Power Elctrns., Chicago, IL 60648, 312-647-9414 ..... C•1620
§ Power Dynamics Inc., West Orange, NJ 07052, 201-736-5722 ..... C•1506, 1508-1509
Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529
§ Thermalloy, Inc., Dallas, TX 75381-0839, 214-243-4321 ..... C•1689
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
§† Brooks Power Systems, Bensalem, PA 19020 ..... 215-244-0264;1-800-523-1551
Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
International Configurations, Inc., Enfield, CT 06082 203-749-6380
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311
§† The Wiremold Company, W. Hartford, CT 06110 203-233-6251

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§ American Zettler, Aliso Viejo, CA 92656, 714-831-5000 ..... B•1431
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314
§ Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1318
§ IDEC Corporation, Sunnyvale, CA 94089-2211, 408-747-0550 ..... B•1540
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§ Potter & Brumfield, A Siemens Co., Princeton, IN 47671-0001, 812-386-1000 ..... B•1597,1601
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... C•1557
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... C•1577
Accurate Electronics, Elyria, OH 44036 216-366-6330
§ Alarm Controls Corporation, Deer Park, NY 11729 516-586-4220
AMP, Harrisburg, PA 17105 717-564-0100
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§ Aromat Corp., New Providence, NJ 07974 201-464-3550
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Augat/RDI, Carol Stream, IL 60188 312-682-4100
Bosch, Robert, Corp., Broadview, IL 60153 312-865-5200
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Cardinal Control Co., Kensington, CT 06037 203-828-6379
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ C.P. Clare Corp., Chicago, IL 60645 312-262-7700
Computer Components, Inc., Pelham, NY 10803 914-738-1611
§ Custom Connector, Cleveland, OH 44114 216-241-1679
† DAN-L Inc., E. Northport, NY 11731 516-757-8000
§ Diversified Electronics, Inc., Evansville, IN 47706-1140 812-426-2806
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Eagle Signal Controls:A Mark IV Inds. Co., Austin, TX 78753 512-837-8300
§ EBY Company, Philadelphia, PA 19124 215-537-4700
§ Electromatic Controls Corp., Hoffman Estates, IL 60195-2010 312-882-5757
§ FEME Electronics, Inc., Plymouth Meeting, PA 19462 215-941-0366
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Inmark Corp., Norwalk, CT 06854 203-866-8474
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ ITT Components, ITT Corporation, Irvine, CA 92718 714-727-3001
§† Leach Relay Division, Leach Corporation, Los Angeles, CA 90003 213-232-8221
§ Line Electric Products, Hartford, CT 06141 ..... 203-659-3573;1-800-331-1137
§ Magnecraft Electric Co., Northbrook, IL 60062-5376 312-564-8800
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§† Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Omron Elctrns., Inc., Control Comps. Div., Schaumburg, IL 60173 312-843-7900
§† PCD, Peabody, MA 01960 508-532-8800
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Schrack North America Corp., Ronkonkoma, NY 11779-7209 516-737-0099
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Souriau, Inc., Valencia, CA 91355 805-257-4830
§ Square D Co., Palatine, IL 60067 312-397-2600
§† Struthers-Dunn Military Relays, Sub. Of Nytronics, Inc., Pitman, NJ 08071-0901 609-589-7500
§† Struthers-Dunn Industrial & Commerical Relays, Sub. of Nytronics, Inc., Darlington, SC 29532 803-393-5421
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
§ Time Mark Corp., Tulsa, OK 74116 918-438-1220
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 818-341-4330
§ Wall-Able Mfg. Corp., Elk Grove VI, IL 60007 312-956-8000

Sockets, SIMM-2100

§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1279
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1440
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... C•1557
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
Mhotronics, Inc., Vernon Hills, IL 60061 312-948-5600
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300 516-922-6000

Sockets, SIP-2100

§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1273, 1276-1277
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703, 508-222-2202 ..... C•1283,1286
§† Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1395-1396
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1440
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1449
§ Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1510-1511,1513
Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... C•1545,1549
§ Thomas & Betts Corporation, Bridgewater, NJ 08807, 201-685-1600 ..... C•1551-1553
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... C•1557
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Alpha Products, Inc., Westlake Village, CA 91362 818-889-9304
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Elfab Corporation, Augat, Inc., Lewisville, TX 75067 214-221-8776
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§† Wells Electronics, South Bend, IN 46613 219-287-5941

Sockets, Surface Mount-2100

AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1318
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
§ Kycon Cable & Connector, Inc., San Jose, CA 95125, 408-295-1110 ..... C•1398-1399,1867
§ McKenzie Technology, Fremont, CA 94538, 415-651-2700 ..... C•1437
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. C•1463, D•2241
§ Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1511-1512
Speciality Electronics, Inc., Landrum, SC 29356, 803-457-3824 ..... C•1529
Teka Interconnection Systems, Providence, RI 02907, 401-785-4110 .... C•1541
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
Aromat Corp., New Providence, NJ 07974 201-464-3550
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
† Azimuth Electronics, Inc., San Clemente, CA 92672 714-492-6481
International Configurations, Inc., Enfield, CT 06082 203-749-6380
LZR Electronics, Inc., Gaithersburg, MD 20879 301-921-9440
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ Power Dynamics Inc., West Orange, NJ 07052 201-736-5722
Samtec, Inc., New Albany, IN 47150 812-944-6733
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Visual Communications Co., Inc., San Diego, CA 92126 619-549-6900

Sockets, Test-2100

§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272,1277
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
ELMA Electronic Inc., Fremont, CA 94538, 415-656-3400 ..... C•1585
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
§ 3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1440
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .. C•1463, D•2241
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
Texas Instruments, Connector System, Attleboro, MA 02703, 508-699-5269;508-699-3450 ..... C•1545
AMP, Harrisburg, PA 17105 717-564-0100
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Augat/Pylon Co., Inc., Attleboro Falls, MA 02763 508-699-9800
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ Richard Hirschmann of America Inc., Riverdale, NJ 07457 201-835-5002
† Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228

§ Interconnect Devices, Inc., Kansas City, KS 66106 913-342-5544
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
Mac Panel Co., High Point, NC 27264 919-884-8111
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
† Oxley, Inc., Branford, CT 06405 203-488-1033
PCD, Peabody, MA 01960 508-532-8800
Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311
Sunrise Electronics, Inc., Glendora, CA 91740 818-914-1926
§ Wells Electronics, South Bend, IN 46613 219-287-5941
§ "World" Test Systems, Inc., Waynesboro, VA 22980 703-949-6753

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§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314
§ Grayhill Inc., La Grange, IL 60525, 708-354-1040 ..... C•1371
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1815, C•1881
† U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... C•1557
AMP, Harrisburg, PA 17105 717-564-0100
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ EBY Company, Philadelphia, PA 19124 215-537-4700
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ NTE Electronics, Inc., Bloomfield, NJ 07003 201-748-5089
§ Philips ECG, American Philips Co., Waltham, MA 02254 617-890-6107
Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Textool Test & Interconnect Prods. Dept., 3M Electronic Products Division, Austin, TEXAS 78769-2963 512-984-1800
§ Wall-Able Mfg. Corp., Elk Grove VI, IL 60007 312-956-8000
§ Wells Electronics, South Bend, IN 46613 219-287-5941

Sockets, Tube-2100

† Connector Corp., Chicago, IL 60646, 312-539-3108 ..... C•1314
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
Alden Products Co., Brockton, MA 02403 508-583-0160
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
§ Augat/RDI, Carol Stream, IL 60188 312-682-4100
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ EBY Company, Philadelphia, PA 19124 215-537-4700
EI & S Corporation, Stoneham, MA 02180 617-438-5300
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† Jettron Products Inc., E. Hanover, NJ 07936 201-887-0571
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
Master Electronic Controls, Los Angeles, CA 90025 213-452-1336
Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Staffall Inc., Cranston, RI 02910 401-461-5554
§ Thorn EMI Electron Tubes Inc., Fairfield, NJ 07006 201-575-5586

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Software, Communications-2050 — *See Vol. D*

Software, Compilers/Languages-2050 — *See Vol. D*

Software, Computer Performance Measurement-2050 — *See Vol. D*

Software, Data Base Management-2050 — *See Vol. D*

Software, Data Base Management Dictionaries-2050 — *See Vol. D*

Software, Data Base Query Language-2050 — *See Vol. D*

Software, Data Communications Control-2050 — *See Vol. D*

Software, DC Motor Control-2050 — *See Vol. D*

Software, Disk/Tape File Utilities-2050 — *See Vol. D*

Software, Emulation/Simulation-2050 — *See Vol. D*

Software, Graphics-2050 — *See Vol. D*

Software, Information Storage & Retrieval-2050 — *See Vol. D*

Software, Job Scheduling/Accounting-2050 — *See Vol. D*

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Software, Operating Systems Enhancement-2050 — *See Vol. D*

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Software, Security-2050 — *See Vol. D*

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Software, Spoolers-2050 — *See Vol. D*

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Solar Cells — See Cells, Photovoltaic (Vol. B)

Solder (All Types)-4600

§† Kester Solder Div., Litton Sys., Inc., Des Plaines, IL 60018, 312-297-1600 ..... C•1750
§† Alpha Metals, Jersey City, NJ 07305 201-434-6778
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
† DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
Edsyn, Inc., Van Nuys, CA 91406 ..... 818-989-2324;213-873-5115
† Electro-Science Labs., Inc., King of Prussia, PA 19406-1533 215-272-8000
† EMCA/ROHM & HAAS, Montgomeryville, PA 18936 215-855-1000
Ferro Corporation, Electronic Materials Div., Santa Barbara, CA 93117-3092 805-968-5000
† Fusion Inc., Willoughby, OH 44094 216-946-3300
§† Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§† Multicore Solders, Westbury, NY 11590 516-334-7997
National Tel-Tronics, Meadville, PA 16335 814-724-6440
† New England Smelting Works, Inc., W. Springfield, MA 01090 413-734-6491
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
Transene, Rowley, MA 01969 508-948-2501
§† WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136

Solder Lugs — See Terminals, Lug (All Types) (Vol. C)

Solder Pots & Baths-4600

Kester Solder Div., Litton Sys., Inc., Des Plaines, IL 60018, 312-297-1600 ..... C•1750
§ Acme Elec. Heating Corp., Hialeah, FL 33013 305-685-8326
Air-Vac Engrg., Milford, CT 06460 203-874-2541
Caig Labs., Escondido, CA 92025 619-743-7143
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
§ Contact, Inc., Hudson, NH 03051 603-883-7708
Contact East, N. Andover, MA 01845 508-682-2000
§ ESICO/TRITON, Triton Industries Inc., Deep River, CT 06417 203-526-5361
§ Hexacon Electric Co., Roselle Park, NJ 07204 201-245-6200
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Multicore Solders, Westbury, NY 11590 516-334-7997
OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§† Plato Products, Inc., Glendora, CA 91740 800-423-4510
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Trent, Inc., Philadelphia, PA 19127 215-482-5000
† Unit Design, Fullerton, CA 92631 714-526-0800

Soldering, Wave, Control/Monitoring-4600

Contact East, N. Andover, MA 01845 508-682-2000
§ Electronic Controls Design, Mulino, OR 97042 503-829-9108
Hexacon Electric Co., Roselle Park, NJ 07204 201-245-6200

Soldering Accessories-4600

Kester Solder Div., Litton Sys., Inc., Des Plaines, IL 60018, 312-297-1600 ..... C•1750
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025, 415-361-3860 ..... C•1515
† Air-Vac Engrg., Milford, CT 06460 203-874-2541
§† Antex Division, Marblehead, MA 01945 617-631-7100
§† ASMD, Inc., San Diego, CA 92121 619-453-8111

§† Automated Prod. Equip. Corp., Medford, NY 11763 516-654-1197
§† Beau Tech, Portland, ME 04101 207-775-6139
§ Caig Labs., Escondido, CA 92025 619-743-7143
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
§ Contact, Inc., Hudson, NH 03051 603-883-7708
† Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§† Edsyn, Inc., Van Nuys, CA 91406 ..... 818-989-2324;213-873-5115
ELVO:Division of Zumbach Electronics Corporation, Mt. Kisco, NY 10549 914-241-1008
§ ESICO/TRITON, Triton Industries Inc., Deep River, CT 06417 203-526-5361
Fusion Inc., Willoughby, OH 44094 216-946-3300
§† Gardiner Solder Co., Div. of Gardiner Metal Co., Chicago, IL 60632 312-847-0100
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Hexacon Electric Co., Roselle Park, NJ 07204 201-245-6200
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Miller, L.C., Co., Monterey Pk., CA 91754 213-268-3611
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§† Multicore Solders, Westbury, NY 11590 516-334-7997
§† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945 617-631-7100
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§ Pace Inc., Laurel, MD 20707 301-490-9860
§ PanaVise Prods., Long Beach, CA 90806 213-595-7621
§ Plato Products, Inc., Glendora, CA 91740 800-423-4510
§ Roean Industries, Inc., Pacoima, CA 91331 818-767-7047
§ Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Ungar, Div. Eldon Inds., Inc., Buena Park, CA 90620 714-994-2510
† Unit Design, Fullerton, CA 92631 714-526-0800
§ Wall Lenk Corporation, Kinston, NC 28502-3349 919-527-4186
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

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Soldering Equipment, Induction Heating-4100 — ***See Vol. D***

Soldering Equipment, Infrared-4100 — ***See Vol. D***

Soldering Equipment, Printed Circuit-4100 — ***See Vol. D***

Soldering Equipment, Resistance-4100 — ***See Vol. D***

Soldering Systems, Temperature Controlled-4100 — ***See Vol. D***

Soldering Equipment, Ultrasonic-4100 — ***See Vol. D***

Soldering Equipment, Vapor Phase-4100 — ***See Vol. D***

Soldering Guns, Irons & Desoldering Tools-4600

† Air-Vac Engrg., Milford, CT 06460 203-874-2541
† Antex Division, Marblehead, MA 01945 617-631-7100
ASMD, Inc., San Diego, CA 92121 619-453-8111
Automated Production Concepts, Wayne, NJ 07470 201-831-8300
§† Automated Prod. Equip. Corp., Medford, NY 11763 516-654-1197
§† Chemtronics Inc., Hauppauge, NY 11788 ..... 516-582-3322;800-645-5244
§ Contact, Inc., Hudson, NH 03051 603-883-7708
† Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§† Edsyn, Inc., Van Nuys, CA 91406 ..... 818-989-2324;213-873-5115
ELVO:Division of Zumbach Electronics Corporation, Mt. Kisco, NY 10549 914-241-1008
§ ESICO/TRITON, Triton Industries Inc., Deep River, CT 06417 203-526-5361
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Heath Co., St. Joseph, MI 49085 616-982-3200
§ Hexacon Electric Co., Roselle Park, NJ 07204 201-245-6200
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Master Appliance Corp., Racine, WI 53403 414-633-7791
§ MG Electronics, Hauppauge, NY 11788 516-582-3400
† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945 617-631-7100
§ Nu-Concept Systems, Colmar, PA 18915 215-822-8400
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§ Pace Inc., Laurel, MD 20707 301-490-9860
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§† Plato Products, Inc., Glendora, CA 91740 800-423-4510
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Roean Industries, Inc., Pacoima, CA 91331 818-767-7047
§† Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§† Solder Removal, Covina, CA 91722 818-967-3681
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Ungar, Div. Eldon Inds., Inc., Buena Park, CA 90620 714-994-2510
Vector Electronic Co., Sylmar, CA 91342 818-365-9661
§† Wall Lenk Corporation, Kinston, NC 28502-3349 919-527-4186
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

Soldering Machines, Laser-4100 — ***See Vol. D***

Soldering (MIL)-2440 — ***See Vol. B***

Solenoids, Linear-4550 — ***See Vol. B***

Solenoids, Proportional-4550 — ***See Vol. B***

Solenoids, Rotary-4550 — ***See Vol. B***

Solenoids, Stepping-4550 — ***See Vol. B***

Solenoids (MIL)-2440 — ***See Vol. B***

Solvents — See Cleaners & Solvents (Vol. C)

S100 Bus — See Board Computers & Subassemblies (Vol. D)

Sound Absorbing Materials-2500

DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§ E-A-R Div., Cabot Corp., Indianapolis, IN 46268 317-872-1111
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Soundcoat Co., Inc., Deer Park, NY 11729-5701 516-242-2200
† Terminal Data Corp., Rockville, MD 20855 301-921-8282
§ Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Sound Level Indicators — See Meters, Audio Level (Vol. D)

Sound Recording Equip. — See Microphones (Vol. D), Recorders (Vol. D), etc.

Source & Detector Assemblies (SDAs)-3700 — ***See Vol. B***

Spacers-2500

All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1150
Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272
§ Bivar, Inc., Irvine, CA 92718, 714-951-8808 ..... C•1011
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313,1617
† Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151 ..... C•1733
Gasket Dynamics, Inc., Mt. Holly, NJ 08060, 609-261-8100;800-541-2500;215-922-6046 ..... C•1618
Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
§ Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
Scanbe, Unit of Zero Corporation, El Monte, CA 91731, 818-579-2300 ..... C•1089
† Unicorp, Orange, NJ 07050, 201-674-1700 ..... C•1628-1629
Alberox Corporation, New Bedford, MA 02745 508-995-1725
† Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
Auburn Mfg., Middletown, CT 06457 203-346-6677
Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Boker's, Inc., Minneapolis, MN 55406-1937 612-729-9365
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Delbert Blinn Co., Pomona, CA 91769 714-629-3900
§† Dynaloy, Inc., Hanover, NJ 07936 201-887-9270
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
Garner Glass Co., Claremont, CA 91711 714-624-5071
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Manufacturing, Glendale, CA 91201 818-243-2069
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150 312-350-8200
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
Micro Plastics Inc., Flippin, AR 72634 501-453-2261
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
§ Penn Engineering & Manufacturing Corp., Danboro, PA 18916 215-766-8853
† PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
§ Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
† Products Engrg. Corp., Azusa, CA 91702 818-969-5879
§ RAF Electronic Hardware, Seymour, CT 06483 203-888-2133
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
§ Schurter, Inc., Petaluma, CA 94952 707-778-6311
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
§ Standard Insert Co., Penn Engrg. & Mfg. Corp., Horsham, PA 19044 215-956-0350
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§ Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§ Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
Zero Corp., Burbank, CA 90503 818-846-4191

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Spark Gaps-4300 — ***See Vol. B***

Speakers, Explosion & Flame Proof-1300 — ***See Vol. D***

Speakers, Horn-1300 — *See Vol. D*

Speakers, Intercom-1300 — *See Vol. D*

Speakers, Midrange-1300 — *See Vol. D*

Speakers, Musical Instrument-1300 — *See Vol. D*

Speakers, Paging — See Speakers, Intercom (Vol. D)

Speakers, Pillow-1300 — *See Vol. D*

Speakers, Public Address-1300 — *See Vol. D*

Speakers, Replacement (Incl. Aircraft, Automotive & TV)-1300 — *See Vol. D*

Speakers, Submergence Proof-1300 — *See Vol. D*

Speakers, Subminiature-Also See Bells, Buzzers, Gongs, Sirens & Aural Warning Devices-1300 — *See Vol. D*

Speakers, Tweeter-1300 — *See Vol. D*

Speakers, Weatherproof-1300 — *See Vol. D*

Speakers, Woofer-1300 — *See Vol. D*

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Speaker Systems-1300 — *See Vol. D*

Spectrometers-2900 — *See Vol. D*

Speech Compression & Synthesis Equipment-2325 — *See Vol. D*

Speed Drives, Motor — See Controls, Motor Speed (Vol. D)

Spiral Wrap — See Tubing, Spiral Wrap (Vol. C)

Splicers, Coaxial Cable-5400

§ AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677

Splicers, Fiber Optic-2475 — *See Vol. B*

Splicers, Wire (Incl. Butt & Cap Types)-5400

† AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
Accurate Electronics, Elyria, OH 44036 216-366-6330
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033 ..... 201-245-0033;800-526-4182
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§† Sonobond Ultrasonics Inc., Inductotherm Industries, West Chester, PA 19380 ..... 215-696-4710;800-323-1269
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549 ..... 914-666-2911;800-882-8020

Splices-2100

§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Pomona Electronics, Pomona, CA 91766 714-623-3463

Splices, Fiberoptic-2475 — *See Vol. B*

Splicing Equipment, Fiber Optic-5400

Custom Sci. Instrs., Cedar Knolls, NJ 07927 201-538-8500
† Foundation Instruments Inc., Nepean, ON, CANADA K2E 7J6 613-226-4000
§† General Cable Co., Fiber Optics Div., S. Plainfield, NJ 07080 201-769-3200
† INTELCO, Acton, MA 01720 508-264-4485
† Interoptics, Purdy Group, Burlingame, CA 94010 415-347-7727
§ 3M Fiber Optic Products, Inc., W. Haven, CT 06516 203-934-7961
† Power Technology, Inc., Little Rock, AR 72219 501-568-1995
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677

Splicing Equipment, Magnetic Tape-1300 — *See Vol. D*

Splitters/Combiners, Power — See Dividers, Power (Vol. A)

Spoolers, Printer Buffers-2325 — *See Vol. D*

Spoolers, Punched Tape — See Readers, Punched Tape (Vol. D)

Springs (All Types)-2500

Graphite Metallizing Corp., Yonkers, NY 10702, 914-968-8400 ..... B•1252
Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
† Associated Spring, Barnes Grp., Bristol, CT 06010 203-583-1331
Autoswage Products, Shelton, CT 06484 203-929-1401
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Instrument Specialties Co., Delaware Water Gap, PA 18327 717-424-8510
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
† Mueller Elec. Co., Cleveland, OH 44114 216-771-5225
† Omega Precision Corp., Cedar Grove, NJ 07009 201-256-3422
† PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
† Products Engrg. Corp., Azusa, CA 91702 818-969-5879
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700

Stabilizers, Current — See Current Sources (Vol. D), Regulators, Current (Vol. D)

Stabilizers, Line Impedance-4050 — *See Vol. D*

Stabilizers, Voltage — See Regulators & Stabilizers, Voltage (Vol. D), Transformers, Voltage Regulating (Vol. A), Voltage Sources (Vol. D)

Stabilizers, Voltage/Current, Automatic — See Power Supplies, Constant Current (Vol. D)

Stalos (Stabilized Local Oscillators) — See Oscillators, Microwave (Vol. A)

Stampings, Precious Metal — See Preforms, Precious Metal (Vol. C)

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Standards, Capacitance-2900 — *See Vol. D*

Standards, Current-2900 — *See Vol. D*

Standards, Delay Line-2350 — *See Vol. A*

Standards, Frequency-2900 — *See Vol. D*

Standards, Inductance-2900 — *See Vol. D*

Standards, Magnetic Field-2900 — *See Vol. D*

Standards, Noise-2900 — *See Vol. D*

Standards, Phase-2900 — *See Vol. D*

Standards, Phase Angle-2900 — *See Vol. D*

Standards, Resistance-2900 — *See Vol. D*

Standards, Temperature-2900 — *See Vol. D*

Standards, Time-2900 — *See Vol. D*

Standards, Voltage-2900 — *See Vol. D*

Standards, Voltage Ratio-2900 — *See Vol. D*

Standoffs — See Bushings, Glass, Plastic, Metal, etc. (Vol. C)

Standoffs, PCB-2500

§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312-1313,1617
Unicorp, Orange, NJ 07050, 201-674-1700 ..... C•1628-1629
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
Jan Hardware Mfg. Co., Long Island City, NY 11101 718-361-0800
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§† Penn Engineering & Manufacturing Corp., Danboro, PA 18916 215-766-8853
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
§† Standard Insert Co., Penn Engrg. & Mfg. Corp., Horsham, PA 19044 215-956-0350
§ Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291

Stands, Instruments-1400

§ Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
D. L. Custom, Markham, Ont, CANADA L3R 2M5, 416-475-0275 ..... C•1021
† Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ..... C•1040,1044,1050-1051
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Hodge Manufacturing Co., Inc., Springfield, MA 01107 413-781-6800
Mobile-Tronics Co., Inc., Tustin, CA 92680 714-546-0884
Omega Engineering, Stamford, CT 06907 800-826-6342
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Zero Corp., Burbank, CA 90503 818-846-4191

Stands, Instrument, Tilting-1400

Buckeye Stamping Co., Columbus, OH 43207, 614-445-8433 ..... C•1013
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§ Hodge Manufacturing Co., Inc., Springfield, MA 01107 413-781-6800
Leader Instruments Corp., Hauppauge, NY 11788-3694 516-231-6900
Mobile-Tronics Co., Inc., Tustin, CA 92680 714-546-0884
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900

Stands, Printer/Terminal-1400

D. L. Custom, Markham, Ont, CANADA L3R 2M5, 416-475-0275 ..... C•1021
† Equipto Electronics Corp., Aurora, IL 60506, 312-897-4691 ..... C•1040,1045-1047,1052
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062
Ritz Electronics/Relco, New Dundee, Ont., CANADA NOB 2EO, 519-696-2616 ..... C•1087
U.S. Power Converting Company/Relco, Leonard V. Snow & Assocs., Torrance, CA 90503, 213-316-9984 ..... C•1087
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
§ Ergotron, Inc., Eagan, MN 55121 612-452-8135
General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
Hewlett-Packard Co., Cupertino, CA 95014 800-752-0900
Mobile-Tronics Co., Inc., Tustin, CA 92680 714-546-0884
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900
Tektronix, Inc., Beaverton, OR 97077 800-835-9433
† Terminal Data Corp., Rockville, MD 20855 301-921-8282

Starters, Motor, Solid State-3500 — *See Vol. B*

Static Eliminating Materials, Devices, & Equipment-4525

Electra-Tec, Impert Industries, Inc., Otsego, MI 49078, 800-225-3532;616-694-2058 ..... C•1026
Instrument Specialties Co., Delaware Water Gap, PA 18327, 717-424-8510 ..... C•1737
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438
§† NRD Inc., Subsidiary of Mark IV Inds., Inc., Grand Island, NY 14072, 716-773-7634 ..... D•2244
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
Schlegel Corp., Rochester, NY 14692, 716-427-7200 ..... C•1747
† Static Control Systems/3M Electrical, Products Div., Austin, TX 78769-2963, 800-328-1368 ..... D•2242-2243
† Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749
† Acheson Colloids, Div. of Acheson Industries, Inc., Port Huron, MI 48061-1747 313-984-5581
§† ACL Inc., Elk Grove, IL 60007 ..... 312-981-9212;800-STATIC-0
§† ADE, Inc., Chicago, IL 60633 312-646-3400
§ Amherst International Corp., Cover Craft Div., Manchester, NH 03101 ..... 603-644-3555; 1-800-547-5600
† Chapman Corp., Portland, ME 04104 207-773-4726
† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§ Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
§ Clean Room Prods., Ronkonkoma, NY 11779-6528 516-588-7000
† Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
Eagle Magnetic Company, Inc., Indianapolis, IN 46224 317-297-1030
§† Fancort Industries, Inc., W. Caldwell, NJ 07006 201-575-0610
† Gordon, L., Packaging, Baltimore, MD 21230 301-539-6537
§ Herbert Prods. Inc., Westbury, NY 11590-0384 516-334-6500
† LNP Engineering Plastics, Div. of ICI Americas, Malvern, PA 19355 215-644-5200
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Merix Chemical Co., Chicago, IL 60649 312-221-8242
§ NTE Electronics, Inc., Bloomfield, NJ 07003 201-748-5089
§ Nu-Concept Systems, Colmar, PA 18915 215-822-8400
§† Plato Products, Inc., Glendora, CA 91740 800-423-4510
§ S & H Inds., Hatfield, PA 19440 215-822-7211
§ Semtronics Corp., Peachtree City, GA 30269 404-487-6681
§† Simco Co., Hatfield, PA 19440 215-822-2171
§ Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Spectrascan, Inc., Colorado Springs, CO 80907 719-599-9254
† Stanley-Vidmar, Stanley Works, Allentown, PA 18103 215-797-6600
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Tech Spray, Inc., Amarillo, TX 79105 806-372-8523
§† Trio-Tech International, San Fernando, CA 91340 818-365-9200
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 312-956-8000
§† Wescorp Antistatic Products, Mountain View, CA 94041 415-969-7717

Stators, Motor & Generator — See Motor & Generator Armatures,Rotors, Stators (Vol. B)

STD Bus — See Board Computers & Subassemblies (Vol. D)

Steppers, Indexing, Motor-3500 — *See Vol. B*

Steppers, Indexing, Switch-5100 — *See Vol. B*

Stiffeners, PCB, Glass Epoxy-1700

† Cut Craft, Inc., Ft. Worth, TX 76102, 817-332-6151 ..... C•1733
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140

Storage Equipment, Cartridge/Cassette-1400

Phi Technologies, Inc., Oklahoma City, OK 73105, 405-521-9000 ..... D•1048
POLYCASE PRODS., ECP Corp., Cleveland, OH 44103, 216-391-0444 ..... C•1077
§ Algo, Inc., Columbia, MD 21045 301-730-7442
Analog & Digital Peripherals, Inc.(ADPI), Troy, OH 45373 513-339-2241
§ Digi-Data Corp., Jessup, MD 20794 301-498-0200
§ Equipto, Aurora, IL 60506 ..... 312-859-1000;800-323-0801

Storage Equipment, Disk-1400

Computer Maintenance Corp., East Rutherford, NJ 07073 201-896-0707
§ Fujitsu America, Inc., Computer Products Group, San Jose, CA 95134 ... 408-432-1300
Harris Corp., Computer Systems Div., Ft. Lauderdale, FL 33309 305-974-1700
RACET Computes, Ltd., Brea, CA 92621 714-579-1725
Vermont Research Corp., N. Springfield, VT 05150 802-886-2256

Storage Equipment, Flexible Disk-1400

Analog & Digital Peripherals, Inc.(ADPI), Troy, OH 45373 513-339-2241
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
§ Fujitsu America, Inc., Computer Products Group, San Jose, CA 95134 ... 408-432-1300

Storage Equipment, Magnetic Card-1400

§ Equipto, Aurora, IL 60506 ..... 312-859-1000;800-323-0801
Xico, Inc., Chatsworth, CA 91311 818-709-4403

Storage Equipment, Multifunctional-1400

§ Lyon Metal Products, Aurora, IL 60507 312-892-8941
§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603
† Stanley-Vidmar, Stanley Works, Allentown, PA 18103 215-797-6600

Storage Equipment, Printout-1400

§† Stackbin Corp., Lincoln, RI 02865 ..... 401-333-1600;800-333-1603

Storage Equipment, Reel-to-Reel Tape-1400

† Data Capture Technology, Hathaway Corp., Tulsa, OK 74116 918-438-5366
§ Digi-Data Corp., Jessup, MD 20794 301-498-0200
§ Equipto, Aurora, IL 60506 ..... 312-859-1000;800-323-0801
§ Fujitsu America, Inc., Computer Products Group, San Jose, CA 95134 ... 408-432-1300
Harris Corp., Computer Systems Div., Ft. Lauderdale, FL 33309 305-974-1700
RACET Computes, Ltd., Brea, CA 92621 714-579-1725

Storage Racks, Circuit Board-1400

§† Fancort Industries, Inc., W. Caldwell, NJ 07006 201-575-0610
§† Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110

Strain Reliefs, Cable & Wire-2500

AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ..... C•1297,1299
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Bopla Enclosures, Frederick, MD 21701 301-696-9300
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Chabin Corp., Chico, CA 95926 916-891-6410
Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Compac, Holbrook, NY 11741 516-585-3400
Component Mfg. Svc., Inc., W. Bridgewater, MA 02379 508-580-0111
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Elco Corp., Electronic Connector Div., Huntingdon, PA 16652 814-643-0700
§ Excel Specialty Corp., Chicago, IL 60660 312-262-4781
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Harwil, Santa Monica, CA 90404 213-829-2310
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
Markel Corp., Norristown, PA 19404 215-272-8960
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
† Micro Plastics Inc., Flippin, AR 72634 501-453-2261
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945 617-631-7100
§ Olflex Wire & Cable, Inc., Fairfield, NJ 07006 201-575-1101
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
Techdyne, Inc., Lance Wire & Cable Div., Hamden, CT 06514 203-288-5571
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1152
AMP, Harrisburg, PA 17105, 717-564-0100 ..... C•1157
§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 ..... C•1584,1726
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1570
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1565,1570
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
Precision Fabrication Technologies, Inc., Monon, IN 47959 ..... 1-800-558-7297; 219-253-6666
§ Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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Substrates, Ceramic-2500

AVX Corporation, Myrtle Bch., SC 29577, 803-448-9411 ..... A•1019
† Electro-Films, Inc., Warwick, RI 02886, 401-738-9150 ..... A•1781
† Hybridyne, Inc., Tucson, AZ 85745, 602-629-0001 ..... A•1745
Mini-Systems, Inc., Thick/Thin Film Division, North Attleboro, MA 02761, 508-695-0203 ..... A•1997
§ NTK Technical Ceramics, NGK Spark Plugs (USA), Inc., Springfield, NJ 07081, 201-376-6070 ..... A•1710
† Accumet Engineering, Hudson, MA 01749 508-568-8311
Allen Bradley Co., Electronic Components Div., A Rockwell International Co., El Paso, TX 79936 ..... 915-592-4888;800-592-4888
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§† California Micro Devices, Inc., Milpitas, CA 95035 408-263-3214
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
† Circuit Technology Inc., Farmingdale, NY 11735 516-293-8686
† Compex Corp., Medford, NJ 08055 609-596-9388
Coors Ceramics Co., Golden, CO 80401 303-278-4000
§ Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
Dielectric Labs., Cazenovia, NY 13035 315-655-8710
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
† Environmental Comm., Costa Mesa, CA 92627 714-557-7800
EPH Engineering Associates, Inc., Orem, UT 84058 801-226-1383
Frequency Electronics, Inc., Mitchel Field, NY 11553 516-794-4500
Honeywell Inc., Aerospace & Defense Grp., Minneapolis, MN 55408 612-870-5186
† Hycomp, Inc., Marlborough, MA 01752 508-485-6300
§† Kyocera Northwest, Electronic Components Group, Vancouver, WA 98661 206-696-2840
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
§† MERET, Inc., Santa Monica, CA 90404-4998 213-828-7496
† Microplex, Inc., Anaheim, CA 92806 ..... 714-979-8833;714-634-1535
Mini-Systems, Inc., Sunbelt Microelectronic Division, Deltona, FL 32725 407-574-0208
§ Murata Erie North America, Inc., Smyrna, GA 30080 404-436-1300
PCK Technology Div., Kollmorgen Corp., Melville, NY 11747 516-454-4400
† Quartzite Processing, Inc., Malden, MA 02148 617-322-3611
Sanders Associates, Inc., ECBD, A Lockheed Company, Manchester, NH 03108-8500 603-645-5548
§ TDK Corporation, Electronic Components & Material, Tokyo, JAPAN 103 ..... (03) 278-5111
† Teledyne Microelectronics, Los Angeles, CA 90066 ..... 213-822-8229;213-870-9831
† Union Carbide Corporation, Industrial Chemicals Div., Crystal Products Dept., San Diego, CA 92123 619-279-4500
United Supertek, Inc., San Jose, CA 95131-1101 408-922-0730

Substrates, Flexible-2500

International Resistive Company, Boone, NC 28607, 704-264-8861 ..... A•1747
NTK Technical Ceramics, NGK Spark Plugs (USA), Inc., Springfield, NJ 07081, 201-376-6070 ..... A•1710
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357

Substrates, Glass-2500

† Accumet Engineering, Hudson, MA 01749 508-568-8311
† Atlantic Optical Moulding, Webster, MA 01570 617-943-1746
§† California Micro Devices, Inc., Milpitas, CA 95035 408-263-3214
Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
§† Ercona, Patchogue, NY 11772 516-758-0700
Frequency Electronics, Inc., Mitchel Field, NY 11553 516-794-4500
† Hycomp, Inc., Marlborough, MA 01752 508-485-6300
KLC/Karl Lambrecht Corp., Chicago, IL 60618 312-472-5442
† Melles Griot, Inc., Irvine, CA 92714 714-261-5600
Schott Glass Technologies, Inc., Duryea, PA 18642 717-457-7485

Substrates, Metallic-2500

International Resistive Company, Boone, NC 28607, 704-264-8861 ..... A•1747
International Sensor Systems, Inc., Aurora, NE 68818, 402-694-6111 ..... A•1748-1749
NTK Technical Ceramics, NGK Spark Plugs (USA), Inc., Springfield, NJ 07081, 201-376-6070 ..... A•1710,1853
Accumet Engineering, Hudson, MA 01749 508-568-8311
† Alpha Industries, Inc., Woburn, MA 01801 617-935-5150
Bergquist, Minneapolis, MN 55435 800-328-3882
§† California Micro Devices, Inc., Milpitas, CA 95035 408-263-3214
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† Hycomp, Inc., Marlborough, MA 01752 508-485-6300
Lincoln Laser Co., Phoenix, AZ 85004 602-257-0407
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Philips Elmet, Lewiston, ME 04240 207-784-3591

Substrates, Sapphire-2500

† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§† California Micro Devices, Inc., Milpitas, CA 95035 408-263-3214
† Saphikon, Inc., Milford, NH 03055 603-673-5831
† Union Carbide Corporation, Industrial Chemicals Div., Crystal Products Dept., San Diego, CA 92123 619-279-4500

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§ **Carlingswitch, Inc., Plainville, CT 06062-1156, 203-793-9281** ..... **B•1697**
§ **Electro-Mech Components, Inc., South El Monte, CA 91733-3689, 818-442-7180** ..... **B•1729**
§ **ITW Switches, Illinois Tool Works, Chicago, IL 60634, 312-282-4040** ..... **B•1762**
§ **Mechanical Enterprises, Herndon, VA 22070, 703-435-9496** ..... **B•1801**
§† **Oak Switch Systems, Crystal Lake, IL 60014, 815-459-5000** ..... **B•1822**
Adams Rite Products, Inc., Glendale, CA 91204 818-241-5121
APM-Hexseal, Englewood, NJ 07631 201-569-5700
Arcolectric Corp., Canoga Park, CA 91304 818-700-1933
§† Arrow Hart Components, Cooper Industries, Charlottesville, VA 22906-9050 804-974-5100
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
§ Augat Alcoswitch, Augat Inc., N. Andover, MA 01845 508-685-4371
C & K Components, Inc., Newton, MA 02158-1082 617-964-6400
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
CRL Compns., Inc., A Cambridge Elctrn. Inds. Co., Fort Dodge, IA 50501 .. 515-573-1300
§ DSA, Inc.(Dai-Ichi Shoji of America), Div. of Leader Instruments, New York, NY 10011 212-691-9050
§† Eaton Corp./MSC Products, Costa Mesa, CA 92627 714-642-2427
§† Eaton Corp./Cutler-Hammer Prods, Aerospace & Commercial Controls Div., Milwaukee, WI 53216 414-449-7487
† Electrospace Systems, Inc., Richardson, TX 75083-1359 ..... 214-470-2106/2107
§† FISHERCAST, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
§ Gaynor Electric Co., Thomaston, CT 06787-0316 203-283-4388
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Grayhill Inc., La Grange, IL 60525 708-354-1040
ITT Schadow, Eden Prairie, MN 55344 612-934-4400
Janco Corp., Burbank, CA 91504 818-846-1800
Judco Mfg. Inc., Harbor City, CA 90710 213-534-0959
§ MEC A/S, Ballerup, DENMARK DK-2750 011-4542973366
§ Micro Switch, A Honeywell Div., Freeport, IL 61032 815-235-6600
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Radio Switch Corp., Marlboro, NJ 07746 201-462-6100
Relay Service Co., Chicago, IL 60651 312-252-2700
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Switchcraft, Inc., A Raytheon Company, Chicago, IL 60630 312-792-2700
Veetronix, Inc., Lexington, NE 68850 308-324-4600

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§† **AME Corporation, Towaco, NJ 07082-0195, 201-263-1700** ..... **B•1678**
† **Otto Controls, Otto Engineering, Carpentersville, IL 60110, 312-428-7171** ..... **B•1829**
† APM-Hexseal, Englewood, NJ 07631 201-569-5700
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§ Arrow Hart Components, Cooper Industries, Charlottesville, VA 22906-9050 804-974-5100
Augat Inc., Attleboro, MA 02703 617-222-2202
§ Augat Alcoswitch, Augat Inc., N. Andover, MA 01845 508-685-4371
§† C.P. Clare Corp., Chicago, IL 60645 312-262-7700
§† Eaton Corp./MSC Products, Costa Mesa, CA 92627 714-642-2427
§ Eaton Corp./Cutler-Hammer Prods, Aerospace & Commercial Controls Div., Milwaukee, WI 53216 414-449-7487
§† EECO Incorporated, Santa Ana, CA 92702-0659 714-835-6000
Micro Switch, A Honeywell Div., Freeport, IL 61032 815-235-6600
§† Risk, George, Inds., Kimball, NE 69145 308-235-4645
§ Spemco Switches, St. Clair Shores, MI 48080 800-482-2828
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500

Swivel Units, Data Entry Terminals-1400

§ Ergotron, Inc., Eagan, MN 55121 612-452-8135
Par Metal Products, Inc., Brooklyn, NY 11216 718-774-5900

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§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... **C•1826**
§† **Markel Corp., Norristown, PA 19404, 215-272-8960** ..... **C•1698**
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... **C•1438**
Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§† CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
† Cut Craft, Inc., Ft. Worth, TX 76102 817-332-6151
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§ Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§† Moxness Products, Inc., Versa Technologies, Racine, WI 53405 ..... 414-554-5050; 800-558-5706
Okonite Co., Ramsey, NJ 07446 201-825-0300
† Press-On Products, Addison, IL 60101 312-628-2255
Rogers Corporation, Circuit Materials Div., Chandler, AZ 85244 602-963-4584
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Vidaire Electronics Mfg. Corp., W. Babylon, NY 11704 516-491-1826

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Acme Division, Allied Products Corporation, New Haven, CT 06505 203-562-2171
Ad-Vance Magnetics, Inc., Rochester, IN 46975 219-223-3158
Auburn Mfg., Middletown, CT 06457 203-346-6677
§ Bishop Graphics, Inc., Agoura, CA 91304 818-991-2600
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§† CHR Industries, Inc., Fluorcarbon Co., New Haven, CT 06509 203-777-3631
† Cut Craft, Inc., Ft. Worth, TX 76102 817-332-6151
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
§ Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
§ Gasket Dynamics, Inc., Mt. Holly, NJ 08060 ..... 609-261-8100;800-541-2500; 215-922-6046
GM Nameplate, Inc., Seattle, WA 98119 206-284-2200
§ Injectorall Electronics (Woman Owned), Bohemia, NY 11716 516-563-3388
Markem Corp., Keene, NH 03431 603-352-1130
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
† Press-On Products, Addison, IL 60101 312-628-2255
§ Tapecon, Inc., Rochester, NY 14612 716-621-8400

§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
† Tecknit (Eastern Facility), Cranford, NJ 07016 201-272-5500
§ Tegal Scientific, Inc., Concord, CA 94524 415-827-1054
† Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
§ Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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§ Computerware, Inc., Vienna, VA 22180 703-821-8200
DuPont de Nemours, E. I., & Co., Wilmington, DE 19898 302-773-3218
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
§ Recoton Corp., Long Island City, NY 11101 718-392-6442
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130

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Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... B•1823,1912-1913,1988, C•1907, D•1015,1102,1154,1196,1331,1414
† Analog Devices, Inc., Norwood, MA 02062-9106 617-329-4700
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Bishop Graphics, Inc., Agoura, CA 91304 818-991-2600
† D.A.T.A., Inc., International Thomson Organization, San Diego, CA 92126 619-578-7600
§ E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
Feedback, Berkeley Hghts., NJ 07922 201-464-5181
§ Heath Co., St. Joseph, MI 49085 616-982-3200
Instrument Specialties Co., Delaware Water Gap, PA 18327 717-424-8510
§ International Rectifier Corp., Semiconductor Div., El Segundo, CA 90245 213-772-2000
§ Motorola Semiconductor Prods. Sector, Phoenix, AZ 85018-6606 602-244-6900
Powerex, Westinghouse, GE, Mitsubishi, Youngwood, PA 15697 412-925-7272
§† TAB BOOKS, Blue Ridge Summit, PA 17294-0850 717-794-2191
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§ Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1289
§ Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1319
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§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... C•1586
§† Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ..... C•1394
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1448-1449
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1563,1565,1568-1569,1572,1574
§† WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563,1565,1568-1569,1572,1574
§ Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ..... C•1576
† Accurate Electronics, Elyria, OH 44036 216-366-6330
† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
Alberox Corporation, New Bedford, MA 02745 508-995-1725
§ Allen-Bradley Co., Industrial Control Div., Milwaukee, WI 53201 414-382-2000
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§ Alpha Dist. Corp., Richfield, OH 44286 216-659-7100
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Amerace Corporation, Hackettstown, NJ 07840 201-852-1122
§ AMP, Harrisburg, PA 17105 717-564-0100
Arcolectric Corp., Canoga Park, CA 91304 818-700-1933
Ark-Les, Watertown, MA 02172 617-924-2330
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247 603-524-5101
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
† Caton Connector Corp., Kingston, MA 02364 617-585-4315
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Custom Connector, Cleveland, OH 44114 216-241-1679
Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
Dowty Interconnect, Dowty Electronic Components LTD, High Wycombe, Bucks, ENGLAND HP10 9UT 0-628-810810
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
§ Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
FIC Corp., Rockville, MD 20852 ..... 301-881-8124;800-638-6594
† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Gould Shawmut, Newburyport, MA 01950 ..... 508-462-6662/3131
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ IDEC Corporation, Sunnyvale, CA 94089-2211 408-747-0550
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Marathon Special Prods., Bowling Green, OH 43402 419-352-8441
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
Multi-Amp Corp., TBG, Dallas, TX 75237 214-333-3201
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Omega Engineering, Stamford, CT 06907 800-826-6342
Panel Components Corp., Santa Rosa, CA 95406 707-523-0600
§ PCD, Peabody, MA 01960 508-532-8800
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§ Relay Specialties, Oakland, NJ 07436 201-337-1000
§ Reliance Comm/Tec, Reliance Electric, Cleveland, OH 44199 800-245-4501
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121
Selco Products Co., SEL Sales, Inc., Buena Park, CA 90621 714-521-8673
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
§ Square D Co., Palatine, IL 60067 312-397-2600
Staffall Inc., Cranston, RI 02910 401-461-5554
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§ Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Trimm, Inc., Div. of Newton Instr. Co., Libertyville, IL 60048 312-362-3700
§ USD Products, Cooper Industries, Chicago, IL 60656 312-867-4600
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Wago Corp., Brown Deer, WI 53223 414-354-5511

Terminal Blocks, DIN Rail Mounting-2100

WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... C•1563
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563
§ Allen-Bradley Co., Industrial Control Div., Milwaukee, WI 53201 414-382-2000
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Syracuse Elctrns. Div. of Pass & Seymour, Syracuse, NY 13221 315-488-4911
§ Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Weidmuller, Inc., Richmond, VA 23236 804-794-2877

Terminal Blocks, Panel Mounting-2100

§ Altech Corp., Somerville, NJ 08876, 201-359-4454 ..... C•1154-1155
Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ..... C•1290-1291
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... C•1319
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1563,1565,1567-1568,1570-1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563,1565,1567-1568,1570-1574
Milross Controls, Inc., Southampton, PA 18966 215-355-0200
PCD, Peabody, MA 01960 508-532-8800
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700

Struthers-Dunn Industrial & Commerical Relays, Sub. of Nytronics, Inc., Darlington, SC 29532 ... 803-393-5421
Weidmuller, Inc., Richmond, VA 23236 ... 804-794-2877

Terminal Blocks, PC Board Mounting-2100

§ Altech Corp., Somerville, NJ 08876, 201-359-4454 ... C•1035,1151-1153
Bivar, Inc., Irvine, CA 92718, 714-951-8808 ... C•1011
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ... C•1319
§ Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ... C•1394
§ Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ... C•1448-1449
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ... C•1563-1573
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ... C•1563-1570,1572-1573
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ... C•1578
§ Custom Connector, Cleveland, OH 44114 ... 216-241-1679
Dixson, Inc., Grand Junction, CO 81503 ... 303-242-8863 (ext 223)
International Mircoelectronics, Arlington, TX 76003 ... 817-561-2244
Milross Controls, Inc., Southampton, PA 18966 ... 215-355-0200
Mouser Electronics, Mansfield, TX 76063 ... 800-346-6873
§ PCD, Peabody, MA 01960 ... 508-532-8800
§ Phoenix Contact, Harrisburg, PA 17111 ... 717-944-1300
§ Shokai Far East, Ltd., Hartsdale, NY 10530 ... 914-681-0700
§ Viking Connetors Co., Criton Technologies, Chatsworth, CA 91311 ... 818-341-4330

Terminal Boards-2100

Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ... C•1274
§ Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ... C•1289
Connector Corp., Chicago, IL 60646, 312-539-3108 ... C•1315
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ... C•1586
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... C•1568
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ... C•1565,1568
† Accurate Electronics, Elyria, OH 44036 ... 216-366-6330
Airflyte Elctrns. Co., Bayonne, NJ 07002 ... 201-436-2230
Allied Systems Corp., Greensboro, NC 27419 ... 919-299-2294
§ Altech Corp., Somerville, NJ 08876 ... 201-359-4454
Andon Elctrns. Corp., Lincoln, RI 02865 ... 401-333-0388
Ark-Les, Watertown, MA 02172 ... 617-924-2330
† Armel Electronics, N. Bergen, NJ 07047 ... 201-869-4201
Beau Products Div., Vernitron Corp., Laconia, NH 03247 ... 603-524-5101
Concord Electronics Corporation, New York, NY 10012 ... 1-212-777-6571
Curtis Industries, Milwaukee, WI 53218-0699 ... 414-535-1500
Doran Manufacturing Co., Cincinnati, OH 45225 ... 513-681-5424
Douglas Electronics, San Leandro, CA 94577 ... 415-483-8770
§ E & L Instruments, Interplex Electronics, Inc., New Haven, CT 06512 203-624-3103
§† Electronic Essentials, Woodside, NY 11377 ... 718-898-8300
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 ... 714-669-9473
FIC Corp., Rockville, MD 20852 ... 301-881-8124;800-638-6594
G W Three Incorporated, Springfield, VA 22153 ... 703-451-2043
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 ... 714-752-3800
International Mircoelectronics, Arlington, TX 76003 ... 817-561-2244
§† Keystone Electronics Corp., Astoria, NY 11105-2017 ... 718-956-8900
KMC Systems, Inc., Midland Pk., NJ 07432 ... 201-447-0007
† K-Systems of Texas, Inc., El Paso, TX 79936 ... 915-598-9769
† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
Mouser Electronics, Mansfield, TX 76063 ... 800-346-6873
National Tel-Tronics, Meadville, PA 16335 ... 814-724-6440
§ Reliance Comm/Tec, Reliance Electric, Cleveland, OH 44199 ... 800-245-4501
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ Shokai Far East, Ltd., Hartsdale, NY 10530 ... 914-681-0700
† Spruce Pine Mica Co., Spruce Pine, NC 28777 ... 704-765-4241
Staffall Inc., Cranston, RI 02910 ... 401-461-5554
Struthers-Dunn Industrial & Commerical Relays, Sub. of Nytronics, Inc., Darlington, SC 29532 ... 803-393-5421
§ Vector Electronic Co., Inc., Sylmar, CA 91342 ... 818-365-9661
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 ... 312-956-8000
§ Weidmuller, Inc., Richmond, VA 23236 ... 804-794-2877

Terminal Boards, Blocks, Strips (MIL)-2440 — *See Vol. B*

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Terminal Strips (Incl. Barrier Types)-2100

Acopian, Easton, PA 18044, 215-258-5441 ... D•1587
§ Altech Corp., Somerville, NJ 08876, 201-359-4454 ... C•1152,1155
Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ... C•1273-1274
§ Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ... C•1289
§ Beau Products Div., Vernitron Corp., Laconia, NH 03247, 603-524-5101 ... C•1290-1291,1293
Bussmann:Cooper Industries, St. Louis, MO 63178, 314-394-2877 ... C•1295
Connector Corp., Chicago, IL 60646, 312-539-3108 ... C•1315
§ Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ... C•1319
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ... C•1386
§† Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ... C•1586
§ Jolo Industries, Inc., Garden Grove, CA 92643, 714-554-6840 ... C•1394
Precision Interconnect, Portland, OR 97224, 503-620-9400 ... C•1917-1918
† Shogyo International Corp., Great Neck, NY 11021, 516-466-0911 ... C•1525,1920
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ... C•1564-1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ... C•1564-1574
§ Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ... C•1576
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ... C•1580
† Accurate Electronics, Elyria, OH 44036 ... 216-366-6330
Acme Model Engineering Co., Ridgefield, NJ 07657 ... 201-943-7650
§ Amerace Corporation, Hackettstown, NJ 07840 ... 201-852-1122
AMP, Harrisburg, PA 17105 ... 717-564-0100
Andon Elctrns. Corp., Lincoln, RI 02865 ... 401-333-0388
§ Ark-Les, Watertown, MA 02172 ... 617-924-2330
† Armel Electronics, N. Bergen, NJ 07047 ... 201-869-4201
Augat Inc., Attleboro, MA 02703 ... 617-222-2202
Autosplice, Inc., Woodside, NY 11377 ... 718-429-0500
§† Brim Electronics, Fair Lawn, NJ 07410 ... 201-796-2886
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 ... 312-981-6000
§ Concord Electronics Corporation, New York, NY 10012 ... 1-212-777-6571
§ Custom Connector, Cleveland, OH 44114 ... 216-241-1679
Doran Manufacturing Co., Cincinnati, OH 45225 ... 513-681-5424
Eldre Corporation, Rochester, NY 14623 ... 716-427-7280
§ Entrelec, Alsthom International, Spring Valley, NY 10977 ... 914-425-7460
FIC Corp., Rockville, MD 20852 ... 301-881-8124;800-638-6594
§ Ideal Industries, Sycamore, IL 60178 ... 815-895-5181
International Mircoelectronics, Arlington, TX 76003 ... 817-561-2244
§ ITT Sealectro, Trumbull, CT 06611 ... 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 ... 718-956-8900
§† Meco Industries, Mechanical Engraving Co., Inc., Bronx, NY 10470 212-324-4455
Mouser Electronics, Mansfield, TX 76063 ... 800-346-6873
§ National Tel-Tronics, Meadville, PA 16335 ... 814-724-6440
Omega Engineering, Stamford, CT 06907 ... 800-826-6342
§ Phoenix Contact, Harrisburg, PA 17111 ... 717-944-1300
§ Reliance Comm/Tec, Reliance Electric, Cleveland, OH 44199 ... 800-245-4501
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
Samtec, Inc., New Albany, IN 47150 ... 812-944-6733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 ... 914-681-0700
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 ... 401-461-8220
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 ... 714-996-0960
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 ... 408-988-0700
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 ... 415-965-4500
§ Syracuse Elctrns. Div. of Pass & Seymour, Syracuse, NY 13221 ... 315-488-4911
§ Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 ... 315-468-6211
§† Useco Div., Litton Inds, Van Nuys, CA 91409 ... 818-786-9388
§ Wago Corp., Brown Deer, WI 53223 ... 414-354-5511
§ Wall-Able Mfg. Corp., Elk Grove Vl, IL 60007 ... 312-956-8000

Terminals, Communications-2000 — *See Vol. D*

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Terminals, Crimp-2100

Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213 .. C•1374-1375
ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ... C•1386
JAE Electronics Inc., Santa Ana, CA 92705-5504, 714-250-8770 .... C•1390-1391
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ... C•1881
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ... C•1467,1909
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ... C•1557
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ... C•1580
Accurate Electronics, Elyria, OH 44036 ... 216-366-6330
§ AMP, Harrisburg, PA 17105 ... 717-564-0100
§† Brim Electronics, Fair Lawn, NJ 07410 ... 201-796-2886
§ Cole Hersee Co., Boston, MA 02127-2467 ... 617-268-2100
§ Concord Electronics Corporation, New York, NY 10012 ... 1-212-777-6571
§ JBT Intl. Inc., JI Haw Indl. Co., Ltd., Torrance, CA 90503 ... 213-328-0051
§† Keystone Electronics Corp., Astoria, NY 11105-2017 ... 718-956-8900
§ Pioneer Components, Brooklyn, NY 11234 ... 718-444-3880
§ Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311

Terminals, Data Display (Incl. Alphanumeric & Graphic)-2000 — *See Vol. D*

Terminals, Data Entry, Multimedia-2000 — *See Vol. D*

Terminals, Disconnecting-2100

Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213 .. C•1374-1375
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ... C•1909
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ... C•1563-1565,1567-1570,1572-1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ... C•1563-1565,1567-1574
Weidmuller, Inc., Richmond, VA 23236, 804-794-2877 ... C•1576
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ... C•1580
§ Altech Corp., Somerville, NJ 08876 ... 201-359-4454
§† Keystone Electronics Corp., Astoria, NY 11105-2017 ... 718-956-8900
Struthers-Dunn Industrial & Commerical Relays, Sub. of Nytronics, Inc., Darlington, SC 29532 ... 803-393-5421

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Terminals, Double Level-2100

WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ... C•1563-1564,1566,1568-1569
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ... C•1563-1566,1568-1569
§ Altech Corp., Somerville, NJ 08876 ... 201-359-4454
§ Panduit Corp., Tinley Park, IL 60477-0981 ... 800-777-3300
§ Phoenix Contact, Harrisburg, PA 17111 ... 717-944-1300

Terminals, Feedthru-2500

§† **Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571** ..... **C•1313**
Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... **C•1319**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
Elcom Systems, Inc., Boca Raton, FL 33487, 305-994-1774 ..... **A•1779**
§ **Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213** .. **C•1372-1373**
Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... **C•1586**
† **Oxley, Inc., Branford, CT 06405, 203-488-1033** ..... **B•1025**
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... **C•1580**
† Accurate Electronics, Elyria, OH 44036 216-366-6330
† Alberox Corporation, New Bedford, MA 02745 508-995-1725
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
† Compac, Holbrook, NY 11741 516-585-3400
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† General Manufacturing, Glendale, CA 91201 818-243-2069
† Hermetic Seal Corp., Rosemead, CA 91770 213-283-0411
† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§ Johnson, E. F., Co., Minneapolis, MN 55459-0089 612-942-1000
§ Jolo Industries, Inc., Garden Grove, CA 92643 714-554-6840
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
National Tel-Tronics, Meadville, PA 16335 814-724-6440
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Philips Elmet, Lewiston, ME 04240 207-784-3591
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
† Sterling Instruments, New Hyde Pk., NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§† Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877
§† Whitso, Schiller Pk., IL 60176 312-678-5200

Terminals, Ferrule, Cable-End-2100

Jan Hardware Mfg. Co., Long Island City, NY 11101, 718-361-0800 ..... **C•1586**
U.S. Terminals, Cincinnati, OH 45243, 513-561-8145 ..... **C•1557**
Alberox Corporation, New Bedford, MA 02745 508-995-1725
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Mark Eyelet Inc., AMP, Inc., Wolcott, CT 06716 203-756-8847
National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877

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Terminals, Fused-2100

Curtis Industries, Milwaukee, WI 53218-0699, 414-535-1500 ..... **C•1318**
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... **C•1563**
§ **WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136** ..... **C•1563**
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300

Terminals, Ground-2100

† **U.S. Terminals, Cincinnati, OH 45243, 513-561-8145** ..... **C•1557**
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
Staffall Inc., Cranston, RI 02910 401-461-5554
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136

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Terminals, Intelligent/Programmable, Multiprogramming-2000 — *See Vol. D*

Terminals, Intelligent/Programmable, Multiuser-2000 — *See Vol. D*

Terminals, Intelligent/Programmable, Real Time-2000 — *See Vol. D*

Terminals, Intelligent/Programmable, Transaction Processing-2000 — *See Vol. D*

Terminals, LED/Lamp Indicators-2100

WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 .... **C•1563**
§ **WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136** ..... **C•1563**
§ Allen-Bradley Co., Industrial Control Div., Milwaukee, WI 53201 414-382-2000
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300

Terminals, Lug (All Types)-2100

† **AMP, Harrisburg, PA 17105, 717-564-0100** ..... **C•1157**
§† **Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571** ..... **C•1312-1313**
Connector Corp., Chicago, IL 60646, 312-539-3108 ..... **C•1315**
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† Accurate Electronics, Elyria, OH 44036 216-366-6330
Alberox Corporation, New Bedford, MA 02745 508-995-1725
Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Ark-Les, Watertown, MA 02172 617-924-2330
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
§† Electronic Essentials, Woodside, NY 11377 718-898-8300
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
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§ Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
Thermotech Div. of Menasha Corp., Hopkins, MN 55343 612-933-9400
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
† U.S. Terminals, Cincinnati, CH 45243 513-561-8145
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§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4 514-694-9136

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Alberox Corporation, New Bedford, MA 02745 508-995-1725
Alden Products Co., Brockton, MA 02403 508-583-0160
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Ark-Les, Watertown, MA 02172 617-924-2330
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† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124

§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Burr-Brown Corp., Tucson, AZ 85734 602-746-1111
CBM America Corp., Santa Monica, CA 90404 213-828-8245
Ceramaseal, New Lebanon, NY 12125 518-794-7800
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Control Module, Enfield, CT 06082 203-745-2433
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† General Manufacturing, Glendale, CA 91201 818-243-2069
† Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
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§ Oyster Terminals, Santa Monica, CA 90401 213-395-4774
§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§† Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
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§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
SMK Electronics Corporation, U.S.A., Placentia, CA 92670 714-996-0960
Staffall Inc., Cranston, RI 02910 401-461-5554
Struthers-Dunn Industrial & Commerical Relays, Sub. of Nytronics, Inc., Darlington, SC 29532 803-393-5421
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§† Whitso, Schiller Pk, IL 60176 312-678-5200

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Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
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§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
† Caton Connector Corp., Kingston, MA 02364 617-585-4315
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Cosmo Corporation, Cleveland, OH 44109 216-861-5594
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
Douglas Electronics, San Leandro, CA 94577 415-483-8770
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§ Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
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† General Manufacturing, Glendale, CA 91201 818-243-2069
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
† Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
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Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
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§† Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
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Samtec, Inc., New Albany, IN 47150 812-944-6733
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
Staffall Inc., Cranston, RI 02910 401-461-5554
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§† Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Wago Corp., Brown Deer, WI 53223 414-354-5511
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Alberox Corporation, New Bedford, MA 02745 508-995-1725
Alden Products Co., Brockton, MA 02403 508-583-0160
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
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Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
§ Ark-Les, Watertown, MA 02172 617-924-2330
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
† Assembly Specialists, Acton, MA 01720 617-263-9100
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§ Cole Hersee Co., Boston, MA 02127-2467 617-268-2100
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Doran Manufacturing Co., Cincinnati, OH 45225 513-681-5424
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§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
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Mouser Electronics, Mansfield, TX 76063 800-346-6873
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§ Square D Co., Palatine, IL 60067 312-397-2600
Staffall Inc., Cranston, RI 02910 401-461-5554
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500

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§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
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§ Vaco Products, Chicago, IL 60645 312-677-9500
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
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§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
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† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§ Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
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† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
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§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
§ Positronic Industries, Inc., Springfield, MO 65801 417-866-2322
§† Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
† Sterling Instruments, New Hyde Pk, NY 11040 516-328-3300
† Techno, A DSG Company, New Hyde Park, NY 11040 516-328-3970
§† Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388

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§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312-1313
§ Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213 .. C•1372-1373
§† Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1447
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
† Accurate Electronics, Elyria, OH 44036 216-366-6330
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Armel Electronics, N. Bergen, NJ 07047 201-869-4201
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§ Augat/RDI, Carol Stream, IL 60188 312-682-4100
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Autoswage Products, Shelton, CT 06484 203-929-1401
§ Dabum Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§† Electrical Industries Corp., Murray Hill, NJ 07974 201-464-3200
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† General Manufacturing, Glendale, CA 91201 818-243-2069
Hypertronics Corp., Hudson, MA 01749 ..... 508-568-0451;800-225-9228
§† ITT Sealectro, Trumbull, CT 06611 203-372-4118
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Precicontact, Inc., Langhorne, PA 19047 215-757-1202
§† Precision Metal Products Co., Peabody, MA 01961-6026 508-532-5500
† Reeves-Hoffman Div., Dynamics Corporation of America, Carlisle, PA 17013 717-243-5929
§† Useco Div., Litton Inds, Van Nuys, CA 91409 818-786-9388
† U.S. Terminals, Cincinnati, OH 45243 513-561-8145
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§† Whitso, Schiller Pk, IL 60176 312-678-5200

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§ Augat/RDI, Carol Stream, IL 60188, 312-682-4100 ..... C•1288
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
Electronic Solutions, A Unit of Zero Corp., San Diego, CA 92121, 619-452-9333 ..... C•1029
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§† Mill-Max Manufacturing Corp., Oyster Bay, NY 11771-0300, 516-922-6000 ..... C•1447
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
§ Precicontact, Inc., Langhorne, PA 19047, 215-757-1202 ..... C•1510-1511,1513
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§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
† Accurate Electronics, Elyria, OH 44036 216-366-6330
§† Advanced Interconnections Corp., West Warwick, RI 02893 401-823-5200
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Andon Elctrns. Corp., Lincoln, RI 02865 401-333-0388
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
† Assembly Specialists, Acton, MA 01720 617-263-9100
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Autoswage Products, Shelton, CT 06484 203-929-1401
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§ BICC-VERO Electronics, Inc., Hamden, CT 06514 203-288-8001
§ Bussco Inc., El Segundo, CA 90245 213-322-6580
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
Circuit Assembly Corp., Irvine, CA 92718-2703 714-855-7887
† CTS Corporation, Connector Division, New Hope, MN 55428 612-533-3533
§ Dabum Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
Douglas Electronics, San Leandro, CA 94577 415-483-8770
§† DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
† E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
§ Entrelec, Alsthom International, Spring Valley, NY 10977 914-425-7460
§† Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
† General Manufacturing, Glendale, CA 91201 818-243-2069
Hybricon Corporation, Ayer, MA 01432 508-772-5422
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§ Methode Electronics, Inc., Chicago, IL 60656 312-867-9600
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Miniature Metal Forming Div., Torrance, CA 90509 213-370-3679
§ Mupac Corp., Carlo Gavazzi Co., Brockton, MA 02401 508-588-6110
§ National Tel-Tronics, Meadville, PA 16335 814-724-6440
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§† Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300

§ Phoenix Contact, Harrisburg, PA 17111 717-944-1300
§ Reliance Comm/Tec, Reliance Electric, Cleveland, OH 44199 800-245-4501
§ Reliance Electric Co., Marketing Info Center, Cleveland, OH 44199 800-245-4501
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
§ Samtec, Inc., New Albany, IN 47150 812-944-6733
† Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877
§† Whitso, Schiller Pk., IL 60176 312-678-5200

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† Airtron, Litton Industries, Inc., Morris Plains, NJ 07950 201-539-5500
† Alan Industries Inc., Columbus, IN 47201 812-372-8869
Autosplice, Inc., Woodside, NY 11377 718-429-0500
† Bird Electronic Corp., Cleveland, OH 44139-2794 216-248-1200
Coaxial Dynamics, Cleveland, OH 44135 ..... 1-800-COAXIAL
† Connecticut Microwave Corp., Canton, CT 06019 203-693-4247
§† Dielectric Communications, General Signal, Raymond, ME 04071 ..... 207-655-4555; 800-341-9678
† Elcom Systems, Inc., Boca Raton, FL 33487 305-994-1774
† Electro Impulse, Red Bank, NJ 07701-0870 201-741-0404
§† EMC Technology Inc, Cherry Hill, NJ 08034 609-429-7800
† Gabriel Electronics, Scarborough, ME 04074 207-883-5161
§ ITT Sealectro, Trumbull, CT 06611 203-372-4118
† JFW Industries, Inc., Indianapolis, IN 46237 317-887-1340
KDI/Triangle Electronics, Whippany, NJ 07981 201-887-5700
Lectronic Research Labs., Inc., Camden, NJ 08104 609-541-4200
† Maury Microwave Corp., Cucamonga, CA 91730 714-987-4715
† Microlab/FXR, Livingston, NJ 07039 201-992-7700
† Microwave Applications Group, Santa Maria, CA 93455 805-928-5711
Microwave Development Laboratories, Natick, MA 01760 617-655-0060
§† Microwave Filter Inc., East Syracuse, NY 13057-0486 .... 315-437-3953;800-448-1666
† Narda Microwave Corp., Subsidiary of Loral Corp., Hauppauge, NY 11788 516-231-1700
RLC Electronics, Inc., Mt. Kisco, NY 10549 914-241-1334
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Sage Laboratories, Inc., Natick, MA 01760 508-653-0844
Sjoberg, C. & Son, Inc., Cranston, RI 02910 401-461-8220
§† Systron-Donner Microwave Div., Van Nuys, CA 91409 818-786-1760
§† Waveline, W. Caldwell, NJ 07006 201-226-9100

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Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1313
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 .... C•1341-1342
Fischer Connectors, Valencia, CA 91355, 818-362-9395 ,800-344-0445 .. C•1355
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ISL Products Int'l, Ltd., Syosset, NY 11791-6093, 516-937-3475 ..... C•1386
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§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1467-1468,1909
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
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Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025, 415-361-3860 ..... C•1515
Remtek Corporation, Fremont, CA 94538, 415-490-3999 ..... C•1701
Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069, 818-707-2020 ..... C•1554
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1565
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1951
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 .. 203-743-9272
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
§† Bird Electronic Corp., Cleveland, OH 44139-2794 216-248-1200
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Chabin Corp., Chico, CA 95926 916-891-6410
Compac, Holbrook, NY 11741 516-585-3400
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† FISHERTECH, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
L-Com Inc., N. Andover, MA 01845 508-682-6936
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ MERET, Inc., Santa Monica, CA 90404-4998 213-828-7496
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
U.S. Instr. Rentals, San Mateo, CA 94403 800-824-2873
Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
Wide Band Engineering Co., Inc., Phoenix, AZ 85036 602-254-1570
§ Wiltron, Morgan Hill, CA 95037-2809 408-778-2000

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§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563-1565,1568,1570,1572,1574
§† ADC Telecommunications, Inc., Minneapolis, MN 55435 612-835-6800
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Eubanks Engineering, Monrovia, CA 91016 818-357-7011
§† FISHERTECH, Fisher Gauge Limited, Peterborough, Ontario, CANADA K9J 6Y9 705-748-9522
Jan Hardware Mfg. Co., Long Island City, NY 11101 718-361-0800
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
† Patton-MacGuyer Inc., Providence, RI 02905 401-941-6000

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§† Astro Tool Co., Inc., Beaverton, OR 97006, 503-642-9853 ..... **C•1751**
† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... **C•1753**
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... **C•1348**
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... **C•1466-1467**
Bearing Inspection, Santa Fe Springs, CA 90670 213-944-6251
§† Beau Tech, Portland, ME 04101 207-775-6139
† Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
Diversified Case Co., Whitesboro, NY 13492 ..... 800-553-2411;800-258-1188
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ General Hardware Mfg., New York, NY 10013 212-431-6100
§ Heath Co., St. Joseph, MI 49085 616-982-3200
† Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Micro Mode Prods., El Cajon, CA 92020 619-449-3844
§† Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911

Multi-Amp Corp., TBG, Dallas, TX 75237 214-333-3201
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Pace Inc., Laurel, MD 20707 301-490-9860
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
† Products Engrg. Corp., Azusa, CA 91702 818-969-5879
† Russtech Engineering Company, Inc., Mission Viejo, CA 92691 714-472-0880
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Vaco Products, Chicago, IL 60645 312-677-9500
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677

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§† Astro Tool Co., Inc., Beaverton, OR 97006, 503-642-9853 ..... C•1751
† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466-1467
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AMP, Harrisburg, PA 17105 717-564-0100
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
† Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hughes Aircraft Co., Microelctms. Sys. Div., Irvine, CA 92715 714-752-3800
ICC, Inc., Orange, CA 92665 714-998-8310
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Nepenthe, Inc., Palo Alto, CA 94303 ..... 415-856-9332;800-NEPENTHE
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
Omega Engineering, Stamford, CT 06907 800-826-6342
Pace Inc., Laurel, MD 20707 301-490-9860
† Ridge Tool Co., Sub. Emerson Elec. Co., Elyria, OH 44036 216-323-5581
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
† Russtech Engineering Company, Inc., Mission Viejo, CA 92691 714-472-0880
Symtron Corp. Div. Diceon Elctrns., Mountain View, CA 94043 415-965-4500
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
† Virginia Panel, Waynesboro, VA 22980 703-949-8376

Tools, Alignment & Tuning-5400

§† Astro Tool Co., Inc., Beaverton, OR 97006, 503-642-9853 ..... C•1751
Computer Doctors, College Park, MD 20740 ..... 1-800-RAM-STAR;301-474-3095
Contact East, N. Andover, MA 01845 508-682-2000
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
§ PTS Corporation, Bloomington, IN 47401 812-824-9331
Spectrol Electronics, City of Industry, CA 91745 818-964-6565
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Tools, Cable Tie-5400

§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848
† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1908
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Burndy Corporation, Norwalk, CT 06852 203-838-4444
Contact East, N. Andover, MA 01845 508-682-2000
§ Dennison Mfg. Co., Framingham, MA 01701 617-879-0511
Hanscom, H. F., Co., Inc., Providence, RI 02905 401-941-1455
Heyco Molded Products, Inc., Kenilworth, NJ 07033 ..... 201-245-0033;800-526-4182
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§† Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130

Tools, Connector-5400

Amphenol Corporation, Corporate Headquarters, Wallingford, CT 06492, 203-265-8910 ..... C•1266
§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1274
§† Astro Tool Co., Inc., Beaverton, OR 97006, 503-642-9853 ..... C•1751
§ Carrot Components Corporation, Camarillo, CA 93010, 805-484-0540 ... C•1299
† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
§ Emulation Technology, Inc., Santa Clara, CA 95051, 408-982-0660 ..... C•1348
§ Fujitsu of America, Santa Clara, CA 95054, 408-562-1000 ..... C•1362,1364
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1814-1815, C•1450-1451
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466-1468,1909
All-States, Inc., Chicago, IL 60640 312-728-0525
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
† AMP, Harrisburg, PA 17105 717-564-0100
§† Amphenol RF Operations, Amphenol Corporation, Danbury, CT 06810 203-743-9272
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ AVA Electronics Corporation, Drexel Hill, PA 19026 215-284-2500
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cambridge Products, Bloomfield, CT 06002 ..... 203-243-1761, 800-243-8814
§† Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
§† CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
† Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
DuPont Electronics, Wilmington, DE 19880-0013 800-237-4357
§† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§ Harris Corp., Dracon Div., Camarillo, CA 93010 805-987-9511
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033 ..... 201-245-0033;800-526-4182
Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
International Mircoelectronics, Arlington, TX 76003 817-561-2244
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
L-Com Inc., N. Andover, MA 01845 508-682-6936
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Micro Mode Prods., El Cajon, CA 92020 619-449-3844
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
OK Industries, Inc., Yonkers, NY 10701 914-969-6800
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ PanaVise Prods., Long Beach, CA 90806 213-595-7621
§ Penstock Engineering Labs., Penstock, Inc., Sunnyvale, CA 94086-4018 408-730-0300
Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
§ Robinson Nugent, Inc., New Albany, IN 47150 812-945-0211
† Russtech Engineering Company, Inc., Mission Viejo, CA 92691 714-472-0880
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Square D Co., Palatine, IL 60067 312-397-2600
Stanford Applied Engrg. Inc., Santa Clara, CA 95054 408-988-0700
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§ Vaco Products, Chicago, IL 60645 312-677-9500
Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
Vector Electronic Co., Sylmar, CA 91342 818-365-9661
† Virginia Panel, Waynesboro, VA 22980 703-949-8376
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677

Tools, Crimping & Swaging-5400

§† Astro Tool Co., Inc., Beaverton, OR 97006, 503-642-9853 ..... C•1751
† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1333
Hiram Jones Electronics, No. Hollywood, CA 91605, 213-875-0213 .. C•1373-1375
§ MOLEX, Inc., Lisle, IL 60532, 312-969-4550 ..... B•1814-1815, C•1451,1881
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1466-1468,1909
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
§ Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
Allied Systems Corp., Greensboro, NC 27419 919-299-2294
All-States, Inc., Chicago, IL 60640 312-728-0525
§ Altech Corp., Somerville, NJ 08876 201-359-4454
Amatom Electronic Hardware, New Haven, CT 06515 203-397-3311
§† AMP, Harrisburg, PA 17105 717-564-0100
§ Ark-Les, Watertown, MA 02172 617-924-2330
§ Augat Inc., Attleboro, MA 02703 617-222-2202
Augat, Inc., Interconnection Products Group, Attleboro, MA 02703 508-222-2202
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Bead Electronics, Div. Bead Industries, Inc., Bridgeport, CT 06605-0571 203-334-4124
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§ Cambridge Products, Bloomfield, CT 06002 ..... 203-243-1761, 800-243-8814
§ Cinch Connector Division, Labinal Components & Systems Inc., Elk Grove Village, IL 60007 312-981-6000
CINCH Cylindrical Division, Labinal Comps. & Systems, Inc., Minneapolis, MN 55428 612-537-1010
§ Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344

§ Compar, D.G.W. Electronics Corporation, Markham, Ontario, CANADA L3R 4Z4 416-475-8500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† Contact East, N. Andover, MA 01845 508-682-2000
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§† Flight Connector, TransTechnology Electronics, Peoria, IL 61615-1584 309-693-3300
§ Fujitsu of America, Santa Clara, CA 95054 408-562-1000
§ General Hardware Mfg., New York, NY 10013 212-431-6100
Hughes Aircraft Co., Connecting Devices Div., Irvine, CA 92714 714-660-5701
Hughes Aircraft Co., Microelctrns. Sys. Div., Irvine, CA 92715 714-752-3800
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
§† Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
Mac Panel Co., High Point, NC 27264 919-884-8111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Methode Electronics, Inc., Interconnect Prods Div, Rolling Meadows, IL 60008 312-392-3500
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ PanaVise Prods., Long Beach, CA 90806 213-595-7621
Parker Hannifin Corp., Cleveland, OH 44112-1290 216-531-3000
§ Philmore Manufacturing, Rockford, IL 61125-1386 815-229-7773
Schroff Incorporated, Schroff GMBH, Warwick, RI 02886 401-732-3770
† Sjoberg, C., & Son, Inc., Cranston, RI 02910 401-461-8220
§ Support Systems Intl. Corp., Richmond, CA 94804 415-234-9090
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
† Trompter Electronics, Inc., Sterling Holding, Westlake Village, CA 91359-5069 818-707-2020
§ Vaco Products, Chicago, IL 60645 312-677-9500
† Virginia Panel, Waynesboro, VA 22980 703-949-8376
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877

Tools, Heat Sealing-5400

Contact East, N. Andover, MA 01845 508-682-2000
§ Harwil, Santa Monica, CA 90404 213-829-2310
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Master Appliance Corp., Racine, WI 53403 414-633-7791
§ Pamran Inc., Racine, WI 53404 414-637-7999
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Tools, Lead Bending & Insertion-5400

§ Aries Electronics, Frenchtown, NJ 08825, 201-996-6841 ..... C•1272-1274
§† Beau Tech, Portland, ME 04101 207-775-6139
Contact East, N. Andover, MA 01845 508-682-2000
ELVO:Division of Zumbach Electronics Corporation, Mt. Kisco, NY 10549 914-241-1008
§ Eraser Co., Syracuse, NY 13221 315-454-3237
§† Excelta Corporation, Torrance, CA 90505 213-772-0751
§† Fancort Industries, Inc., W. Caldwell, NJ 07006 201-575-0610
§ Harwil, Santa Monica, CA 90404 213-829-2310
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Plato Products, Inc., Glendora, CA 91740 800-423-4510
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
Vector Electronic Co., Sylmar, CA 91342 818-365-9661

Tools, Magnetic Pickup-5400

§† Jobmaster Corp., Randallstown, MD 21133-0207, 301-655-1400;800-642-1400 ..... A•1329
Contact East, N. Andover, MA 01845 508-682-2000
† E-Z Hook, Tektest Inc., Arcadia, CA 91006 818-446-6175
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911
§ Orbit Industries, Countis Industries, Carson City, NV 89706 702-882-6123
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010

Tools, Marking, Numbering, Engraving-5400

All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1149
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1908
† Contact East, N. Andover, MA 01845 508-682-2000
† Control Laser Corp., Orlando, FL 32809 407-438-2500

Tools, Parts Handling, Vacuum Operated-5400

† Air-Vac Engrg., Milford, CT 06460 203-874-2541
Contact East, N. Andover, MA 01845 508-682-2000
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Orbit Industries, Countis Industries, Carson City, NV 89706 702-882-6123
Pace Inc., Laurel, MD 20707 301-490-9860
§ PanaVise Prods., Long Beach, CA 90806 213-595-7621
SC Technology, Inc., Livermore, CA 94550 415-373-9230
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Tools, Relay Servicing-5400

† Contact East, N. Andover, MA 01845 508-682-2000
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
GTE Switching & Telephone Products, Northlake, IL 60164 312-681-7100
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Multi-Amp Corp., TBG, Dallas, TX 75237 214-333-3201
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Tools, Resistance Soldering — See Soldering Equip., Resistance (Vol. C)

Tools, Wire Wrapping-5400

† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
DuPont Electronics, Wilmington, DE 19880-0013, 800-237-4357 ..... C•1333
Product Technology, Inc., Irvine, CA 92714, 714-474-8998 ..... C•1719
† Advance Wire & Cable, The Advance Group, Belmont, CA 94002 415-592-4550
Burndy Corporation, Norwalk,, CT 06852 203-838-4444
Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
† DataCon, Inc., Burlington, MA 01803 617-273-5800
Garry Electronics, Div. of Brintec Corp., Laghorne, PA 19047 215-949-2300
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ Instant Board Circuits Grp., Novato, CA 94949 415-883-1717
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ TELTEC, INC., Minneapolis, MN 55425 612-854-9632
§ Vector Electronic Co., Inc., Sylmar, CA 91342 818-365-9661
Vemaline Prods. Div., Warwick, RI 02887 401-739-7600
§ Wilson, H. F., Engineering Co., Glen Ellyn, IL 60137 312-469-8473

Torches, Soldering, Welding & Accessories-4600

Contact East, N. Andover, MA 01845 508-682-2000
§ Cooper Tools, Raleigh, NC 27622 919-781-7200
Henes Products, Phoenix, AZ 85034 602-275-4126
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Master Appliance Corp., Racine, WI 53403 414-633-7791
§ Pamran Inc., Racine, WI 53404 414-637-7999
§ Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§† Wall Lenk Corporation, Kinston, NC 28502-3349 919-527-4186

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Touch Terminals-2000 — ***See Vol. D***

Tracers, Curve-2900 — ***See Vol. D***

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Transducers, Force-5500 — ***See Vol. B***

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Transducers, Magnetic Pickup-5500 – *See Vol. B*

Transducers, Magnetostrictive-5500 – *See Vol. B*

Transducers, Piezoelectric-5500 – *See Vol. B*

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Transducers, Position, Rotary-5500 – *See Vol. B*

Transducers, Power – See Transducers, Volt, Watt, Currents, etc. (Vol. B)

Transducers, Pressure-5500 – *See Vol. B*

Transducers, Proximity-5500 – *See Vol. B*

Transducers, Sonic-5500 – *See Vol. B*

Transducers, Strain Gauge-5500 – *See Vol. B*

Transducers, Temperature-5500 – *See Vol. B*

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Transducers, Torque-5500 – *See Vol. B*

Transducers, Ultrasonic-5500 – *See Vol. B*

Transducers, Velocity-5500 – *See Vol. B*

Transducers, Vibration-5500 – *See Vol. B*

Transducers, Volt, Watt, Current VAR, Power Factor, Frequency-5500 – *See Vol. B*

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Transformers, Constant Voltage-5600 – *See Vol. A*

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Transformers, Microminiature-5600 – *See Vol. A*

Transformers, Microphone-5600 – *See Vol. A*

Transformers, Mixing-5600 – *See Vol. A*

Transformers, Modulation-5600 – *See Vol. A*

Transformers, Output-5600 – *See Vol. A*

Transformers, Plate-5600 – *See Vol. A*

Transformers, Plug-in-5600 – *See Vol. A*

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Transformers, Servo-5600 – *See Vol. A*

Transformers, Split Bobbin-5600 – *See Vol. A*

Transformers, Step Down, Step Up – See Transformers, Power (Vol. A)

Transformers, Surface Mount-5600 – *See Vol. A*

Transformers, Switching, Power-5600 – *See Vol. A*

Transformers, Synchro Control-5600 – *See Vol. A*

Transformers, Telephone Coupling-5600 – *See Vol. A*

Transformers, Toroidal-5600 – *See Vol. A*

Transformers, Transistor-5600 – *See Vol. A*

Transformers, Trigger – See Transformers, Pulse (Vol. A)

Transformers, Variable-5600 – *See Vol. A*

Transformers, Variable, Motorized-5600 – *See Vol. A*

Transformers, Voltage Dividing-5600 – *See Vol. A*

Transformers, Voltage Regulating-Also See Regulators & Stabilizers, Voltage-5600 – *See Vol. A*

Transformers, Wall Plug-in – See Power Supplies, Plug-in (Vol. D)

Transformers, Wideband-5600 – *See Vol. A*

Transformers (MIL), Audio, Power, RF-2440 – *See Vol. B*

Transformers (MIL), Pulse & Variable-2440 – *See Vol. B*

Transistor Arrays-4800 – *See Vol. A*

Transistor Arrays, Surface Mount-4800 – *See Vol. A*

Transistor, Diode, Thyristor Heat Dissipators – See Heat Sinks, Transistor (Vol. C)

Transistors, Bipolar-Also See Transistors, Silicon-4800 — *See Vol. A*

Transistors, Bipolar, Surface Mount-4800 — *See Vol. A*

Transistors, Chip, Unpackaged-4800 — *See Vol. A*

Transistors, Darlington-4800 — *See Vol. A*

Transistors, Darlington, Surface Mount-4800 — *See Vol. A*

Transistors, Dual-4800 — *See Vol. A*

Transistors, Field Effect-4800 — *See Vol. A*

Transistors, Field Effect, Surface Mount-4800 — *See Vol. A*

Transistors, Germanium-4800 — *See Vol. A*

Transistors, Low Noise, GaAs, FETs - Also See Transistors, Microwave-4800 — *See Vol. A*

Transistors, Microwave-4800 — *See Vol. A*

Transistors, NPN, Surface Mount-4800 — *See Vol. A*

Transistors, Photo (Incl. Arrays)-3700 — *See Vol. B*

Transistors, PNP, Surface Mount-4800 — *See Vol. A*

Transistors, Power-4800 — *See Vol. A*

Transistors, Power, Bipolar-4800 — *See Vol. A*

Transistors, Power, Bipolar, Surface Mount-4800 — *See Vol. A*

Transistors, Power, FET-4800 — *See Vol. A*

Transistors, Power, Field Effect, Surface Mount-4800 — *See Vol. A*

Transistors, Pressure Sensitive-4800 — *See Vol. A*

Transistors, RF-4800 — *See Vol. A*

Transistors, RF, Surface Mount-4800 — *See Vol. A*

Transistors, Silicon-4800 — *See Vol. A*

Transistors, Switching-4800 — *See Vol. A*

Transistors, Switching, Surface Mount-4800 — *See Vol. A*

Transistors, Unijunction-4800 — *See Vol. A*

Transistors, Unijunction, Surface Mount-4800 — *See Vol. A*

Transistors (MIL)-2440 — *See Vol. B*

Translators, Data-2325 — *See Vol. D*

Translators, Frequency Band-2750 — *See Vol. A*

Translators, Time Code-2000 — *See Vol. D*

Transmission Line, Data — See Cable, Data Transmission (Vol. C)

Transmission Line, Wire & Cable — See Cable, Transmission Line (Vol. C)

Transmission Lines (MIL), RF-2440 — *See Vol. B*

Transmission Systems, Data-2000 — *See Vol. D*

Transmitters, Fiber Optic-2475 — *See Vol. B*

Transmitters, Fixed Frequency-1900 — *See Vol. D*

Transmitters, Infrared remote control transmitters for satellite T.V. receivers-1900 — *See Vol. D*

Transmitters, Laser-3700 — *See Vol. B*

Transmitters, Position-1900 — *See Vol. D*

Transmitters, Process Control (Temperature, Pressure, Flow, etc.)-5500 — *See Vol. B*

Transmitters, Radar — See Radar System Components (Vol. A)

Transmitters, Telemetry-1900 — *See Vol. D*

Transmitters, Tone-1900 — *See Vol. D*

Transmitters (MIL)-2440 — *See Vol. B*

Transponders-1900 — *See Vol. D*

Transports, Tape (all kinds)-2000 — *See Vol. D*

TRIACs-4800 — *See Vol. A*

Triggers, SCR — See Controls, SCR (Vol. D)

Trimmers, Capacitor — See Capacitors, Variable, Padders & Trimmers (Vol. A)

Trimmers, Potentiometer — See Potentiometers, Trimmer (Vol. A)

Trimmers, Surface Mount, Capacitor-1500 — *See Vol. A*

Trimmers, Surface Mount, Potentiometer-4750 — *See Vol. A*

Tube Heat Dissipators-2600

† IERC, Burbank, CA 91502 213-849-2481

Tubes, Ballast — See Resistors, Ballast (Vol. A)

Tubes, Cathode Ray, General Purpose-2450 — *See Vol. B*

Tubes, Cathode Ray, Special Purpose-2450 — *See Vol. B*

Tubes, Counting-2200 — *See Vol. D*

Tubes, Flash-3700 — *See Vol. B*

Tubes, Ignitron-2200 — *See Vol. D*

Tubes, Image Converter-2450 — *See Vol. B*

Tubes, Indicator — See Tubes, Readout (Vol. B)

Tubes, Magnetron — See Tubes, Microwave (Vol. A)

Tubes, Microwave-3400 — *See Vol. D*

Tubes, Photomultiplier-3700 — *See Vol. B*

Tubes, Readout (CRT, Cold-Cathode, Vacuum Fluorescent, Incandescent, etc.)-2450 — *See Vol. B*

Tubes, Strobe — See Lamps, Stroboscopic Source (Vol. B)

Tubes, TV Camera Pickup-3700 — *See Vol. B*

Tubes, Transmitting-1900 — *See Vol. D*

Tubes, X-ray-2200 — *See Vol. D*

Tubes (MIL), Indicator & Pickup-2440 — *See Vol. B*

Tubes (MIL), Microwave-2440 — *See Vol. B*

Tubes (MIL), Power & Gas, Planar-2440 — *See Vol. B*

Tubes (MIL), Receiving, & Tube Shields-2440 — *See Vol. B*

Tubing, Ceramic-2500

Alberox Corporation, New Bedford, MA 02745 508-995-1725
Aremco Products, Inc., Ossining, NY 10562 914-762-0685
† The Carborundum Company, Electronic Ceramics, Niagara Falls, NY 14302 716-278-2000
Coors Ceramics Co., Golden, CO 80401 303-278-4000
Omega Engineering, Stamford, CT 06907 800-826-6342
† Quartzite Processing, Inc., Malden, MA 02148 617-322-3611
Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
† Saphikon, Inc., Milford, NH 03055 603-673-5831

Tubing, Fiberglass-2800

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1761
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1956
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§† Markel Corp., Norristown, PA 19404 215-272-8960
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140

Tubing, Glass-2500

§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§† Corning Glass Works, Materials Business, Corning, NY 14831 607-974-9000
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
Garner Glass Co., Claremont, CA 91711 714-624-5071
GTI/Electronics Div., Hadley, PA 16130 412-253-3161

Tubing, Heat Shrinkable-Also See Caps, Forms & Tapes, Heat Shrinkable-2500

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1761
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1828-1829
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1847
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848-1849
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 .... C•1873

§† Markel Corp., Norristown, PA 19404, 215-272-8960 ..... C•1698
§ Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025, 415-361-3860 ..... C•1700
§† Remtek Corporation, Fremont, CA 94538, 415-490-3999 ..... C•1701
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ..... C•1957-1959
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Antex Division, Marblehead, MA 01945 617-631-7100
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§† Chomerics, Inc.:W.R. Grace & Co., Woburn, MA 01888 617-935-4850
§† Conexco International, Jamaica, NY 11432 718-523-4100
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Shin-Etsu Polymer America, Inc., Union City, CA 94587 415-475-9000
Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
Topflight, York, PA 17404 ..... 717-843-9901;800-233-9386
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§† Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Tubing, Metal-2500

† ITT-Higbie Mfg., Rochester, MI 48063 313-651-5300
§† Micro-Coax Components, Inc., a UTI Company, Collegeville, PA 19426 .. 215-489-3700
† NGK Berylco, NGK Metals Corporation, Reading, PA 19612-3367 215-921-5000
§ Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Omega Engineering, Stamford, CT 06907 800-826-6342
Parker Hannifin Corp., Cleveland, OH 44112-1290 216-531-3000
† Wall, A. T., Co., Warwick, RI 02886 401-739-0740

Tubing, Paper-2500

Erdie Paper Tube Company, Lorain, OH 44052 216-288-0166

Tubing, Plastic-Also See Tubing, Spaghetti-2500

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1762
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1828-1829
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... C•1847
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
Acme Model Engineering Co., Ridgefield, NJ 07657 201-943-7650
§† Antex Division, Marblehead, MA 01945 617-631-7100
† Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§ Bivar, Inc., Irvine, CA 92718 714-951-8808
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
Gasket International Inc., Bloomfield, NJ 07003 201-338-6814
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
† Glenair Inc., Glendale, CA 91201-2497 818-247-6000
† Homalite, Inc., Wilmington, DE 19804 302-652-3686
§ ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
ITT-Higbie Mfg., Rochester, MI 48063 313-651-5300
§† Markel Corp., Norristown, PA 19404 215-272-8960
Moxness Products, Inc., Versa Technologies, Racine, WI 53405 ..... 414-554-5050; 800-558-5706
§† Norelcom Inds., Farmingdale, NY 11735 516-249-7245
Norgren, Littleton, CO 80120-1663 303-794-2611
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Parker Seal Grp., Irvine, CALIFORNIA 92715 714-851-3763
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
§ Polymer Corp., Reading, PA 19605 215-320-6600
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
† Spruce Pine Mica Co., Spruce Pine, NC 28777 704-765-4241
† Stevens Products, Inc., E. Orange, NJ 07019 201-672-2140
† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Tubing, Spaghetti-2500

§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1829
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
† Phoenix Wire, Inc., S. Hero, VT 05486, 802-372-4561 ..... C•1915
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Applied Plastics Technology, Bristol, RI 02809 401-253-0200
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
† Cadillac Plastic & Chem. Co. Div. of M.A. Hanna, Troy, MI 48083 313-583-1200
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§† Markel Corp., Norristown, PA 19404 215-272-8960
§ Norelcom Inds., Farmingdale, NY 11735 516-249-7245
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842

Tubing, Spiral Wrap-2500

§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1829
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
† Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
AMP, Harrisburg, PA 17105 717-564-0100
§† Antex Division, Marblehead, MA 01945 617-631-7100
§ Applied Plastics Technology, Bristol, RI 02809 401-253-0200
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Dayco Products, Inc., Dayton, OH 45401-1004 513-226-5923
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
Erdie Paper Tube Company, Lorain, OH 44052 216-288-0166
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§† Markel Corp., Norristown, PA 19404 215-272-8960
† Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
§ Richco Plastic Co., Chicago, IL 60680 312-539-4060
† Spira Manufacturing Corp., North Hollywood, CA 91605 818-764-8222
Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842

Tubing, Waveguide-3450 — *See Vol. A*

Tubing, Zipper-2500

Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§ Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Tuners, AM/FM-1300 — *See Vol. D*

Tuners, Microwave-3450 — *See Vol. A*

Tuning Forks-2300 — *See Vol. A*

Tweezers, Manual & Vacuum-5400

Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477
† Air-Vac Engrg., Milford, CT 06460 203-874-2541
§† Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ General Hardware Mfg., New York, NY 10013 212-431-6100
§ Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Orbit Industries, Countis Industries, Carson City, NV 89706 702-882-6123
§ Plato Products, Inc., Glendora, CA 91740 800-423-4510
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990

Ultraviolet Inspection Lighting-Also See Microscopes, Ultraviolet-4100 — *See Vol. D*

Urea Formaldehyde — See Plastic Raw Materials (Vol. C)

Valve Position Indicators/Transmitters-5500 — *See Vol. B*

Valve Positioners & Actuators-4750 — *See Vol. A*

Valves, Solenoid-4550 — *See Vol. B*

Valves, Vacuum-4100 — *See Vol. D*

Varactors — See Diodes, Varactor (Vol. A)

Varistors — See Resistors, Voltage Sensitive (Vol. A)

VCXO — See Oscillators, Voltage Controlled Crystal

VHF Equipment — See Generators (Vol. D), Receivers (Vol. D), etc.

Vibration Surveys — See Services, Vibration Surveys (Vol. D)

Vibration Test Systems — See Testers, Vibration (Vol. D)

Vibrators-4050 — *See Vol. D*

Video Components & Equipment — See Specific Component: Amplifiers (Vol. D), Cameras (Vol. D), Networks (Vol. D), etc.

Viewers (MIL)-2440 — *See Vol. B*

Viewing Hoods, Cathode Ray Tube-2975 — *See Vol. D*

Vinyl Compounds — See Plastic Raw Materials (Vol. C)

Vises-5400

Contact East, N. Andover, MA 01845 508-682-2000
§ PanaVise Prods., Long Beach, CA 90806 213-595-7621

Visual Micro Inspection Systems-2900 — *See Vol. D*

VLF Equipment — See Receivers (Vol. D), Transmitters (Vol. D), etc.

VME Bus Cards-2025 — *See Vol. D*

Voice Recognition Equipment — See Recognition Equipment, Speech (Vol. D)

Voltage Selector — See Adaptors, US to European Power (Vol. C)

Voltage Sources-4000 — *See Vol. D*

Voltmeter, Electrostatic-2900 — *See Vol. D*

Wafer Fabrication, Semiconductor — See Semiconductor Wafer Fabrication (Vol. D)

Wall Plates — See Boxes, Junction, Outlet & Wall Plates (Vol. C)

Warning Systems, Lightning-4300 — *See Vol. B*

Warning Systems (MIL)-2440 — *See Vol. B*

Washers, Lock-2500

§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
† Morris, J. I., Co., Southbridge, MA 01550 508-764-4394
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121

Washers, Plain-2500

All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1150
§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312
§ LEMO U.S.A., Inc., Santa Rosa, CA 95406, 707-578-8811, 800-444-LEMO (5366) ..... C•1401-1402
† Unicorp, Orange, NJ 07050, 201-674-1700 ..... C•1628-1629
§† Berg, W. M., Inc., East Rockaway, NY 11518 516-599-5010
Boker's, Inc., Minneapolis, MN 55406-1937 612-729-9365
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† Cut Craft, Inc., Ft. Worth, TX 76102 817-332-6151
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
ELMA Electronic Inc., Fremont, CA 94538 415-656-3400
Forma Scientific, Inc., Marietta, OH 45750 614-373-4763
Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
† Micro Plastics Inc., Flippin, AR 72634 501-453-2261
† Morris, J. I., Co., Southbridge, MA 01550 508-764-4394
PIC Design, Remington Technologies, Inc., Middlebury, CT 06762 203-758-8272
Seastrom Manufacturing Co., Inc., Glendale, CA 91201 213-245-9121

Washers, Shoulder-2500

§ Concord Electronics Corporation, New York, NY 10012, 1-212-777-6571 ..... C•1312
Unicorp, Orange, NJ 07050, 201-674-1700 ..... C•1628-1629
Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§† Kam Components, Inc., Nesconset, NY 11767 516-585-0666
§† Keystone Electronics Corp., Astoria, NY 11105-2017 718-956-8900
§† Teknational Inds., Inc., Rochester, NY 14620-1103 716-232-1291

Waveguide-Coax Adapters-3450 — *See Vol. A*

Waveguides-3450 — *See Vol. A*

Waveguides (MIL)-2440 — *See Vol. B*

Wave Soldering Equipment — See Soldering Equip, Printed Circuit (Vol. C)

Wave Traps — See Filters, Antenna (Vol. A), Filters, Microwave (Vol. A), etc.

Welding Equipment & Accessories (Excl. Equipment for Semiconductor Devices)-5400

§ Apollo Lasers, Inc., Chatsworth, CA 91311 818-407-3000
§ BEA electro-optics, inc., Des Plaines, IL 60016 708-298-1420
† Coherent General, Inc., Sturbridge, MA 01566 508-347-2681
† Coherent, Inc., Palo Alto, CA 94303 415-493-2111
Dukane Corp., Communications Sys. Div., St. Charles, IL 60174-9984 312-584-2300
† Ewald Instruments Corp., Kent, CT 06757 203-927-3278
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
Henes Products, Phoenix, AZ 85034 602-275-4126
Hughes Aircraft Co., Industrial Products Division, Carlsbad, CA 92009 619-931-3000
§ L & R Mfg. Co., Kearny, NJ 07032 201-991-5330
§ Solder Absorbing Technology (SAT), A Spirig Co., Springfield, MA 01108 800-628-8862
§† Sonobond Ultrasonics Inc., Inductotherm Industries, West Chester, PA 19380 ..... 215-696-4710;800-323-1269
Venable Industries, Inc., Torrance, CA 90505 213-539-2522

Welding Machines, Laser-4100 — *See Vol. D*

White Noise Generator Modules — See Generators, White Noise (Vol.), Diodes, Noise

White Printers-4200

§ Teledyne Rotolite, Owen, WI 54460 800-524-0105

Windows, Sapphire-2500

† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
Ceramaseal, New Lebanon, NY 12125 518-794-7800
† Saphikon, Inc., Milford, NH 03055 603-673-5831
Swiss Jewel Company, Philadelphia, PA 19106 ..... 215-925-2867;800-922-0118
† Union Carbide Corporation, Industrial Chemicals Div., Crystal Products Dept., San Diego, CA 92123 619-279-4500

Windows, Shielded — See Shields, RF (Vol. C)

Wire & Cable Ties-2500

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1760,1762
§† All-States, Inc., Chicago, IL 60640, 312-728-0525 ..... C•1148-1150
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1853
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1861-1862
§† Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 ..... C•1863
ITW Fastex Distributor Business, Wood Dale, IL 60191-1150, 312-350-8200 ..... C•1387
3M-Electronic Products Division, Austin, TX 78769-2963, 512-984-1800 ..... C•1438
§ Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945, 617-631-7100 ..... C•1874
§† Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1908
† Accurate Electronics, Elyria, OH 44036 216-366-6330
§ Amlan, Inc., Stamford, CT 06903 203-322-1913
§ AMP, Harrisburg, PA 17105 717-564-0100
§† Amrad & Transcon Mfg. Co., Div. of D.J. Assocs., Inc., Fort Smith, AR 72903-7045 501-452-3987
Antex Division, Marblehead, MA 01945 617-631-7100
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† DEK Inc., St. Charles, IL 60174 312-377-2575
§† Dennison Mfg. Co., Framingham, MA 01701 617-879-0511
§ Dynacast, Div. Coats & Clark Inc., Yorktown Heights, NY 10598 914-245-0060
§ Electronic Resources Inc., Sunnyvale, CA 94089 408-745-1420
§ Elite Electronics, Inc., Plano, TX 75074 ..... 214-881-0026;800-553-4376
§ Fastex, Illinois Tool Works, Des Plaines, IL 60016 312-299-2222
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
Hanscom, H. F., Co., Inc., Providence, RI 02905 401-941-1455
§† ICO-RALLY Corporation, Palo Alto, CA 94303 415-856-9900
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
† Independent Cable, Inc., Hudson, MA 01749 617-562-9913
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§† Lyn-Tron, Inc., Burbank, CA 91505 ..... 213-849-6211;800-423-2734
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
† Micro Plastics Inc., Flippin, AR 72634 501-453-2261
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§† Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
§ NTE Electronics, Inc., Bloomfield, NJ 07003 201-748-5089
† Nylon Molding Corp., Monrovia, CA 91016 818-358-2305
§† Pioneer Components, Brooklyn, NY 11234 718-444-3880
§† Richco Plastic Co., Chicago, IL 60680 312-539-4060
Switches Unlimited, Inc., Woodside, NY 11377 ..... 718-478-5000;800-221-0487
§ Syracuse Elctrns. Div. of Pass & Seymour, Syracuse, NY 13221 315-488-4911
§† Syracuse Electronics, Pass & Seymour, Inc., Syracuse, NY 13221 315-468-6211
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Vaco Products, Chicago, IL 60645 312-677-9500
Whitso, Schiller Pk, IL 60176 312-678-5200
§† Zeus Indl. Prods. Inc., Raritan, NJ 08869 ..... 201-526-0800;800-526-3842

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Wire, Antenna (All Types)-6000

§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... **C•1878**
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... **C•1882**
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§† Carolina Steel & Wire, Lexington, SC 29072-0829 803-359-5501
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ EPD Electronics, Inc., Gardena, CA 90247 213-515-4996
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
International Mircoelectronics, Arlington, TX 76003 817-561-2244
§ JSC Wire & Cable, Wayne, NJ 07474 ..... 201-694-6200;1-800-572-9473
Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ Sparkomatic, Milford, PA 18337 717-296-6444
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121

Wire, Bare, Copper-6000

§ **Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1** ..... **C•1768**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
§ **Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000** .... **C•1873**
† **Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473** ..... **C•1878**
§† **MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553** ..... **C•1882**
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886**
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
AT&T Microelectronics, Allentown, PA 18103 ..... 1-800-372-2447;In Can.: 1-800-553-2448
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§† Phelps Dodge Magnet Wire, Ft. Wayne, IN 46801 219-458-4444
† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
§ Piher International Corp., Mt. Prospect, IL 60056 ..... 312-390-6680;800-323-6693
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
† Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
§ Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Wilkinson, Westlake Village, CA 91359 ..... 818-889-0050;800-822-4653

Wire, Bare, Nickel-6000

§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** ..... **C•1848-1849**
† **Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473** ..... **C•1878**
§† **MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553** ..... **C•1882**
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§ Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
† Magnetics, Spang & Co., Butler, PA 16003-0391 412-282-8282
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Piher International Corp., Mt. Prospect, IL 60056 ..... 312-390-6680;800-323-6693
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
† Wilkinson, Westlake Village, CA 91359 ..... 818-889-0050;800-822-4653

Wire, Bare, Nickel-Chrome-6000

§ **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
† **Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473** ..... **C•1878**
§† **MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553** ..... **C•1882**
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
§ Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
Materials Research Corporation, Orangeburg, NY 10962 914-359-4200
Omega Engineering, Stamford, CT 06907 800-826-6342
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353

Wire, Bonding-6000

MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... **C•1882**
Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353

Wire, Braid (Excluding Shielding)-6000

§ **Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1** ..... **C•1768**
§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... **C•1820,1827**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
† **Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473** ..... **C•1878**
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Electro Weave, Worcester, MA 01604 617-752-8932
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† GSI Corp., Timonium, MD 21093 301-252-1768
† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
† National-Standard Co., Niles, MI 49120 616-683-8100
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Pyrocom Co., Seattle, WA 98133 206-365-3535
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

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Wire, Ceramic Insulated-6000

§ **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... **C•1907**
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Ceramawire, Cranford, NJ 07016 201-276-1170
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
† DELTA M Corporation, Oak Ridge, TN 37830 615-483-1569
Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800

Wire, Clad (All Types)-6000

§† **Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886** ..... **C•1821**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
† **Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473** ..... **C•1878**
Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... **C•1458**
§† **MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553** ..... **C•1882,1884-1885**
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... **C•1907**
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
Mouser Electronics, Mansfield, TX 76063 800-346-6873
† National-Standard Co., Niles, MI 49120 616-683-8100
† Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
Texas Instrs., Inc., Dallas, TX 75380 ..... 800-232-3200 (ext 700)
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800

Wire Cutting & Stripping — See Services, Wire Cutting & Stripping (Vol. D)

Wire, Enamel Insulated — See Wire, Hookup (All Types) (Vol. C)

Wire, Fiberglass Insulated — See Wire, Glass Insulated (Vol. C)

Wire, Flame Retardant-6000

§ **Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1** ..... **C•1768**
§† **Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400** .. **C•1848**
§† **Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357** ..... **B•1019, C•1865**
Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... **C•1878**
§† **MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553** ..... **C•1882**

National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886**
Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... **C•1519,1922**
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
† Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 416-335-2343
† Electro Weave, Worcester, MA 01604 617-752-8932
§† FL Surprenant Div., Clinton, MA 01510 617-368-1401
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Leviton Telcom, Leviton Manufacturing, Bothell, WA 98021-4416 ..... 206-485-4288; 206-486-2222
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Markel Corp., Norristown, PA 19404 215-272-8960
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400

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Wire, Glass Insulated-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... **C•1768**
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. **C•1848**
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... **C•1878**
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... **C•1882**
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... **C•1907**
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
Galileo Electro-Optics Corp., Sturbridge, MA 01566 508-347-9191
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872

Wire, Gold-2500

MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... **C•1882**
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 ..... **D•2241**
GTE Products Corp., Williamsport, PA 17701 717-326-6591
Molecu-Wire, Farmingdale, NJ 07727 201-938-9473
Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353

Wire, Guy-6000

§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ Carolina Steel & Wire, Lexington, SC 29072-0829 803-359-5501
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Lance Industries, Sylmar, CA 91342-0156 818-367-1811
Ren Electronics Corporation, C.C.G., An Insico Co., S. Hadley, MA 01075 413-536-1800
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700

Wire, Heater – See Cable, Heater (Vol. C)

Wire, High Temperature (Over 125 + C)-6000

§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... **C•1768**
Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... **C•1303**
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... **C•1846**
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. **C•1848**
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... **B•1019, C•1865**
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... **C•1878**
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... **C•1882**
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886**
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... **C•1907**
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... **C•1519,1922**
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
Acme Elec. Heating Corp., Hialeah, FL 33013 305-685-8326
Alden Products Co., Brockton, MA 02403 508-583-0160
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† Atomergic Chemetals Corp., Farmingdale, NY 11735-1527 516-694-9000
† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 714-863-0300
§ Baron Wire & Cable, Skokie, IL 60076 312-677-5000
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 203-423-6321
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§† Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 416-424-5000
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
Ceramawire, Cranford, NJ 07016 201-276-1170
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
§† Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
§† Gordon Co.:Watlow, Richmond, IL 60071 815-678-2211
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
† National-Standard Co., Niles, MI 49120 616-683-8100
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
† Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
† Plastoid Corporation, Hamburg, NJ 07419 201-827-7141
Radix Wire Co., Cleveland, OH 44132 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Remee Products Corp., Florida, NY 10921 914-651-4431
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§† Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
§† Wilco Wire & Cable Co., Inc., San Jose, CA 95133 408-926-8880
† Wilkinson, Westlake Village, CA 91359 ..... 818-889-0050;800-822-4653

Wire, High Voltage (1000 Volts & Over)-6000

Caton Connector Corp., Kingston, MA 02364, 617-585-4315 ..... **C•1304**
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ..... **C•1846**
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. **C•1848**
§ Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... **B•1019, C•1865**
Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... **C•1878**
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... **C•1882**
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... **C•1886**
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 ..... **C•1518**
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
† Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000

§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 ... 714-863-0300
§† Baron Wire & Cable, Skokie, IL 60076 ... 312-677-5000
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ... 317-983-5200; 800-BELDEN-1
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 ... 508-822-6600
§† Brim Electronics, Fair Lawn, NJ 07410 ... 201-796-2886
† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 ... 203-456-8000
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 ... 416-424-5000
Chester Cable, Alcatel, N. A., Chester, NY 10918 ... 914-469-2141
§ Custom Cable Corp., Westbury, NY 11590 ... 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 ... 312-473-4990
† Electro Weave, Worcester, MA 01604 ... 617-752-8932
Galileo Electro-Optics Corp., Sturbridge, MA 01566 ... 508-347-9191
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 ... 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 ... 302-738-4880
§† Judd Wire Inc., San Marcos, CA 92069 ... 619-744-7720
§† Markel Corp., Norristown, PA 19404 ... 215-272-8960
Okonite Co., Ramsey, NJ 07446 ... 201-825-0300
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 ... 609-235-6700
Radix Wire Co., Cleveland, OH 44132 ... 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 ... 415-361-3860
† Storm Products Co., Hinsdale, IL 60521 ... 312-323-9121
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 ... 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 ... 914-737-5600
† United Wire & Cable Corp., Worcester, MA 01604 ... 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 ... 213-870-9933
Weico Wire & Cable, Edgewood, NY 11716 ... 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 ... 805-257-2400

Wire, Hookup (All Types)-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ... C•1762
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 ... C•1763
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ... C•1821
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ... C•1848
§ E-Z Hook, Tektest Inc., Arcadia, CA 91006, 818-446-6175 ... C•1351
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ... C•1865
§ Manhattan Electric Cable Corporation, Rye, NY 10580, 914-967-8000 ... C•1873
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ... C•1886-1888
† Phoenix Wire, Inc., S. Hero, VT 05486, 802-372-4561 ... C•1915
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ... C•1477
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ... C•1926-1931
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 ... 1-401-769-1600
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 ... 201-925-8000
§† American Wire & Electronics, Costa Mesa, CA 92626 ... 714-957-6905
† Barcel Wire & Cable Corp., Electronics Div., Irvine, CA 92714 ... 714-863-0300
§† Baron Wire & Cable, Skokie, IL 60076 ... 312-677-5000
§† Berk-Tek Inc., New Holland, PA 17557 ... 717-354-6200
BIW Cable Systems, Inc., N. Dighton, MA 02764 ... 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 ... 203-423-6321
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 ... 203-456-8000
§† Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 ... 416-424-5000
Carol Cable Co. Inc., Pawtucket, RI 02862 ... 401-724-9605
† Chester Cable, Alcatel, N. A., Chester, NY 10918 ... 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 ... 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 ... 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 ... 818-882-8311
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 ... 312-473-4990
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 ... 416-335-2343
† Electro Weave, Worcester, MA 01604 ... 617-752-8932
§† Gavitt Wire & Cable, Brookfield, MA 01506 ... 508-867-6476
§ GC-Thorsen, Rockford, IL 61105-1209 ... 815-968-9661
† General Wire Products, Inc., Worcester, MA 01604 ... 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 ... 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 ... 302-738-4880
§ Ideal Industries, Sycamore, IL 60178 ... 815-895-5181
Jonard Industries Corp., Tuckahoe, NY 10707 ... 914-793-0700
§ JSC Wire & Cable, Wayne, NJ 07474 ... 201-694-6200;1-800-572-9473
§† Judd Wire Inc., San Marcos, CA 92069 ... 619-744-7720
§† Lynn Electronics, Feasterville, PA 19047 ... 215-677-6700;800-523-6075
§† Markel Corp., Norristown, PA 19404 ... 215-272-8960
Molecu-Wire, Farmingdale, NJ 07727 ... 201-938-9473
§ OK Industries, Inc., Yonkers, NY 10701 ... 914-969-6800
§† Olympic Wire & Cable, Fairfield, NJ 07006 ... 201-227-7996
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 ... 609-235-6700
Radix Wire Co., Cleveland, OH 44132 ... 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 ... 415-361-3860
§ Remee Products Corp., Florida, NY 10921 ... 914-651-4431
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 ... 914-429-3103
Rowe Industries, Inc., Toledo, OH 43612 ... 419-729-9761
§ Shokai Far East, Ltd., Hartsdale, NY 10530 ... 914-681-0700
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 ... 312-323-9121
§† Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 ... 919-236-4311
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 ... 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 ... 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 ... 201-843-5800
† United Wire & Cable Corp., Worcester, MA 01604 ... 617-757-3872
Vector Electronic Co., Inc., Sylmar, CA 91342 ... 818-365-9661
† Victor Wire & Cable Corp., Los Angeles, CA 90016 ... 213-870-9933
§† Whitmor Wire & Cable, Valencia, CA 91355 ... 805-257-2400

Wire, Irradiated-6000

§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412, 312-455-8830 ... C•1846
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ... C•1848
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ... B•1019, C•1865
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 ... C•1928
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 ... 914-962-2253
Alden Products Co., Brockton, MA 02403 ... 508-583-0160
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 ... 201-925-8000
BIW Cable Systems, Inc., N. Dighton, MA 02764 ... 508-822-6600
† Brand Dielectrics, Inc., N. Windham, CT 06256 ... 203-423-6321
Brim Electronics, Fair Lawn, NJ 07410 ... 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 ... 203-456-8000
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ... 312-459-1000;800-323-0198
Delta Wire & Cable Co., North Chicago, IL 60064 ... 312-473-4990
§ Dilwol, Burlington, Ontario, CANADA L7N 3G2 ... 416-335-2343
† Electro Weave, Worcester, MA 01604 ... 617-752-8932
§† FL Surprenant Div., Clinton, MA 01510 ... 617-368-1401
§† Judd Wire Inc., San Marcos, CA 92069 ... 619-744-7720
§ Manhattan Electric Cable Corporation, Rye, NY 10580 ... 914-967-8000
§ Olympic Wire & Cable, Fairfield, NJ 07006 ... 201-227-7996
Permaluster, Inc., Burbank, CA 91504 ... 213-849-4543;213-849-6454
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 ... 415-361-3860
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ... 213-609-1811; 800-447-0006/821-527
Storm Products Co., Hinsdale, IL 60521 ... 312-323-9121
§† Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 ... 919-236-4311
† United Wire & Cable Corp., Worcester, MA 01604 ... 617-757-3872

Wire, Lead-in & Ground-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ... C•1820,1822,1827
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ... C•1848
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 ... 201-925-8000
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Baron Wire & Cable, Skokie, IL 60076 ... 312-677-5000
BIW Cable Systems, Inc., N. Dighton, MA 02764 ... 508-822-6600
§† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 ... 203-456-8000
Carol Cable Co. Inc., Pawtucket, RI 02862 ... 401-724-9605
Chester Cable, Alcatel, N. A., Chester, NY 10918 ... 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 ... 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 ... 818-882-8311
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ... 312-459-1000;800-323-0198
† Dilwol, Burlington, Ontario, CANADA L7N 3G2 ... 416-335-2343
† Electro Weave, Worcester, MA 01604 ... 617-752-8932
§ GC-Thorsen, Rockford, IL 61105-1209 ... 815-968-9661
§ Lance Industries, Sylmar, CA 91342-0156 ... 818-367-1811
§ Manhattan Electric Cable Corporation, Rye, NY 10580 ... 914-967-8000
§ Markel Corp., Norristown, PA 19404 ... 215-272-8960
Rowe Industries, Inc., Toledo, OH 43612 ... 419-729-9761
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ... 213-609-1811; 800-447-0006/821-527
§ Teledyne Thermatics, Teledyne Inds., Inc., Elm City, NC 27822 ... 919-236-4311
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 ... 914-737-5600
† United Wire & Cable Corp., Worcester, MA 01604 ... 617-757-3872
Weico Wire & Cable, Edgewood, NY 11716 ... 516-254-2970

Wire, Litz-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ... C•1768
† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ... C•1848
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ... C•1882
§† Brim Electronics, Fair Lawn, NJ 07410 ... 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 ... 203-456-8000
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 ... 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 ... 818-882-8311
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ... 312-459-1000;800-323-0198
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ... 213-609-1811; 800-447-0006/821-527

Wire, Magnet-6000

§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ... C•1848
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ... C•1878
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ... C•1882-1885
† Phoenix Wire, Inc., S. Hero, VT 05486, 802-372-4561 ... C•1915
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 ... 914-962-2253
Acme Elec. Heating Corp., Hialeah, FL 33013 ... 305-685-8326
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ... 317-983-5200; 800-BELDEN-1
§† Brim Electronics, Fair Lawn, NJ 07410 ... 201-796-2886
§ Canada Wire and Cable Limited, Don Mills, Ontario, CANADA M3C 3J4 ... 416-424-5000
Ceramawire, Cranford, NJ 07016 ... 201-276-1170

§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
§† Electromech, Inc., Kearny, NJ 07032 201-997-0950
Permaluster, Inc., Burbank, CA 91504 .... 213-849-4543;213-849-6454
§† Phelps Dodge Magnet Wire, Ft. Wayne, IN 46801 219-458-4444
§ Shokai Far East, Ltd., Hartsdale, NY 10530 914-681-0700
Texas Instruments, Connector System, Attleboro, MA 02703 .... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800

Wire Markers (All Types)-Also See Strips Marker & Fanning-6000

Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
§† Datak Corp., N. Bergen, NJ 07047, 201-863-7667 .... C•1726
† GSI Corp., Timonium, MD 21093, 301-252-1768 .... C•1860-1862
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 .... C•1908-1909
§† Remtek Corporation, Fremont, CA 94538, 415-490-3999 .... C•1701
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§† Brady, W. H., Co., Indl. Prods. Div., Milwaukee, WI 53201 414-351-6630
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Caristrap International, Inc., Chomedey, Lavac, QUEBEC, CANADA H7SIN8 514-667-4700
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
† Electro Weave, Worcester, MA 01604 617-752-8932
Eubanks Engineering, Monrovia, CA 91016 818-357-7011
§† Excel Specialty Corp., Chicago, IL 60660 312-262-4781
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
§† Markel Corp., Norristown, PA 19404 215-272-8960
§ Newman, M. M., Corp., Heli-Tube Div., Marblehead, MA 01945 617-631-7100
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
§ Syracuse Elctrns. Div. of Pass & Seymour, Syracuse, NY 13221 315-488-4911
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
§ Weidmuller, Inc., Richmond, VA 23236 804-794-2877
Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Wire, Multiconductor – See Cable, Multiconductor (Vol. C)

Wire Nuts-2500

Alden Products Co., Brockton, MA 02403, 508-583-0160 .... C•1144
§ Heyco Molded Products, Inc., Kenilworth, NJ 07033, 201-245-0033;800-526-4182 .... C•1863
Autosplice, Inc., Woodside, NY 11377 718-429-0500
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Switches Unlimited, Inc., Woodside, NY 11377 .... 718-478-5000;800-221-0487
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Vaco Products, Chicago, IL 60645 312-677-9500

Wire, Plastic Insulated – See Wire, Hookup (All Types) (Vol. C)

Wire, Plated (All Types)-6000

§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 .... C•1878
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 .... C•1882,1884-1885
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
† Handy & Harman Elctrn. Matls. Corp., N. Attleboro, MA 02761-1031 508-695-1401
† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
Ken-Tron Mfg., Inc., Owensboro, KY 42301 502-684-0431
† National-Standard Co., Niles, MI 49120 616-683-8100
Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353

Wire, Radiation Resistant-6000

§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 .... C•1820-1821
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 .... B•1019, C•1865
Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 .... C•1878
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 .... C•1882
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Ceramawire, Cranford, NJ 07016 201-276-1170
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
Okonite Co., Ramsey, NJ 07446 201-825-0300
Permaluster, Inc., Burbank, CA 91504 .... 213-849-4543;213-849-6454
† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 .... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400

Wire, Resistance-6000

§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 .... C•1878
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 .... C•1882
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 .... C•1886
The J. M. Ney Company, Bloomfield, CT 06002, 203-242-2281 .... D•2241
Acme Elec. Heating Corp., Hialeah, FL 33013 305-685-8326
§ Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
§ Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
§† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
§ Specialty Cable Corporation, Wallingford, CT 06492 .... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 .... 213-609-1811; 800-447-0006/821-527
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600

Wire, Semiconductor Lead-6000

§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 .... C•1878
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 .... C•1882
† Art Wire/Doduco, Cedar Knolls, NJ 07927 201-267-2000
§† Associated Electronics & Mfg. Corp., Upper Montclair, NJ 07043 201-783-7800
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
GTE Products Corp., Williamsport, PA 17701 717-326-6591
GTI/Electronics Div., Hadley, PA 16130 412-253-3161
† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
† National-Standard Co., Niles, MI 49120 616-683-8100
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353

Wire, Shielded-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 .... C•1762
§ American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862, 401-726-0700 .... C•1763
§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1767
§† Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 .... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 .... C•1820-1822
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .... C•1848,1853
§† Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 .... B•1019, C•1865
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 .... C•1878
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 .... C•1882
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 .... C•1886
† Rowe Industries, Inc., Toledo, OH 43612, 419-729-9761 .... C•1922
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 .... C•1928-1931,1941
Adirondack Wire & Cable, ACS Industries Inc., Woonsocket, RI 02895 1-401-769-1600
Alden Products Co., Brockton, MA 02403 508-583-0160
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
AT&T Microelectronics, Allentown, PA 18103 .... 1-800-372-2447;In Can.: 1-800-553-2448
§ Baron Wire & Cable, Skokie, IL 60076 312-677-5000
§† Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
† BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
§† Capcon, Inc., New York, NY 10001 212-243-6275
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 .... 312-459-1000;800-323-0198
Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
§† Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Inc., Phoenix, AZ 85076 602-526-1290
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§ JSC Wire & Cable, Wayne, NJ 07474 .... 201-694-6200;1-800-572-9473
§† Judd Wire Inc., San Marcos, CA 92069 619-744-7720
§ Lynn Electronics, Feasterville, PA 19047 .... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
Okonite Co., Ramsey, NJ 07446 201-825-0300
Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342

§ Pacific Electricord, Gardena, CA 90247 213-532-6600
Permaluster, Inc., Burbank, CA 91504 ..... 213-849-4543;213-849-6454
† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
Precision Interconnect, Portland, OR 97224 503-620-9400
Radix Wire Co., Cleveland, OH 44132 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Rockland Insulated Wire & Cable, Haverstraw, NY 10927 914-429-3103
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
† Storm Products Co., Hinsdale, IL 60521 312-323-9121
§ Tappan Wire & Cable, Tappan, NY 10983 914-359-9300
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
§† Wilco Wire & Cable Co., Inc., San Jose, CA 95133 408-926-8880

Wire Shielding-Also See Braid, Cable-4525

§ Anco Elctrns., Pan Intl., Rancho Cucamonga, CA 91730, 714-945-1365 .. C•1767
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1827
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† GSI Corp., Timonium, MD 21093, 301-252-1768 ..... C•1862
† Magnetic Shield Corporation, Perfection Mica Co., Bensenville, IL 60106, 312-766-7800 ..... C•1743
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... C•1878
Schlegel Corp., Rochester, NY 14692, 716-427-7200 ..... C•1747
† Tecknit (Eastern Facility), Cranford, NJ 07016, 201-272-5500 ..... C•1749
Weico Wire & Cable, Edgewood, NY 11716, 516-254-2970 .... C•1928-1931,1941
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§ Baron Wire & Cable, Skokie, IL 60076 312-677-5000
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
Burndy Corporation, Norwalk, CT 06852 203-838-4444
Cable Systems, Inc., Everett, MA 02149 617-389-7080
§ Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
† Conductive System, Inc., Amsterdam, NY 12010 518-843-5740
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Egis Corporation, Barrington, IL 60011-0751 312-639-4448
† Electro Weave, Worcester, MA 01604 617-752-8932
Flexible Technologies Division, Arlon, Inc., E. Providence, RI 02914 800-556-7683
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† Manger Electric Company, Inc., Stamford, CT 06902 203-348-7761
§ Markel Corp., Norristown, PA 19404 215-272-8960
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Panduit Corp., Tinley Park, IL 60477-0981 800-777-3300
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
† Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Storm Products Co., Hinsdale, IL 60521 312-323-9121
† Sunbank Electronics, Paso Robles, CA 93446 805-238-2840
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
Texas Instruments, Connector System, Attleboro, MA 02703 ..... 508-699-5269; 508-699-3450
Texas Instrs., Matls. & Controls Grp., Attleboro, MA 02703 617-699-3800
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Elec. Wire & Cable, W. Warwick, RI 02893 .. 401-821-1700;SALES 401-821-7800
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
† Zippertubing Co., Los Angeles, CA 90061 213-321-3901

Wire, Stainless Steel-6000

§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... C•1878
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... C•1882
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
† National-Standard Co., Niles, MI 49120 616-683-8100

Wire, Strain Gauge-6000

Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... C•1878
§† MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... C•1882
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
Omega Engineering, Stamford, CT 06907 800-826-6342
† Semiconductor Packaging Materials Co., Mamaroneck, NY 10543 914-698-5353
Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC

Wire Connectors-2100

§ Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Hypertronics Corp., Hudson, MA 01749, 508-568-0451;800-225-9228 .... C•1382
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
WECO Electrical Connectors, Inc., Mooers, NY 12958, 518-298-4810 ..... C•1563-1565,1570,1572,1574
§ WECO Electrical Connectors, Inc., Kirkland, Quebec, CANADA H9H 3L4, 514-694-9136 ..... C•1563-1565,1570,1572,1574
Zierick Manufacturing Corp., Mt. Kisco, NY 10549, 914-666-2911;800-882-8020 ..... C•1580
A E G Corporation, Somerville, NJ 08876-1269 201-231-8300
Autosplice, Inc., Woodside, NY 11377 718-429-0500
§ Concord Electronics Corporation, New York, NY 10012 1-212-777-6571
† Milross Controls, Inc., Southampton, PA 18966 215-355-0200
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
§ Tyton Corp., Milwaukee, WI 53223 414-355-1130
§ Vaco Products, Chicago, IL 60645 312-677-9500

Wire Strippers, Automatic-4100 — *See Vol. D*

Wire Strippers, Chemical — See Chemicals, Wire Stripping (Vol. C)

Wire Strippers, Manual-5400

† Daniels Manufacturing Corp., Orlando, FL 32809, 407-855-6161 ..... C•1753
§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
§ Altech Corp., Somerville, NJ 08876 201-359-4454
§ Burndy Corporation, Norwalk, CT 06852 203-838-4444
§† Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
Contact East, N. Andover, MA 01845 508-682-2000
§ Control Cable, Inc., Baltimore, MD 21207 301-298-4411
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§ Daburn Electronics & Cable Corp., Northvale, NJ 07647 201-768-5400
§ Eraser Co., Syracuse, NY 13221 315-454-3237
† Ewald Instruments Corp., Kent, CT 06757 203-927-3278
§ Excelta Corporation, Torrance, CA 90505 213-772-0751
§ GC-Thorsen, Rockford, IL 61105-1209 815-968-9661
§ General Hardware Mfg., New York, NY 10013 212-431-6100
§ GreenLee Textron Inc.:Subsidiary of Textron Inc., Rockford, IL 61109 ... 815-397-7070
GTE SUPPLY, GTE Communications Systems, Salt Lake City, UT 84116 800-433-4837
§† Ideal Industries, Sycamore, IL 60178 815-895-5181
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ 3M-Electronic Products Division, Austin, TX 78769-2963 512-984-1800
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873
§ OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Omega Engineering, Stamford, CT 06907 800-826-6342
§ Paladin Corp., Newbury Park, CA 91320 805-499-0318
Pasternack Enterprises, Irvine, CA 92713 714-261-1920
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Teledyne Ansonia, Solderless Connector Div., Ansonia, CT 06401 203-735-9311
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† Trans American Transformer, E. Setauket, NY 11733 516-928-0762
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Vaco Products, Chicago, IL 60645 312-677-9500
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677

Wire Strippers, Thermal-5400

§ Clauss Cutlery Co., Alco Industries, Fremont, OH 43420 419-332-7344
† Coherent General, Inc., Sturbridge, MA 01566 508-347-2681
§ Contact, Inc., Hudson, NH 03051 603-883-7708
§† Eraser Co., Syracuse, NY 13221 315-454-3237
§ Ideal Industries, Sycamore, IL 60178 815-895-5181
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
Omega Engineering, Stamford, CT 06907 800-826-6342
Pace Inc., Laurel, MD 20707 301-490-9860
§ Techni-Tool, Plymouth Meeting, PA 19462 215-825-4990
§ Teledyne Kinetics, Div. of Teledyne, Inc., Solana Beach, CA 92075 619-755-1181
† Trans American Transformer, E. Setauket, NY 11733 516-928-0762
§† Western Electronic Products Co., San Clemente, CA 92672 714-492-4677

Wire, Test Lead-6000

ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598, 914-962-2253 ..... C•1762
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 ..... C•1848,1851,1853
† Mueller Elec. Co., Cleveland, OH 44114, 216-771-5225 ..... C•1455
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... C•1882
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
§ Pomona Electronics, Pomona, CA 91766, 714-623-3463 ..... C•1477,1623
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375 ..... 317-983-5200; 800-BELDEN-1
§† Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
Carol Cable Co. Inc., Pawtucket, RI 02862 401-724-9605
§ Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Cooner Wire Co., Chatsworth, CA 91311 818-882-8311
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§ Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
E.M.S., Div. of Sandberg Industries, Tustin, CA 92680 714-669-9473
§ Gavitt Wire & Cable, Brookfield, MA 01506 508-867-6476
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873

§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
§ Rye Industries, Inc., Mamaroneck, NY 10543 914-698-0080
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970

Wire, TFE, Insulated-6000

§ Belden Wire and Cable, Cooper Industries, Richmond, IN 47375, 317-983-5200;800-BELDEN-1 ..... C•1768
§† Brim Electronics, Fair Lawn, NJ 07410, 201-796-2886 ..... C•1820-1821
§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... C•1878
National Wire & Cable Corp., Los Angeles, CA 90031-1780, 213-225-5611 ..... C•1886
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... C•1907
ABL Electronics Supply, Inc., Yorktown Hgts., NY 10598 914-962-2253
§† Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§† Consolidated Electronic Wire & Cable, Franklin Park, IL 60131-1412 312-455-8830
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
§† Dearborn Wire & Cable, Inc., Wheeling, IL 60090 ..... 312-459-1000;800-323-0198
§ Delta Wire & Cable Co., North Chicago, IL 60064 312-473-4990
† Electro Weave, Worcester, MA 01604 617-752-8932
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
§ Olympic Wire & Cable, Fairfield, NJ 07006 201-227-7996
§† Philadelphia Insulated Wire Co. Inc., Moorestown, NJ 08057 609-235-6700
† Phoenix Wire, Inc., S. Hero, VT 05486 802-372-4561
Precision Interconnect, Portland, OR 97224 503-620-9400
§ Pyrocom Co., Seattle, WA 98133 206-365-3535
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Storm Products Co., Hinsdale, IL 60521 312-323-9121
§† Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
§† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
§ Thomas & Betts Corporation, Bridgewater, NJ 08807 201-685-1600
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
† Victor Wire & Cable Corp., Los Angeles, CA 90016 213-870-9933
§† Virginia Plastics Co., Roanoke, VA 24015-0577 703-375-0100
Weico Wire & Cable, Edgewood, NY 11716 516-254-2970
§† Whitmor Wire & Cable, Valencia, CA 91355 805-257-2400
§† Wilco Wire & Cable Co., Inc., San Jose, CA 95133 408-926-8880

Wire, Thermocouple-6000

§† Daburn Electronics & Cable Corp., Northvale, NJ 07647, 201-768-5400 .. C•1848
Judd Wire Inc., Turners Falls, MA 01376, 413-863-4357 ..... C•1865
† Molecu-Wire, Farmingdale, NJ 07727, 201-938-9473 ..... C•1878
MWS Wire Industries, Westlake Village, CA 91362, 818-991-8553 ..... C•1882
Omega Engineering, Stamford, CT 06907, 800-826-6342 ..... C•1907
Acme Elec. Heating Corp., Hialeah, FL 33013 305-685-8326
§ Alpha Wire Corp., Elizabeth, NJ 07207-0711 201-925-8000
§† American Insulated Wire Corp., Leviton Mfg. Co., Pawtucket, RI 02862 ... 401-726-0700
Barber-Colman Co., Indl. Instrs. Div., Rockford, IL 61125-7040 815-877-0241
§ Berk-Tek Inc., New Holland, PA 17557 717-354-6200
§† BIW Cable Systems, Inc., N. Dighton, MA 02764 508-822-6600
§ Brim Electronics, Fair Lawn, NJ 07410 201-796-2886
§ BRIntec Corp., Brand-Rex Cable Systems Division, Willimantic, CT 06226-1128 203-456-8000
† Carpenter Technology Corp., Reading, PA 19612 215-371-2000
§ Chester Cable, Alcatel, N. A., Chester, NY 10918 914-469-2141
§ Continental Wire & Cable, York, PA 17405 717-792-2644
§ Custom Cable Corp., Westbury, NY 11590 516-334-3600
† DELTA M Corporation, Oak Ridge, TN 37830 615-483-1569
§ EDL, Inc., Hauppauge, NY 11788 ..... 516-435-2808;1-800-DIAL EDL
† Electro Weave, Worcester, MA 01604 617-752-8932
† General Wire Products, Inc., Worcester, MA 01604 617-752-8260
§ GIC Thermodynamics, Royal Oak, MI 48073 313-280-1648
§† Gordon Co.:Watlow, Richmond, IL 60071 815-678-2211
† W. L. Gore & Assocs., Newark, DE 19714 302-738-4880
§† International Wire Products Co., Wyckoff, NJ 07481 201-891-5800
ITT Cannon:Military/Aerospace Div., Santa Ana, CA 92705-5684 714-557-4700
Leeds & Northrup, General Signal, North Wales, PA 19454 215-699-2000
§ Love Controls Corp., Wheeling, IL 60090 312-541-3232
Lynn Electronics, Feasterville, PA 19047 ..... 215-677-6700;800-523-6075
§ Manhattan Electric Cable Corporation, Rye, NY 10580 914-967-8000
§† Markel Corp., Norristown, PA 19404 215-272-8960
Okonite Co., Ramsey, NJ 07446 201-825-0300
§ Pyrocom Co., Seattle, WA 98133 206-365-3535
Radix Wire Co., Cleveland, OH 44132 216-731-9191
Raychem Corp., Elctrns. Grp., Menlo Park, CA 94025 415-361-3860
Richards, Arklay S., Co., Inc., Newton Highlands, MA 02161-1793 617-527-4385
Rowe Industries, Inc., Toledo, OH 43612 419-729-9761
† Santa Fe Textiles, Barcel Wire & Cable, Santa Ana, CA 92704-5863 714-751-7733
§ Science/Electronics, Dayton, OH 45401-0986 513-859-5555
§ S. F. Products Corporation, Southport, CT 06490 203-929-6180
§† Specialty Cable Corporation, Wallingford, CT 06492 ..... 800-456-SPEC
§† Standard Wire & Cable Co., Rancho Dominguez, CA 90220 ..... 213-609-1811; 800-447-0006/821-527
Tensolite Company, Subsidiary of Carlisle Corp., Buchanan, NY 10511 .. 914-737-5600
† Thermax Wire Corp., Flushing, NY 11354-2897 718-939-8300
† Thermo Electric, Saddle Brook, NJ 07662 201-843-5800
† Thermometrics, Inc., Edison, NJ 08817-4695 201-287-2870
† United Wire & Cable Corp., Worcester, MA 01604 617-757-3872
§ West Instrument, A Mark IV Company, Schiller Park, IL 60176 312-678-6400

Wire, Transmission — See Cable, Transmission Line (Vol. C)

Wire, Twisted Pair — See Cable, Twisted Pair (Vol. C)

Wire (MIL)-2440 — *See Vol. B*

Wire Twisters, Automatic-5400

§ Eraser Co., Syracuse, NY 13221 315-454-3237
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
Rutherford Research, Rutherford, NJ 07070 201-933-2091

Wire Twisters, Manual-5400

Eraser Co., Syracuse, NY 13221 315-454-3237
Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§ Mouser Electronics, Mansfield, TX 76063 800-346-6873

Wire Ways-6000

§ Panduit Corp., Tinley Park, IL 60477-0981, 800-777-3300 ..... C•1909
† Breeze-Illinois, TransTechnology Corp., Peoria, IL 61615-1584 309-693-3300
§ Nichifu America, Inc., Pottstown, PA 19464 215-323-7120
OK Industries, Inc., Yonkers, NY 10701 914-969-6800
§ Square D Co., Palatine, IL 60067 312-397-2600
§† Tyton Corp., Milwaukee, WI 53223 414-355-1130

Wirewrapping Services — See Services, Wirewrapping (Vol. D)

Wiring Panels & Boards, Computer — See Boards, Programming (Vol. C)

Word Processors, Shared Logic Systems-2025 — *See Vol. D*

Word Processors, Standalone Systems-2025 — *See Vol. D*

Work Positioners, Circuit Board & Chassis — See Holders, Circuit Board (Vol. D), Jigs (Vol. D)

Work Room, Shielded-1400

† Lindgren RF Enclosures, Inc., Glendale Hgts., IL 60139 312-307-7200

Work Stations, Computer-2000 — *See Vol. D*

Work Stations, Laminar Flow-4100 — *See Vol. D*

Work Stations/Decks, Data Entry-1400

Advance, A Unit of Zero Corporation, N. Hollywood, CA 91605, 818-983-0333 ..... C•1099
D. L. Custom, Markham, Ont, CANADA L3R 2M5, 416-475-0275 ..... C•1021
Kalamazoo Technical Furniture, Kalamazoo, MI 49005, 616-385-2255;800-832-5227 ..... C•1058
National Instruments, Austin, TX 78727-6204, 512-250-9119 ..... D•1272-1273
† Optima Enclosures, Tucker, GA 30084-5088, 404-496-4000 ..... C•1062,1064
Par Metal Products, Inc., Brooklyn, NY 11216, 718-774-5900 ..... C•1076
Stantron, Unit of Zero Corporation, N. Hollywood, CA 91605, 818-841-1825 ..... C•1098
Alusett U.S.A., Inc., Pleasantville, NY 10570 914-747-3477
§† Bud Industries, Inc., Willoughby, OH 44094-0431 216-946-3200
§† Compucart, Versa Tec, Tampa, FL 33606 ..... 800-237-9024;813-251-2431
§ Ergotron, Inc., Eagan, MN 55121 612-452-8135
Everest Electronic Equipment, Lawrenceville, GA 30243 404-995-8688
Everest Electronic Equipment, Inc., Anaheim, CA 92806 714-634-2200
† General Devices Co., Inc., Indianapolis, IN 46239-9632 317-897-7000
§ Hammond Manufacturing Co., Buffalo, NY 14225 716-894-5710
§ Hewlett-Packard Co., Cupertino, CA 95014 800-752-0900
§ Hodge Manufacturing Co., Inc., Springfield, MA 01107 413-781-6800
Kewaunee Scientific Corp., Technical Workstation Div., Lockhart, TX 78644 512-398-5292
Mobile-Tronics Co., Inc., Tustin, CA 92680 714-546-0884
† Terminal Data Corp., Rockville, MD 20855 301-921-8282
Zero Corp., Zero East Div., Monson, MA 01057 413-267-5561

Wrenches-5400

Contact East, N. Andover, MA 01845 508-682-2000
§† Cooper Tools, Raleigh, NC 27622 919-781-7200
§ Jensen Tools, Inc., Axia, Inc., Phoenix, AZ 85044 602-968-6241
§† Jonard Industries Corp., Tuckahoe, NY 10707 914-793-0700
§† M/A-COM Omni Spectra, Inc., Merrimack, NH 03054 603-424-4111
§ Mann, Henry, Inc., Huntingdon Valley, PA 19006 215-355-7200
§† Moody Tools, Inc., E. Greenwich, RI 02818 401-885-0911
§ Ridge Tool Co., Sub. Emerson Elec. Co., Elyria, OH 44036 216-323-5581
§ The Triangle Tool Group, Inc., Orangeburg, SC 29115 803-534-7010
§ Vaco Products, Chicago, IL 60645 312-677-9500

X-ray Detector Arrays (For Industrial Inspections)-4100 — *See Vol. D*

X-ray Imaging System-4100 — ***See Vol. D***

X-ray Inspection Equipment-4100 — ***See Vol. D***

X-Y Axis Tables — See Simulators, Motion (Vol. D)

X-Y-Z Systems, Programmable-2550 — ***See Vol. D***

Yokes, Deflection, CRT-1800 — ***See Vol. A***

Yokes, Deflection, Oscilloscope-1800 — ***See Vol. A***

Yokes, Deflection, Radar PPI-1800 — ***See Vol. A***

Yokes, Deflection, TV Camera-1800 — ***See Vol. A***

Zener Diodes — See Diodes, Zener

Zone Boxes, Thermocouple — See Thermocouples, Elements & Accessories (Vol. B)

COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

MINIGLOSSARY
BASIC ASCII CODE

				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	|
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

Control Character Representations

NUL	Null
SOH	Start of Heading (CC)
STX	Start of Text (CC)
ETX	End of Text (CC)
EOT	End of Transmission (CC)
ENQ	Enquiry (CC)
ACK	Acknowledge (CC)
BEL	Bell
BS	Backspace (FE)
HT	Horizontal Tabulation (FE)
LF	Line Feed (FE)
VT	Vertical Tabulation (FE)
FF	Form Feed (FE)
CR	Carriage Return (FE)
SO	Shift Out
SI	Shift In
DLE	Data Link Escape (CC)
DC1	Device Control 1
DC2	Device Control 2
DC3	Device Control 3
DC4	Device Control 4
NAK	Negative Acknowledge (CC)
SYN	Synchronous Idle (CC)
ETB	End of Transmission Block (CC)
CAN	Cancel
EM	End of Medium
SUB	Substitute
ESC	Escape
FS	File Separator (IS)
GS	Group Separator (IS)
RS	Record Separator (IS)
US	Unit Separator (IS)
DEL	Delete

(CC) Communication Control
(FE) Format Effector
(IS) Information Separator

Special Graphic Characters

SP	Space
!	Exclamation Point
|	Logical OR
"	Quotation Marks
#	Number Sign
$	Dollar Sign
%	Percent
&	Ampersand
'	Apostrophe
(	Opening Parenthesis
)	Closing Parenthesis
*	Asterisk
+	Plus
,	Comma
-	Hyphen (Minus)
.	Period (Decimal Point)
/	Slant
:	Colon
;	Semicolon
<	Less Than
=	Equals
>	Greater Than
?	Question Mark
@	Commercial At
[	Opening Bracket
\	Reverse Slant
]	Closing Bracket
^	Circumflex
¬	Logical NOT
_	Underline
`	Grave Accent
{	Opening Brace
¦	Vertical Line (This graphic is stylized to distinguish it from Logical OR)
}	Closing Brace
~	Tilde

CHARACTERISTICS OF BATTERIES AND FUEL CELLS

System	Anode	Cathode	Theoretical battery		Practical battery		
			Voltage, V	Capacity, Ah/kg	Typical voltage, V	Capacity[a]	
						Wh/kg	Wh/dm³
Primary:							
Leclanche	Zn	MnO_2	1.6	230	1.2	65	175
Magnesium	Mg	MnO_2	2.0	270	1.5	100	195
Organic cathode	Mg	*m*-DNB	1.8	1,400	1.15	130	180
Alkaline MnO_2	Zn	MnO_2	1.5	230	1.15	65	200
Mercury	Zn	HgO	1.34	185	1.2	80	370
Mercad	Cd	HgO	0.9	165	0.85	45	175
Silver oxide	Zn	AgO	1.85	285	1.5	130	310
Zinc-air	Zn	Air (O_2)	1.6	815	1.1	200	190
Li-organic electrolyte	Li	[b]	2.1-5.4	130-660	1.8-3.2	250	400
Secondary:							
Lead-acid	Pb	PbO_2	2.1	55	2.0	37	70
Edison	Fe	Ni oxides	1.5	195	1.2	29	65
Nickel-cadmium	Cd	Ni oxides	1.35	165	1.2	33	60
Silver-zinc	Zn	AgO	1.85	285	1.5	100	170
Silver-cadmium	Cd	AgO	1.4	230	1.05	55	120
Zinc-nickel oxide	Zn	Ni oxides	1.75	185	1.6	55	110
Zinc-air[c]	Zn	Air (O_2)	1.6	815	1.1	150	155
Cadmium-air[c]	Cd	Air (O_2)	1.2	475	0.8	90	90
Zinc-O_2	Zn	O_2	1.6	610	1.1	130	120
H_2-O_2	H_2	O_2	1.23	3,000	0.8	45	65
Reserve:							
Cuprous chloride	Mg	CuCl	1.5	240	1.4	45	65[d]
Silver-chloride	Mg	AgCl	1.6	170	1.5	60	95[d]
Zinc-silver oxide	Zn	AgO	1.85	285	1.5	30	75[e]
Thermal	Ca	[b]	2.8	240	2.6	10	20[f]
Ammonia-activated	Mg	*m*-DNB	2.2	1,400	1.7	22	60[g]
High-temperature	NA	S	2.1	685	1.8	200	[h]
	Li	S	2.2	1,150	1.8	200	[i]
Solid electrolyte	Ag	Polyiodide	0.66	. . .	0.6	180	75[j]
Fuel cell:							
Hydrogen[c]	H_2	Air	1.23	26,000 .	0.7		[k]
Hydrazine[c]	N_2H_4	Air	1.5	2,100	0.7	800[b]	[l]
Methanol[c]	CH_2OH	Air	1.3	1,400	0.9	175[b]	185[m]

a Delivered capacity when discharged at normal temperatures (20°C) at normal discharge rates.
b Based on fuel consumption only.
c Weight of air not considered in computation of watt hours.
d Water-activated
e Automatically activated; high rate discharge; 2- to 10-min rate.
f Fused salt; heat-activated; high rate discharge; 2- to 10-min rate.
g Four-minute discharge rate.
h β-alumina electrolyte, 300°C operation.
i Fused salt; 350°C operation.
j Solid $RbAg_4I_5$ electrolyte.
k Several different cathode materials used.
l Fuel consumption is based on source of H_2.
m Based on methanol battery-fuel supply in situ.

MINIGLOSSARY CAPACITORS

Anode: One of two plates or conductors. In polarized capacitors, the anode should be connected to the positive conductor in the circuit.

Capacitive Reactance: The opposition (in ohms) of capacitance to the flow of alternating current, equal to the reciprocal of the product of the angular frequency (2π times frequency in Hertz) of the current times the capacitance in farads.

Cathode: One of two plates or conductors. In electrostatic capacitors the cathode is metallic. In electrolytic capacitors the cathode is a liquid, gel or other conductive material which is in intimate contact with a metallic cathodic connection.

Dielectric Constant: The ratio of the capacitance of a capacitor with some material other than air between the capacitor plates to the capacitance of the same capacitor with air between the plates. For example, the dielectric constants of air, Teflon®, polystyrene and ruby mica are 1, 2.1, 2.6 and 5.4, respectively.

Electrolytic: A capacitor with one metallic conductor (generally the anode) and with a liquid or semiconductor cathode. Nonpolarized electrolytic capacitors generally have two equal anodes as well as the liquid cathode. These anodes operate alternately as anode and cathodic connection as alternating current is applied.

Electrostatic: One of two general classes of capacitors in which two or more discrete metallic conductors are present and separated by an insulating dielectric material. Examples include: mica, ceramic, film, and paper types.

Farad: The basic unit of measure in capacitors. A capacitor charged to one volt with a charge of one coulomb (one ampere flowing for one second) has a capacitance of one farad. Capacitors are generally rated at portions of a farad (microfarads or picofarads).

1 farad (F) = 1,000,000 microfarads (μF) 1 microfarad (μF) = 1,000,000 picofarads (pF)

Impedance: All capacitors exhibit impedance. It is a function of capacitor type and internal construction. This can be particularly important in certain applications such as filters for switching power supplies. Capacitors used in these applications often have special multiple tab construction to shorten current paths and to reduce internal resistance.

Leakage Current: Expressed as dcl for electrolytic capacitors, a measure of the intrinsic losses in a charged capacitor. Generally speaking, the lower the dcl, the higher quality the capacitor.

Power Factor: A measure of the overall efficiency of a capacitor. Power factor ratings take all internal losses into consideration in a complex formula. This parameter of certain capacitors is often very important in AC applications such as motor-start and/or motor-run capacitors

Rated Voltage: The rated working voltage of a capacitor. Generally expressed in DC Volts (Vdcw). This is the voltage at which a capacitor may be safely operated at 25°C continuously within its overall parameters.

Ripple Current: The total amount of alternating and direct current that may be applied to an electrolytic capacitor under stated conditions. In general, the higher the ripple current applied, the shorter the operating life of the capacitor will be. Application of significantly higher than rated ripple currents can shorten the capacitor life dramatically and may even cause catastrophic failure (explosion).

Surge Voltage: The momentary surge voltage which may be applied for a stated length of time without doing permanent damage to the unit.

Temperature: Capacitors are generally rated at 25°C at sea level under specific humidity conditions. Operating temperature ranges are also given, along with derating (reliability) curves for operation at temperatures other than 25°C.

Temperature Coefficient: Expressed as TC in ppm (parts per million) or in percent (%) from the norm of 25°C. This is seldom a straight line and may vary widely for certain types. Most capacitors have positive TC in that the capacitance increases as temperature increases. Some types, however, have negative TC in that the capacitance decreases as temperature increases.

Ceramic Capacitor Codes
(Capacitance Given In pF)

			Tolerance					
			Class 1					
Color	Digit	Multiplier	10pF or less	Over 10pF	Class 2	Temperature Coefficient ppm°C	Significant Figure	Multiplier
Black	0	1	±2.0pF	±20%	±20%	0	0.0	–1
Brown	1	10	±0.1pF	±1%		–33		–10
Red	2	100		±2%		–75	1.0	–100
Orange	3	1000		±3%		–150	1.5	–1000
Yellow	4	10000			+100% –0%	–220	2.0	–10000
Green	5		±0.5pF	±5%	±5%	–330	3.3	+1
Blue	6					–470	4.7	+10
Violet	7					–750	7.5	+100
Gray	8	0.01	±0.25pF		+80% –20%	+150 to –1500		+1000
White	9	0.1	±1.0pF	±10%	±10%	+100 to –750		+10000
Silver								
Gold								

MINIGLOSSARY
BASIC CAPACITOR FORMULAS

I. Capacitance (farads)

English: $C = \frac{.224\,K\,A}{t_D}$

Metric: $C = \frac{.0884\,K\,A}{t_D}$

II. Energy stored in capacitors (Joules, watt-sec)

$E = \frac{1}{2}\,CV^2$

III. Linear charge of a capacitor (Amperes)

$I = C\frac{dV}{dt}$

IV. Total Impedance of a capacitor (ohms)

$Z = \sqrt{R_s^2 + (X_C - X_L)^2}$

Where $Rs = ESR$

V. Capacitive Reactance (ohms)

$X_C = \frac{1}{2\,\pi\,fC}$

VI. Inductive Reactance (ohms)

$X_L = 2\,\pi\,fL$

VII. Phase Angles:

Ideal Capacitors: Current leads voltage 90°
Ideal Inductors: Current lags voltage 90°
Ideal Resistors: Current in phase with voltage

VIII. Dissipation Factor

$DF = \tan\delta\ (\text{loss angle}) = \frac{ESR}{X_c} = (2\,\pi\,fC)\ (ESR)$

IX. Power Factor

PF = Sine δ (loss angle) = Cos φ (phase angle)
PF = DF (when less than 10%)

X. Quality Factor (dimensionless)

$Q = \text{Cotan}\ \delta\ (\text{loss angle}) = \frac{1}{DF}$

XI. Equivalent Series Resistance (ohms)

$ESR = (DF)\ (Xc) = (DF)\ (\frac{1}{2}\,\pi\,fC)$

XII. Power Loss (watts)

Power loss $= (2\,\pi\,fCV^2)\ (DF)$

XIII. KVA (Kilowatts)

$KVA = 2\,\pi\,fCV^2 \times 10^{-3}$

XIV. Temperature Characteristic (ppm/°C)

$TC = \frac{Ct - C_{25}}{C_{25}\,(T_t - 25)} \times 10^6$

XV. Cap Drift (%)

$C.D. = \frac{C_1 - C_2}{C_1} \times 100$

XVI. Reliability of Ceramic Capacitors

$\frac{L_o}{L_t} = \left(\frac{V_t}{V_o}\right)^x \left(\frac{T_t}{T_o}\right)^\tau$

XVII. Capacitors in Series (current the same)

Any number: $\frac{1}{C_T} = \frac{1}{C_1} + \frac{1}{C_2} \cdots + \frac{1}{C_N}$

Two: $C_T = \frac{C_1\,C_2}{C_1 + C_2}$

XVIII. Capacitors in Parallel (voltage the same)

$C_T = C_1 + C_2 \cdots + C_N$

XIX. Aging Rate

A.R. = % Δ C/decade of time

XX. Decibels

$db = 20 \log \frac{V_1}{V_2}$

Metric prefixes:

Pico	$\times 10^{-12}$
Nano	$\times 10^{-9}$
Micro	$\times 10^{-6}$
Milli	$\times 10^{-3}$
Deci	$\times 10^{-1}$
Deca	$\times 10$
Kilo	$\times 10^{3}$
Mega	$\times 10^{6}$
Giga	$\times 10^{9}$
Tera	$\times 10^{12}$

Symbols:

K	=	Dielectric Constant
A	=	Area of electrode overlap
t_D	=	Dielectric thickness
V	=	Voltage (volts)
t	=	time (hours)
R_S	=	Series Resistance (ohms)
f	=	frequency (Hertz)
L	=	Inductance (henries)
δ	=	Loss angle
ø	=	Phase angle
x+y	=	Exponent effect of voltage and temperature
L_O	=	Operating life (hours)
L_t	=	Test life (hours)
V_t	=	Test voltage (volts)
V_o	=	Operating voltage (volts)
T_t	=	Test temperature (°C)
T_o	=	Operating temperature (°C)

eem MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination.* This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float.* Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof.* May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card.* The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement.*

Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage.* Can be confused with the term used to describe how many times a connector may be mated and separated.

Withstanding voltage: Also called *test voltage.* The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

MAXIMUM CURRENT CAPACITY—CONDUCTORS

Size, AWG	MIL-W-5088				National Electrical Code	Underwriters Laboratory		American Insurance Association	500 c mils/A
	Copper		Aluminum			60°C	80°C		
	Single-wire	Wire-bundled	Single-wire	Wire-bundled					
30	...	...	...	...	...	0.2	0.4	...	0.20
28	...	...	...	...	...	0.4	0.6	...	0.32
26	...	...	...	...	...	0.6	1.0	...	0.51
24	...	...	...	...	...	1.0	1.6	...	0.81
22	9	5	...	...	...	1.6	2.5	...	1.28
20	11	7.5	...	...	...	2.5	4.0	3	2.04
18	16	10	...	...	6	4.0	6.0	5	3.24
16	22	13	...	...	10	6.0	10.0	7	5.16
14	32	17	...	...	20	10.0	16.0	15	8.22
12	41	23	...	...	30	16.0	26.0	20	13.05
10	55	33	...	...	35	...	...	25	20.8
8	73	46	58	36	50	...	...	35	33.0
6	101	60	86	51	70	...	...	50	52.6
4	135	80	108	64	90	...	...	70	83.4
2	181	100	149	82	125	...	...	90	132.8
1	211	125	177	105	150	...	...	100	167.5
0	245	150	204	125	200	...	...	125	212.0
00	283	175	237	146	225	...	...	150	266.0
000	328	200	...	...	275	...	...	175	336.0
0000	380	225	...	...	325	...	...	225	424.0

MINIGLOSSARY
BASIC
EBCDIC CODE

Bit Positions 4, 5, 6, 7	Second Hexadecimal Digit	Digit Punches	00				01				10				11				
			00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bit Positions 0, 1
			00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bit Positions 2, 3
			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	First Hexadecimal Digit
			12				12	12		12	12	12		12	12				Zone Punches
				11				11	11	11		11	11	11		11			
					0		0		0	0	0		0	0			0		
			9	9	9	9	9	9	9	9									Digit Punches
			①	②	③	④	⑤	⑥	⑦	⑧					⑨	⑩	⑪	⑫	
0000	0	8-1	NUL	DLE	DS		SP	&	-									0	8-1
0001	1	1	SOH	DC1	SOS				⑬		a	j			A	J	⑭	1	1
0010	2	2	STX	DC2	FS	SYN					b	k	s		B	K	S	2	2
0011	3	3	ETX	TM							c	l	t		C	L	T	3	3
0100	4	4	PF	RES	BYP	PN					d	m	u		D	M	U	4	4
0101	5	5	HT	NL	LF	RS					e	n	v		E	N	V	5	5
0110	6	6	LC	BS	ETB	UC					f	o	w		F	O	W	6	6
0111	7	7	DEL	IL	ESC	EOT					g	p	x		G	P	X	7	7
1000	8	8		CAN							h	q	y		H	Q	Y	8	8
1001	9	8-1		EM							;	r	z		I	R	Z	9	9
1010	A	8-2	SMM	CC	SM		¢	!	⑮	:									8-2
1011	B	8-3	VT	CU1	CU2	CU3	.	$	,	#									8-3
1100	C	8-4	FF	IFS		DC4	<	*	%	@									8-4
1101	D	8-5	CR	IGS	ENQ	NAK	(	)	_	'									8-5
1110	E	8-6	SO	IRS	ACK		+	;	>	=									8-6
1111	F	8-7	SI	IUS	BEL	SUB	I	¬	?	"									8-7
			12				12				12	12		12	12	12		12	Zone Punches
				11				11				11	11	11		11	11	11	
					0				0		0		0	0	0		0	0	
			9	9	9	9									9	9	9	9	

Card Hole Patterns

①	12-0-9-8-1	⑤	No-Punches	⑨	12-0	⑬	0-1
②	12-11-9-8-1	⑥	12	⑩	11-0	⑭	11-0-9-1
③	11-0-9-8-1	⑦	11	⑪	0-8-2	⑮	12-11
④	12-11-0-9-8-1	⑧	12-11-0	⑫	0		

Control Character Representations

ACK	Acknowledge
BEL	Bell
BS	Backspace
BYP	Bypass
CAN	Cancel
CC	Cursar Control
CR	Carriage Return
CU1	Customer Use 1
CU2	Customer Use 2
CU3	Customer Use 3
DC1	Device Control 1
DC2	Device Control 2
DC4	Device Control 4
DEL	Delete
DLE	Data Link Escape
DS	Digit Select
EM	End of Medium
ENQ	Enquiry
EOT	End of Transmission
ESC	Escape
ETB	End of Transmission Block
ETX	End of Text
FF	Form Feed
FS	Field Separator
HT	Horizontal Tab
IFS	Interchange File Separator
IGS	Interchange Group Separator
IL	Idle
IRS	Interchange Record Separator
IUS	Interchange Unit Separator
LC	Lower Case
LF	Line Feed
NAK	Negative Acknowledge
NL	New Line
NUL	Null
PF	Punch Off
PN	Punch On
RES	Restore
RS	Reader Stop
SI	Shift In
SM	Set Mode
SMM	Start of Manual Message
SO	Shift Out
SOH	Start of Heading
SOS	Start of Significance
SP	Space
STX	Start of Text
SUB	Substitute
SYN	Synchronous Idle
TM	Tape Mark
UC	Upper Case
VT	Vertical Tab

Special Graphic Characters

¢	Cent Sign
.	Period, Decimal Point
<	Less-than Sign
(	Left Parenthesis
+	Plus Sign
!	Logical OR
&	Ampersand
!	Exclamation Point
$	Dollar Sign
*	Asterisk
)	Right Parenthesis
;	Semicolon
¬	Logical NOT
-	Minus Sign, Hyphen
/	Slash
,	Comma
%	Percent
_	Underscore
>	Greater-than Sign
?	Question Mark
:	Colon
#	Number Sign
@	At Sign
'	Prime, Apostrophe
=	Equal Sign
"	Quotation Mark

MINIGLOSSARY ENCAPSULATION

MATERIALS/HANDLING

Catalyst: A substance which changes the *rate* of chemical reaction. Very small quantities can cause fast change.

Conformal coating Sprayed or dipped. A thin conformal jacket which protects an assembly from moisture or other degrading environments.

Curing agent: See catalyst.

Hardener: See catalyst.

Hermetic: A permanent gas-tight seal.

RTV: Room Temperature Vulcanizing. Associated with silicone rubber sealants which vulcanize at room temperature.

Thermoplastic: Plastic materials which can be made to flow *repeatedly* with the application of heat.

Thermosetting: Plastics which once cured cannot be made to flow again.

Thixotropy: The property of a coating compound which has low viscosity when agitated, but which thickens when the agitation ceases.

Viscosity: Measured in units of *poise* or *centipoise*. The property of a liquid which resists internal flow. Low viscosity equates with thin and vice-versa.

PROCESSING

Casting: Parts or assemblies are placed in a mold. Encapsulating material is added and cured. Part is then removed from the mold.

Dip coating: Part or assembly is dipped into the encapsulating material. Final thickness is determined by number of dips, viscosity, rate of withdrawal, and temperature.

Embedding: Wherein an encapsulant substantially fills all voids in and about an assembly.

Impregnation: A process of encapsulation involving evacuating all air and then allowing the encapsulating material to flow in and fill all voids.

Molding: Similar to casting except this process usually implies multicavity molds and costly machines.

Potting: Wherein the part or assembly is immersed in an encapsulating material contained in a shell which becomes a permanent outer surface after curing.

DIELECTRIC

Arc resistance: An encapsulant's resistance to the formation of a conductive path or track. Measured in time.

Breakdown voltage: The voltage at which an encapsulant fails electrically.

Capacitance: The property of conductors and dielectrics which allows the storage of an electrical charge when the voltage is applied.

Corona: A luminous discharge of electricity due to air ionization when a certain voltage is reached. Can be internal or external. The formation of ozone can cause rapid deterioration of certain materials.

Dielectric: Insulator (Nonconductor.)

Dielectric constant: The property of a material that determines its ability to store electrostatic energy.

Dielectric strength: The ratio of dielectric breakdown to the thickness of insulating material.

Dissipation factor: The ratio of a dielectric material's energy losses.

Flashover: Point at which an electric discharge occurs around an edge or across a surface. Can result in a carbon track and permanent degradation.

Insulation resistance: (IR) An insulating material's total DC leakage.

Surface resistivity: The resistance of the surface of an insulating material to the flow of direct current.

Voltage endurance: Sometimes called corona resistance. The ability of a material to withstand the application of sustained high voltage.

Volume resistivity: The resistance of a material to direct current flow as a measure of volume. Expressed as ohm-centimeters.

eem MINIGLOSSARY OPTO SEMICONDUCTORS

Avalanche Photodiode: A photodiode that takes advantage of avalanche multiplication of photocurrent. It is particularly suited to low noise and/or high speed applications.

Contrast: A noticeable difference in color, brightness, or other characteristics in a side-by-side comparison.

Chrominance Contrast: The color contrast between two adjacent surfaces of identical area, shape, texture, and luminance. The human eye is more sensitive to differences in color than it is to differences in brightness.

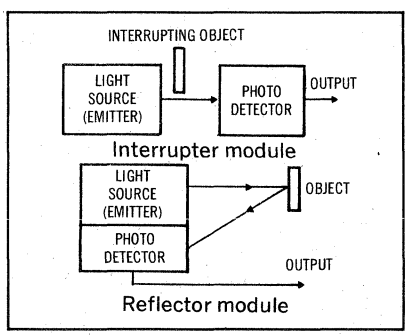
Current Transfer Ratio: The ratio of an optocoupler's output current to input current at a specified bias.

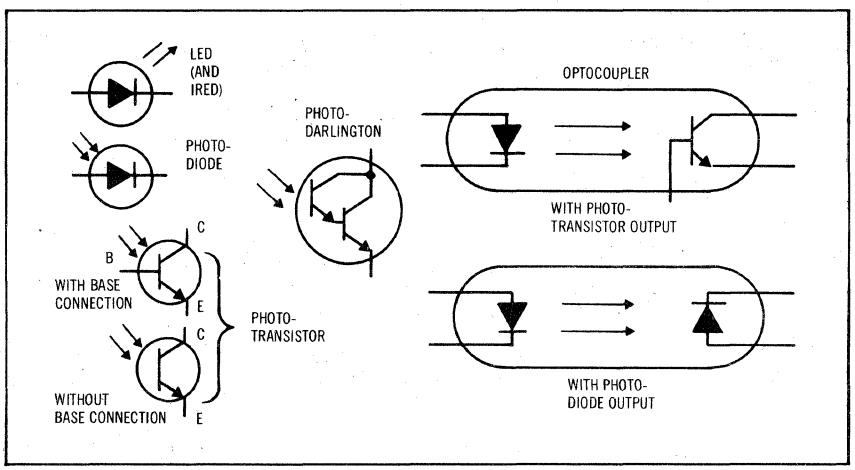
Dark Current: The leakage current of a photodetector with no incident light.

Dominant Wavelength: The wavelength that is a quantitative measure of apparent color of light as perceived by the human eye.

Infrared Radiation: The electromagnetic wavelength region between approximately 0.75 and 100 micrometers longer than the wavelength of visible light.

Interrupter (module): A device that produces an electrical output signal when an object breaks the light (visible or invisible) between a light source and a photodetector.





IRED: An infrared-emitting diode. See light-emitting diode.

Light Current: The current that flows through a photodetector when it is exposed to radiant energy.

Light-Emitting Diode (LED): A semiconductor diode that emits incoherent light at its PN junction when forward biased. The light can be in the visible or invisible (infrared) wavelength region.

Luminance Contrast: The observed brightness of a light-emitting element compared to the brightness of the "surround," an integral part of the device and inseparable from it.

Optocoupler: A device that transmits electrical signals, without electrical connection, between a light source (input) and the receiver (output). The input is generally an LED; the output might be a photodiode, phototransistor, a photo–Darlington, etc. Sometimes referred to as optoisolator.

Peak Wavelength: The wavelength at the peak of the radiated spectrum of an emitter.

Photo–Darlington: A light-sensitive Darlington-connected transistor pair. The photo–Darlington has a very high sensitivity to illumination or radiation.

Photodetector: A device that provides an electrical output signal when subjected to radiation in the visible, infrared, or ultraviolet regions of the electromagnetic spectrum. Photodiodes, phototransistors, and photo–Darlingtons are the most common type of photodetectors.

Photodiode: A junction diode that is responsive to radiant energy. Photodiodes have a high degree of linearity between the input radiation and the output current, and faster switching speeds than phototransistors.

Photothyristor: A thyristor whose switching action is controlled by light applied to the thyristor gate.

Phototransistor: A light-sensitive transister that delivers an electrical output proportional to the light intensity at its input. The low-level photocurrent that is generated is amplified by the current gain of the transistor. The base region (or gate in a FET) may or may not be brought out as an external terminal.

Point Source: A source with a maximum dimension less than one-tenth the distance between sources and detector.

Reflector (module): A device containing a light source and a photodetector that detects any object that reflects light produced by the source back to the detector.

MINIGLOSSARY POWER SUPPLIES

Ambient reference: Refers to the temperature of the still air surrounding the power supply

Case reference: One of the specs that make up the nominal rating. The temperature of the case with the temperature of the surrounding still air at a stated temperature (usually 25°C).

Crowbar circuit: Protects the load. A protective circuit that applies a short circuit across the output immediately upon overload. (See overvoltage).

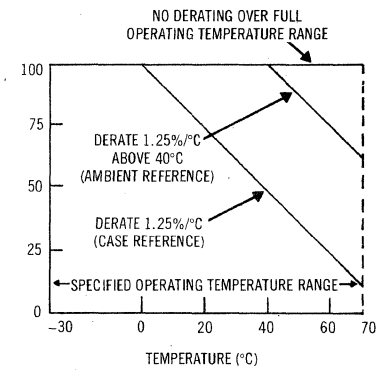


Fig. 1. Power output derating can be referred to ambient or case.

Derating: The degree output is reduced as temperature increases. Usually referenced to ambient case temperature and shown on a graph.

Efficiency: Ratio of the output power to the required input power. Usually expressed as a percentage given nominal environmental temperature.

EMI/RFI: Interference electronic circuitry caused by energy from electromechanical or radio frequency power supplies.

Foldback: Built-in protective circuits that automatically reduce the output voltage and/or current to very low levels in the event of an overload.

Holdover (Holdup): The interval that rated output will continue after input ceases. Usually milliseconds.

Input reflected current: The peak-to-peak alternating current generated by switching transients in DC/DC converters. Should not exceed 1%.

Inrush current limiting: Built-in circuits that monitor high currents through the rectifiers to the capacitors at turn ON. Circuit is usually inhibited as capacitors attain full charge.

Nominal rating: The spec value of the supply at stated conditions of input, output, and temperature.

Overshoot: A transient voltage change occurring during turn ON or OFF or during an abrupt load change.

Overvoltage (Overload) protection: Built-in circuits that protect the load or the supply by shutting it down or providing foldback.

Recovery: The time interval between the termination of an overload and restoration to normal operations.

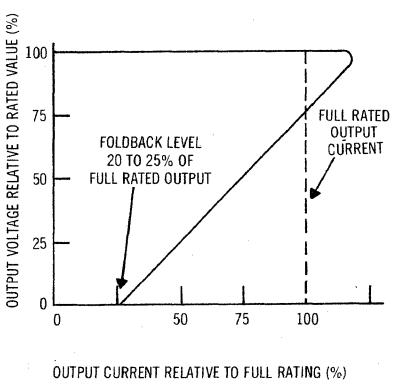


Fig. 2. Current foldback limiting self-resets with removal of fault.

Response: The time interval between a stated step change in input voltage or load current and return of output to normal operating conditions.

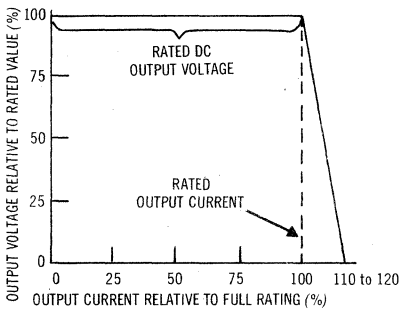


Fig. 3. Current limiting restrictions output current to a valve somewhat greater than full rated output; it resets when fault is removed.

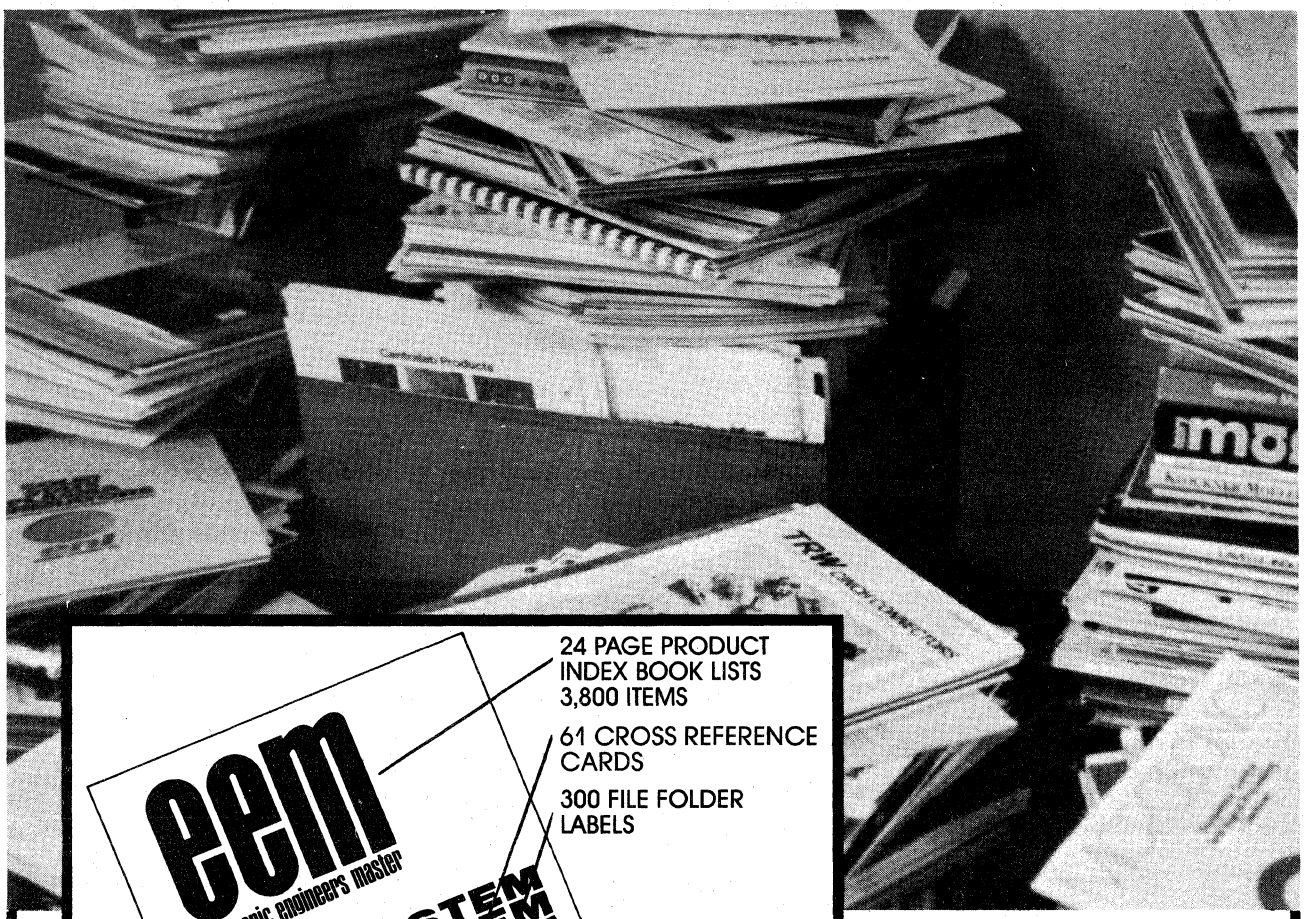
Sensing: Regulation techniques that monitor output voltage and/or current. *Local sensing* refers to the output terminals. *Remote sensing* allows a feedback from the load circuit to the power supply.

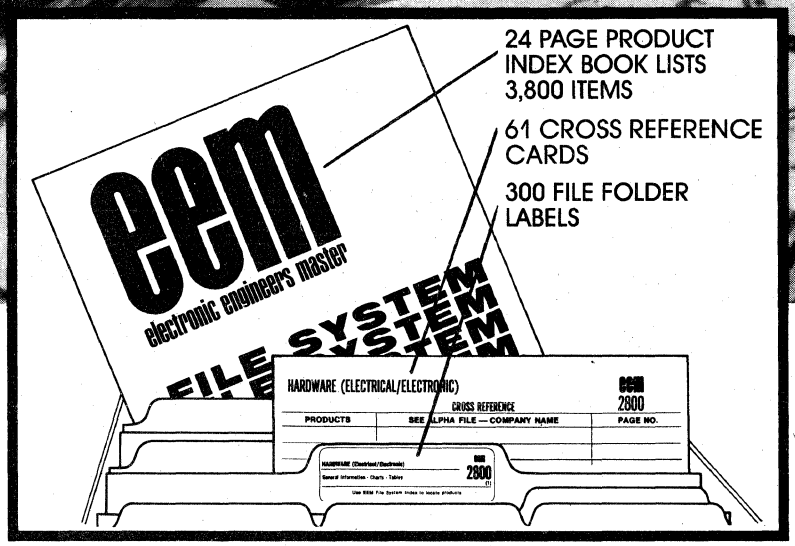
Soft start: Allows the supply to start from zero current and/or voltage over a stated period of time during start up to prevent voltage overshoots and current imbalances.

Switchers: Power supplies using switching techniques to achieve high efficiency regulation. These techniques can have attendant EMI/RFI problems.

Tracking: The maintaining of fixed ratios between multiple outlets despite variations in line, load or temperature. Particularly important in supplies with symetrical (+)(−) outputs.

Transient protection: Circuitry designed to protect the supply from high amplitude line transients. Generally expressed in terms of peak voltage and maximum transient time duration.





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89
90 Manufacturers and Sales Offices Directory

Each manufacturer is listed alphabetically with complete address and telephone number of main offices. The names of those with data pages in this edition of EEM are shown in **boldface**

Many manufacturers also show FAX, TWX and Telex numbers, FSC (Federal Supply Code), other pertinent company data, their sales and/or local distributor offices and phones. The page numbers of their data pages in this edition are shown in all volumes.

AAK CORPORATION

FAX: 508-373-8881

AAK CORP, 747 River St., Haverhill, MA 01832, Tel: 508-373-3769, TELEX: 04 26 3109-1; FSC No.: 04 26 3109-1; Empl.: 20; *Sls. Mgr.:* Marie Credit ..... **D•1542-1543**

Local Sales Offices & Reps

CA	Los Angeles, Power Partners	213-215-0800
GA	Atlanta, Magaro & Assocs.	404-451-8862
IN	Indianapolis, Loren Green Assocs.	317-293-9827
MN	Minneapolis, Hei-Lite Sls.	612-861-6051
OH	Cleveland, Tiby Co.	216-371-5335
PA	Cheltenham, Stein Instr. Corp.	215-379-1990

AAVID™

FAX: 603-528-1478

AAVID ENGINEERING, INC., One Kool Path, P.O. Box 400, Laconia, NH 03247-0400, Tel: 603-528-3400, TWX: 510-298-1127; FSC No.: 30161; Empl.: 350; *Sls. Mgr.:* Charles Nelson; *Dist. Mgr.:* David Mendel ..... **C•1634-1639**

Local Sales Offices & Reps

AL	Huntsville, Cartwright & Bean, Inc.	205-830-1540
AZ	Phoenix, Jarko Assocs. Inc.	602-243-4387
CA	San Jose, Quantum Coefficient, Inc.	408-432-1070
CO	Boulder, Lillard Sls., Inc.	303-447-9288
FL	Deerfield Bch., Cartwright & Bean, Inc.	305-429-3400
FL	Orlando, Cartwright & Bean, Inc.	305-422-4531
GA	Norcross, Cartwright & Bean, Inc.	404-368-0160
IL	Glendale Hgts., Beta Technlg. Sls., Inc.	312-790-9886
IN	Carmel, Kahsar Sls. Inc.	317-844-9353
IA	Des Moines, S P S Assocs.	515-225-0607
KS	Olathe, S P S Assocs.	913-764-4460
LA	Covington, Cartwright & Bean, Inc.	504-892-1780
MD	Hunt Valley, Marktron, Inc.	301-628-1111
MD	Rockville, Marktron, Inc.	301-251-8990
MA	Millis, Selmark Assocs., Inc.	617-376-2914
MI	Ann Arbor, Kahsar Sls. Inc.	313-769-0131
MN	Brainerd, Mitchell Johnson	218-829-8180
MS	Jackson, Cartwright & Bean, Inc.	601-981-1170
MO	Earth City, S P S Assocs.	314-291-0520
NE	Panama, S P S Assocs.	913-764-4460
NJ	Berkeley Hgts., Cambridge-Allen & Assocs.	201-464-0203
NJ	Medford, Jack McCoy, Inc.	609-953-0770
NM	Albuquerque, Ron-Tek, Inc.	505-299-4124
NY	Endwell, Reagan/Compar Binghamton	607-754-2171,607-754-8946
NY	Fairport, Reagan/Compar Corp.	716-271-2230
NY	New Hartford, Reagan/Compar Syracuse/Utica	315-732-3775,315-735-9831
NC	Charlotte, Cartwright & Bean, Inc.	704-536-0303
NC	Raleigh, Cartwright & Bean, Inc.	919-876-4130
OH	Cincinnati, Kahsar Sls. Inc.	513-922-3133
OH	Columbus, Kahsar Sls. Inc.	614-252-4009
OH	Mentor, Kahsar Sls. Inc.	216-946-7659
OR	Portland, S P S Elctrns.	503-297-6919
PA	Exton, Jack McCoy, Inc.	215-363-0350
TN	Knoxville, Cartwright & Bean, Inc.	615-693-7450
TN	Memphis, Cartwright & Bean, Inc.	901-362-8345
TX	Austin, Mil-Rep Assocs., Inc.	512-346-6331
TX	Houston, Mil-Rep Assocs., Inc.	713-444-2557
TX	Richardson, Mil-Rep Assocs., Inc.	214-644-6731
UT	Salt Lake City, Charles Fields & Assocs.	801-531-6177
WA	Redmond, S P S Elctrns.	206-885-5257
WV	Oak Hill, Burl Burgess & Assocs.	304-465-0742
WI	Milwaukee, Beta Technlg. Sls., Inc.	414-543-6609
PR	Guaynabo, ISLA Caribe Electro Sls.	809-720-4430
Can	Markham, Ont., Avotronics, Ltd.	416-475-2024
Can	Mississauga, Ont., R-Theta, Inc.	416-890-0221
Can	Ottawa, Ont., Avotronics, Ltd.	613-233-5527
Can	Pointe Claire, Que., Avotronics, Ltd.	514-697-2135

Local Distributors

AL	Huntsville, Century Fasteners Corp.	205-883-5344
AL	Huntsville, Hammond Elctrns. Inc.	205-830-4764
AZ	Phoenix, Aero-Space Southwest Inc.	602-582-2779
AZ	Tempe, Acacia/VWR Elctrns.	602-894-2874
AZ	Tempe, D C Elctrns. Supp.	602-438-1234
AR	Ft. Smith, Carlton-Bates Co., Inc.	501-646-8201
AR	Little Rock, Carlton-Bates Co. Inc.	501-562-9100
AR	Pine Bluff, Carlton-Bates Co. Inc.	501-535-1355
AR	Springdale, Carlton-Bates Co. Inc.	501-756-5012
CA	Anaheim, A-Z Elctrns.	714-632-1620
CA	Fountain Valley, Comps. Cen. Inc.	714-979-0433
CA	Fullerton, Pyramid Elctrns.	213-691-0561
CA	Garden Grove, Allied Elctrns.	714-554-0731
CA	Hayward, Allied Elctrns.	415-487-5250
CA	Irvine, Acacia/VWR Elctrns.	714-660-0834
CA	Manhatten Bch., Prime Electro	213-379-3642
CA	Mtn. View, Energy Sls. Inc.	415-969-0800
CA	Rancho Cordova, Acacia/VWR Elctrns.	916-638-1861
CA	San Diego, Acacia/VWR Elctrns.	619-565-4365
CA	San Diego, Sigma Elctrns.	619-565-2000
CA	San Jose, Allied Elctrns.	408-727-1690
CA	San Jose, Future Elctrns. Inc.	408-435-9100
CA	Santa Clara, Comps. Cen.	408-988-3751
CA	Santa Clara, D C Elctrns. Supp.	408-980-1199
CA	Santa Clara, Pyramid Elctrns.	408-727-9810
CA	Santa Monica, Master Distrs.	213-452-1229
CA	Sunnyvale, Acacia/VWR Elctrns.	408-745-7200
CA	Tustin, Added Value Elctrn.	714-259-8258
CO	Englewood, N E P Elctrns. Inc.	303-799-9898
CO	Lakewood, Acacia/VWR Elctrns.	303-232-2882
CO	Westminster, Future Elctrns. Inc.	303-650-0123
CT	Danbury, Future Elctrns. Inc.	203-743-9594
CT	E. Haven, J V Elctrns. Co. Inc.	203-469-2321
CT	Wallingford, Cronin Elctrns., Inc.	800-982-4449
FL	Clearwater, Elctrn. Precepts of FL	813-530-9781
FL	Clearwater, Future Elctrns. Inc.	813-441-4771
FL	Ft. Lauderdale, Allied Elctrns.	305-486-0500
FL	Ft. Lauderdale, Hammond Elctrns. Inc.	305-973-7103
FL	Lake Mary, Elctrn./Fasteners	305-321-4000
FL	Largo, Bell Inds.	813-541-4434
FL	Orlando, Hammond Elctrns. Inc.	305-849-6060
FL	Tampa, Century Fasteners Corp.	813-886-5770
GA	Decatur, Allied Elctrns.	404-377-3555
GA	Norcross, Atlanta Hardware Special	404-449-3000
GA	Norcross, Future Elctrns. Inc.	404-441-7675
GA	Norcross, Hammond Elctrns. Inc.	404-449-1996
IL	Chicago, N E P Elctrns. Inc.	312-625-8400
IL	Elgin, Allied Elctrns.	312-697-8200
IL	Lisle, Comps. Inc.	312-852-7707
IL	Rosemont, Advent Elctrns. Inc.	312-297-6200
IL	Schaumburg, Future Elctrns. Inc.	312-882-1255
IN	Indianapolis, Bell Inds.	317-634-8202
IN	Indianapolis, Bell Inds.;Jit Div.	317-299-5487
IN	Indianapolis, Mar Elctrns. Inc.	317-633-6699
IA	Cedar Rapids, Advent Elctrns. Inc.	319-363-0221
MD	Columbia, Future Elctrns. Inc.	301-995-1222
MD	Jessup, Treeko Sls. Inc.	301-470-3300
MD	Marlow Hgts., Allied Elctrns.	301-423-0161
MA	Canton, E P C Elctrns.	617-821-2111
MA	Marlborough, Hardware Specialty Co. Inc.	617-481-8622

MA Needham, Cronin Elctrns., Inc. 617-449-5000
MA Westborough, Future Elctrns. Inc. 617-366-2400
MA Wilmington, Allied Elctrns. 617-942-0150
MA Woburn, Macbearing Co. 617-933-2110
MI Farmington Hills, Advent Elctrns. Inc. .. 313-477-1650
MN Bloomington, Bergquist Co. 612-835-2322
MN Minneapolis, Aero-Space Computer Supp. 612-884-4725
MN St. Paul, Chris Elctrns. 612-631-2647
MO St. Charles, Finnigan Elctrns. 314-946-6201
MO St. Louis, Ric-Tronics 314-576-9816
NH Hampstead, A E I 603-329-5656
NH Salem, Cronin Elctrns., Inc. 603-898-4440
NJ Frenchtown, Sintec Co. 201-996-4093
NJ Mt. Laurel, Future Elctrns. Inc. 609-778-7600
NJ Springfield, Route Elctrns. 201-379-7710
NY Bohemia, Car-Lac Elctrns. 516-567-4200
NY Buffalo, Summit Distrs. inc. 716-887-2800
NY Elmhurst, Century Fasteners Corp. 718-446-5000
NY Holtsville, Tower Fasteners 516-289-8800
NY Liverpool, Future Elctrns. Inc. 315-451-2371
NY Mineola, Allied Elctrns. 516-248-2360
NY Mt. Vernon, Q A R Indl. Elec. 914-699-2224
NY Rochester, Masline Elctrns. Inc. 716-546-5373
NY Rochester, Summit Elctrns. Inc. 716-334-8110
NC Charlotte, Century Fasteners Corp. ... 704-554-0444
NC Greensboro, Golden Elctrns. 919-294-4653
NC Greensboro, Hammond Elctrns. Inc. ... 919-275-6391
NC Raleigh, Century Elctrn. Comps. 919-782-2116
NC Raleigh, Century Fasteners Corp. 919-787-1800
NC Winston-Salem, Kirkman Elctrns. 919-722-9131
OH Cincinnati, Schuster Elctrns. 513-489-1400
OH Twinsburg, Schuster Elctrns. 216-425-8134
OH Warren, REM Elctrns. 216-373-1300
OK Tulsa, Carlton-Bates Co. Inc. 918-250-1626
OR Beaverton, Acacia/VWR Elctrns. 503-646-3377
OR Beaverton, Comp. Resources 503-641-8488
OR Beaverton, Future Elctrns. Inc. 503-626-2977
OR Beaverton, Murphy Elctrns. 503-642-2001
OR Portland, Dunn Elctrns. 503-285-0214
PA Carisle, Cumberland Elctrns. 717-243-8006
PA Erie, REM Elctrns. 814-453-5626
PA Harrisburg, Cumberland Elctrns. 717-232-5999
PA Lancaster, Cumberland Elctrns. 717-393-8304
PA Lewistown, Cumberland Elctrns. 717-249-9631
PA Norristown, Century Elctrn. Comp. 215-631-5400
PA Philadelphia, P E I-Genesis 800-523-0727
PA Philadelphia, Shap Elctrns. 215-969-3300
PA York, Cumberland Elctrns. 717-845-8791
SC Greenville, Hammond Elctrns. Inc. 803-233-4121
SC W. Columbia, Century Fasteners Corp. 803-791-1800
TN Memphis, Carlton-Bates Co. Inc. 901-365-3539
TN Nashville, Carlton-Bates Co. Inc. 615-244-3562
TX Austin, Wofford Elctrns., Inc. 512-339-1131
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Houston, Wofford Elctrns., Inc. 713-847-3583
TX Richardson, Comps. Cen. Inc. 214-664-3444
TX Texarkana, Carlton-Bates Co. Inc. 214-792-6923
UT Salt Lake City, Future Elctrns. Inc. 801-972-8489
VA Richmond, Century Fasteners Corp. .. 804-262-8671
WA Bellevue, Future Elctrns. Inc. 206-881-8199
WA Kent, Pyramid Elctrns. 206-872-5800
WA Redmond, Comp. Resources 800-547-6523
WA Redmond, Energy Sls. Inc. 206-883-2342
WA Redmond, Murphy Elctrns. 206-881-1234
WA Seattle, Allied Elctrns. 206-547-2827
WI New Berlin, N E P Elctrns. Inc. 414-785-9100
Can Calgary, Alberta, Future Elctrns. Inc. ... 403-259-6408
Can Downview, Ont., Future Elctrns. Inc. ... 416-638-4771
Can Edmonton, Alberta, Future Elctrns. Inc. 403-438-2858
Can Mississauga, Ont., Prelco 416-678-0401
Can Mississauga, Ont., Rush Elctrns. 416-677-7280
Can Montreal, Que., Prelco 514-389-8051
Can Nepean, Ont., Carsten Elctrns. Ltd. 613-726-9250
Can Ottawa, Ont., Future Elctrns. 613-820-8313
Can Pointe Claire, Que., Future Elctrns. Inc. 514-694-7710
Can Scarborough, Ont., Carsten Elctrns. Ltd. 416-495-9999
Can St. Laurent, Que., Carsten Elctrns. 514-334-8321
Can Vancouver, BC, Future Elctrns. Inc. 604-294-1166
Can Victoria, BC, Queale Elctrns. Ltd. 604-388-6111
Can Winnipeg, Manitoba, Future Elctrns. Inc. 204-339-0554

FAX: 201-526-6866

ABACUS CONTROLS INC., 89 Readington Rd., Somerville, NJ 08876, Tel: 201-526-6010, TELEX: 888186 ABACUS CONT UD; FSC No.: 54241; Empl.: 45; *Sls. Mgr.:* L. Albrecht ..... **D•2159-2161**

Local Sales Offices & Reps
AL Huntsville, Scientific Dvcs. 205-536-1969
CA Los Angeles, Power Partners 800-468-5400
CA San Diego, Power Partners 800-468-5400
CA Santa Clara, Source Tronics 408-988-8801,
CT New London, Elctrn. Sls. of New England 203-443-2646
FL Ft. Walton Beach, Scientific Dvcs. 904-651-4407
FL Orlando, Scientific Dvcs. 305-841-8180
GA Atlanta, Scientific Dvcs. 205-536-1969
GA Savannah, Scientific Dvcs. 904-651-4407
MA Wareham, Elctrn. Sls. of New England 617-295-7634
MO St. Louis, AME Sls. 314-962-9771,
NC Winston-Salem, Scientific Dvcs. 919-765-5776
TX Dallas, True Techn. 214-691-7870
EXP New York, NY, XPort Trading Co. 212-466-4204,

ABALON PRECISION MFG., 1040 Home Street, Bronx, NY 10459, Tel: 212-589-5682, FAX: 212-589-0300; Empl.: 25; *Sls. Mgr.:* Norman C. Orent

ABB METRAWATT, 2150 W. 6th Ave. Unit J, Broomfield, CO 80020, Tel: 303-469-5231, 800-821-6327, TELEX: 4970869, FAX: 303-469-4256; Empl.: 20; *Sls. Mgr.:* Brad Seavoy

ABB SEMICONDUCTOR, ASEA Brown Boveri, 2150 W. 6th Ave., Broomfield, CO 80020, Tel: 303-469-1883, TELEX: 299745, FAX: 303-469-8394; FSC No.: 4800; Empl.: 18; *Sls. Mgr.:* Mike Melvin; *Dist. Mgr.:* Dave Whitcomb

Abbott TECHNOLOGIES INC

FAX: 818-954-9305

ABBOTT TECHNOLOGIES, INC., Burbank Division, Transformers, 639 So. Glenwood Pl, Burbank, CA 91506, Tel: 818-841-3630, TELEX: 69-6282; FSC No.: 58910; Empl.: 50; *Sls. Mgr.:* Frank S. Goitz ..... **A•2219-2230; D•1563-1571, 2162-2163**

Local Sales Offices & Reps
FL Altamonte Springs, Gugel Assocs. Inc. 305-788-0845
IN Indianapolis, JFCO, Inc. 317-576-9363
MI Grand Rapids, JFCO, Inc. 616-949-1020
NJ Palisades Pk., Abbott Technlgs., Inc. .. 201-461-4005
OH Vandalia, JFCO, Inc. 513-890-8322
PA Pittsburgh, JFCO, Inc. 412-823-5400
TN Nashville, Mil-Spec Sls. Co. 615-367-2427
TX Richardson, Abbott Transistor Labs. .. 214-437-0697
Can Rexdale, Ontario, Source Elctrns., Ltd. 416-676-0830

ABBOTT TECHNOLOGIES, INC., Sun Valley Division, Power Supplies, 8203 Vineland Ave., Sun Valley, CA 91352, Tel: 818-841-3630, TELEX: 75-2972, FAX: 818-954-9305; Empl.: 50; *Sls. Mgr.:* Frank Goitz ..... **D•1563-1571, 2162-2163**

Local Sales Offices & Reps
MO Kansas City, Abrams & Assocs. 314-569-0447
NJ Palisades Pk., Abbott Technlgs., Inc. .. 201-461-4005
TX Richardson, Abbott Technlgs, Inc. 214-437-0697

abbott

FAX: 213-939-1995

ABBOTT TRANSISTOR LABS, Power Supplies, 2727 S. La Cienega Blvd., Los Angeles, CA 90034, Tel: 213-936-8185, TELEX: 69-1398; FSC No.: 15755; Empl.: 500; *Sls. Mgr.:* Mike Brown ..... **D•1545-1562**

Local Sales Offices & Reps
CA Mtn. View, Martinez & Assocs. 415-966-1012
NJ Ft. Lee, Abbott Transistor Labs. 201-461-4411
TX Richardson, Abbott Transistor Labs. .. 214-437-0697
UT Bountiful, Anderson & Assocs. 801-292-8991
WA Bellevue, Comtec 206-453-1188
Can Ottawa, Subtec Ltd. 613-738-1470

ABLE RATED™

FAX: 914-962-2296

ABL ELECTRONICS SUPPLY, INC., 1736 Front St., Yorktown Hgts., NY 10598, Tel: 914-962-2253; Empl.: 18; *Sls. Mgr.:* George Wiesel ..... **C•1308, 1760-1762**

ABLESTIK LABORATORIES, 833 W. 182nd St., Gardena, CA 90248, Tel: 213-532-9341, TWX: 910-346-7606, FAX: 213-516-9417; FSC No.: 21109; Empl.: 150; *Sls. Mgr.:* D. W. Lefever

ABORN ELECTRONICS INC., 2108 D Bering Dr., San Jose, CA 95131, Tel: 408-436-5444, TELEX: 184817 MSGSNDR, FAX: 408-287-4535; FSC No.: 8Z441; Empl.: K. Bomin; *Sls. Mgr.:* V. Lumba

ABRAMS INSTRUMENT CORP., 2859 W. Jolly Rd., Okemos, MI 48864, Tel: 517-332-6405, TWX: 810-251-0785; FSC No.: 00048; *Sls. Mgr.:* Merlyn Gates

ACC ELECTRONICS COMPANY, Echlin Inc., 1300 W. Oak, Independence, KS 67301, Tel: 316-331-1000, TELEX: 436482, FAX: 316-331-1422; Empl.: 1000; *Sls. Mgr.:* Leon Allen ..... **A•1736**

ACCEL INDUSTRIAL HEAT SINK CORP., 3709 Medford St., Los Angeles, CA 90063, Tel: 213-261-5156, FAX: 213-261-5159; FSC No.: 26701; *Sls. Mgr.:* James Bergen

ACCEL TECHNOLOGIES, INC., 7358 Trade St., San Diego, CA 92121, Tel: 619-695-2000, TELEX: 201-582 ATI UR, FAX: 619-695-6527; Empl.: 25; *Sls. Mgr.:* Ray Schnorr

ACCU DATA, INC., 1331 S. State, Provo, UT 84606, Tel: 801-377-9156; Empl.: 10; *Sls. Mgr.:* Ralph D. Bradley; *Dist. Mgr.:* Ralph D. Bradley

ACCUDYNE CORP., P.O. Box 1429, Janesville, WI 53547, Tel: 608-752-9081; FSC No.: 18356; Empl.: 540; *Sls. Mgr.:* R. E. Mowris; *Dist. Mgr.:* R. E. Mowris

ACCUGRAPH CORP., 50 Gervais Drive, Suite 204, Don Mills, ONT, Canada M3C 1Z3, Tel: 416-441-2211, TELEX: 06-986973, FAX: 416 441-2228; Empl.: 155; *Sls. Mgr.:* Dennis Kukulsky; *Dist. Mgr.:* Dennis Kukulsky

ACCULEX CORPORATION, MetraByte, 440 Myles Standish Blvd., Taunton, MA 02780, Tel: 508-880-3660, TELEX: 240713; *Sls. Mgr.:* Brian Smothers .... **D•1378**

ACCUMET ENGINEERING, 518 Main St., Hudson, MA 01749, Tel: 508-568-8311, FAX: 508-562-4384; *Sls. Mgr.:* C. T. Haering

Local Sales Offices & Reps
MD Pasadena, Spectro-Lambda 301-437-7633
NJ Clarksburg, Micro-Lambda 609-259-0400
NY Huntington, Compar New York 516-423-5660
TX Dallas, C & J Assocs. 214-931-6693

ACCUPROBE, INC., 1 Harrison Ave, Box 1044, Salem, MA 01970, Tel: 617-745-7878, TELEX: 882194 Accuprobe UD, FAX: 617-745-7922; Empl.: 26; *Sls. Mgr.:* Thomas H. Murphy; *Dist. Mgr.:* T. H. Murphy

ACCURATE ELECTRONICS, 169 S. Abbe Rd., P.O. Box 1287, Elyria, OH 44036, Tel: 216-366-6330, TELEX: 469705, FAX: 216-366-0522; FSC No.: 11375; Empl.: 35; *Sls. Mgr.:* J. F. Seybold

ACCURIDE, 12311 Shoemaker, Santa Fe Springs, CA 90670, Tel: 213-903-0373, TWX: 910-586-1632, FAX: 213-903-0208; *Sls. Mgr.:* Jackie Pinto

ACCUSONIC DIVISION, Ferranti O.R.E. Inc., Box 709, Falmouth, MA 02541, Tel: 617-548-5800, TELEX: 6817399 OREFAL UW; Empl.: 125; *Sls. Mgr.:* Robert Beede

ACCUSONIC SYSTEMS CORP., Designatronics, Inc., 2101 Jericho Turnpike, New Hyde Park, NY 11040, Tel: 516-328-3300; Empl.: 15 (This Subsidiary); *Sls. Mgr.:* Dennis Goodman

ACCUTRONICS/CONNOR-WINFIELD, See Connor-Winfield

acdc electronics

FAX: 619-439-4243

ACDC ELECTRONICS, Div. of Emerson, 401 Jones Rd., Oceanside, CA 92054, Tel: 619-757-1880, TWX: 910-322-1470; Empl.: 750; *Sls. Mgr.:* Mike Kirkowski; *Dist. Mgr.:* Ray Brown ..... **D•1572-1578**

Local Sales Offices & Reps

IA	Davenport, Rush & West	319-388-9494
CA	Los Angeles, ACDC	818-848-9252
CA	Oceanside, ACDC	619-439-4200
CA	Santa Clara, ACDC Elctrns.	408-727-1627
CO	Colorado Springs, Omega Ltd.	719-598-6845
CO	Englewood, Omega Ltd.	203-762-1921
MD	Columbia, Delta III Assocs.	301-730-4700
FL	Satellite Beach, ACDC Elctrns.	407-773-8692
IL	Elk Grove VL, Tri Star Grp.	312-593-0200
IL	Naperville, ACDC Elctrns.	312-355-8444
IN	Indianapolis, Leslie M. Devoe Co.	317-842-3245
KS	Olathe, Rush & West	913-764-2700
MA	Sudbury, ACDC Elctrns.	508-443-9903
MI	Oak Park, A. Blumenburg, Inc.	313-968-3230
MN	Eden Prairie, Electronic Innovators	612-941-0830
MO	St. Louis, Rush & West	314-965-3322
NY	Central Islip, ACDC	516-348-7710
NY	E. Rochester, Tri-Tech	716-385-6500
NY	Endwell, Tri-Tech	607-754-1094
NY	Fayetteville, Tri-Tech	315-446-2881
NY	Fishkill, Tri-Tech	914-897-5611
OH	Dayton, Lyons Corp.	513-278-0714
OH	Richfield, Lyons Corp.	216-659-9224
OH	Westerville, Lyons Corp.	614-895-1447
OK	Bixby, MGR Elctrns.	918-369-5186
OR	Beaverton, Earl & Brown	503-643-5500
PA	Willow Grove, Tech. Sls.	215-784-0170
WI	Brookfield, Tri-Star Grp.	414-782-2670
TX	Dallas, MGR ELctrns.	214-238-5246
VA	Midlothian, Delta III Assocs.	804-379-1816
NC	Raleigh, R.W. Mitscher Co.	919-848-0941
WA	Redmond, Earl & Brown	206-885-5064

Local Distributors

CO	Englewood, Displays Plus	303-779-8053
FL	Melbourne, Component Distrs.	305-724-9900
GA	Norcross, Applied Power	404-263-0421
IL	Bensenville, Goold Elctrns.	312-860-7171
IL	Bensenville, Magnuson Elctrns.	312-595-7575
IN	Indianapolis, Mar Elctrns.	317-633-6699
IN	Indianapolis, Custom Svc. Elec.	317-879-9119
MA	Needham, Cronin Elctrns.	617-449-5000
MA	Peabody, Time Elctrns.	508-532-9701
MI	Madison Hgts., McNaughton-McKay	313-399-7500
NY	Hauppauge, Sager Elctrns.	516-348-1300
NY	Rochester, Simcona	718-328-3230
OH	Cincinnati, Hughes Peters, Inc.	513-351-2000
OH	Columbus, Hughes Peters, Inc.	614-294-5351
WI	Mequon, Taylor Elec.	414-241-4321
PA	Philadelphia, PEI Genesis	215-673-0400
TX	Dallas, Norvell Elctrns.	214-233-0020
WI	Oshkosh, Electronic Inds.	414-235-8930
WA	Redmond, Priebe Elctrns.	206-881-0508

ACD-ELCOR PRODUCTS, P.O. Box 244, Bethel, CT 06801, Tel: 203-743-3510; Empl.: 3

ACHESON COLLOIDS, Div. of Acheson Industries, Inc., P.O. Box 611747, Port Huron, MI 48061-1747, Tel: 313-984-5581, TWX: 810-231-5265, FAX: 313-984-1446; Empl.: 200

A.C. INTERFACE INC., 15560 Rockfield, Unit 1E, Irvine, CA 92718, Tel: 714-472-9524, TELEX: 655-328; FSC No.: OAP 78; Empl.: 23; *Sls. Mgr.:* Bill Roth; *Dist. Mgr.:* Ray Ponkey

ACL INC., 1960 E. Devon Ave., Elk Grove, IL 60007, Tel: 312-981-9212, 800-STATIC-0, TELEX: 4330251, FAX: 312-981-9278; Empl.: 12; *Sls. Mgr.:* Ralph D. Considine

Local Sales Offices & Reps

AK	Anchorage, VWR Sci.	907-274-6616
AZ	Phoenix, More Sls. Inc.	602-788-9181
CA	Los Angeles, Diversitech	714-240-7720
CA	San Diego, VWR Sci.	619-297-4851
CA	San Francisco, VWR Sci.	415-467-4100
CA	San Jose, Devtec Elctrns. Inc.	408-295-2005
CO	Denver, JBR Mktg. Svcs.	303-451-5338
CO	Denver, VWR Sci.	303-371-0970
FL	Miami, VWR Sci.	305-625-7181
GA	Atlanta, EMI Mktg. Force	404-948-6023
HI	Honolulu, VWR Sci.	808-836-1361
IL	Batavia, VWR Sci.	800-932-5000
IL	Chicago, Restronics of IL	312-437-7707
LA	New Orleans, VWR Sci.	504-733-4181
MA	Shirley, May Assocs.	508-425-9157
OH	Dayton, Shamrock Elctrn. Sls.	513-258-1227
MN	Edina, Restronics Co., Inc.	612-941-9135
MO	Liberty, Lectro Reps, Inc.	816-781-2522
NJ	Bridgeport, VWR Sci.	609-467-3333
NM	Los Alamos, VWR Sci.	505-662-5558
NJ	Norwood, Wilson Inds.	201-767-7060
NY	Vestal, Advancetech Prods.	607-785-0050
OR	Portland, Carr & Assocs.	503-636-7402
TX	Dallas, Kruvand Assocs.	214-437-3355
TX	Dallas, VWR Sci.	713-641-0681
UT	Salt Lake City, VWR Sci.	801-972-6400
WA	Seattle, Carr & Assocs.	206-839-6334
FL	Windermere, Thomas & Assocs.	407-948-6023

ACME DIVISION, Allied Products Corporation, P.O. Box 1404, New Haven, CT 06505, Tel: 203-562-2171, TELEX: 295503 Acme UR; Empl.: 75; *Sls. Mgr.:* Marvin Leonard

Acme Electric Electronic Distribution

FAX: 716-968-3948

ACME ELECTRIC CORPORATION, 20 Water Street, Cuba, NY 14727, Tel: 716-968-2400; *Sls. Mgr.:* Bill Bengle; *Dist. Mgr.:* Donald Chesner ..... **D•1580-1583**

Local Sales Offices & Reps

AL	Huntsville, Cartwright & Bean	205-830-1540
AZ	Phoenix, O'Donnell Assocs. S.W.	602-944-9542
CA	San Jose, O'Donnell Assocs., North	408-432-1940
CO	Englewood, Harthun Assocs.	303-792-5050
FL	Deerfield Bch., Cartwright & Bean	305-429-3400
FL	Orlando, Cartwright & Bean	407-422-4531
GA	Norcross, Cartwright & Bean	404-368-0160
IL	Des Plaines, Electron Mktg.	312-298-2330
IN	Ft. Wayne, Needler Sls. Co., Inc.	219-447-2123
IN	Indianapolis, Luebbe Sls.	317-845-7389
IN	Indianapolis, Needler Sls. Co., Inc.	317-255-8056
KS	Shawnee Mission, Lowell Kangas & Assocs.	913-631-3515
LA	Covington, Cartwright & Bean	504-892-1780
MD	Gaithersburg, Naudain Assocs.	301-258-5040
MA	Framingham, Marathon Sls.	508-875-3566
MI	Jackson, Cartwright & Bean	601-981-1170
MI	Livonia, Luebbe Sls.	313-489-8828
MN	Minneapolis, Boerger & Assocs.	612-560-3435
MO	St. Louis, Lowell Kangas & Assocs.	314-821-4050
NJ	Matawan, Shepard & Assocs.	201-566-0095
NM	Albuquerque, O'Donnell Assocs. S.W.	505-889-4522
NY	E. Syracuse, Ossmann & Assocs.	315-437-7052
NY	Henrietta, Ossmann & Assocs.	716-359-1200
NC	Charlotte, Cartwright & Bean	704-536-0303
NC	Lumberton, Acme Elec. Corp.	919-738-9202
NC	Raleigh, Cartwright & Bean	919-876-4130
OH	Cincinnati, Luebbe Sls.	513-530-0600
OH	Cleveland, Luebbe Sls.	216-333-0425
OH	Cleveland, Marlow Assocs.	216-991-6500
OH	Columbus, Luebbe Sls.	614-431-0474
OH	Dayton, Luebbe Sls.	513-294-0426
OH	Dayton, Marlow Assocs.	513-274-9666
OK	Tulsa, Milco Mktg.	918-664-2277
OR	Beaverton, Pacific Specialists	503-641-9373
PA	Pittsburgh, Luebbe Sls.	412-364-0490
PA	Pittsburgh, Marlow Assocs.	412-343-5050
PA	Prospect Pk., Elf Sls. Co.	215-534-3340
TN	Memphis, Cartwright & Bean	901-362-8345
TX	Austin, Milco Mktg.	512-251-9918
TX	Houston, Milco Mktg.	713-723-5037
TX	Richardson, Milco Mktg.	214-783-2716
UT	Salt Lake City, Acme Elec. Corp.	801-539-0227
WA	Redmond, Pacific Mktg. Specialists	206-882-3144
WI	Waukesha, Electron Mktg.	414-547-1505

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AL	Decatur, Forbes Distbg.	205-353-4762
AL	Huntsville, Allied Elctrns.	205-721-3500
AL	Huntsville, Arrow Elctrns.	205-837-6955
AL	Huntsville, Forbes Distbg.	205-837-1579
AL	Mobile, Forbes Distbg.	205-479-4535
AZ	Phoenix, Arrow Elctrns.	602-437-0750
AZ	Phoenix, Cetec/Future	602-272-7951
CA	Chatsworth, Allied Elctrns.	818-701-7500
CA	Chatsworth, Cetec/Future	818-700-0914
CA	Fremont, Allied Elctrns.	415-770-0590
CA	Irvine, Cetec/Future	714-250-4141
CA	Los Angeles, Arrow Elctrns.	818-701-7500
CA	Menlo Pk., Casey Johnston	415-328-6892
CA	San Diego, Allied Elctrns.	619-565-4800
CA	San Diego, Arrow Elctrns.	619-565-4800
CA	San Diego, Cetec/Future	619-278-5020
CA	San Jose, Cetec/Future	408-434-1114
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CA	San Jose, Rose Elctrns.	408-263-9700
CA	Santa Ana, ITT Multicomp.	714-835-9019
CA	Santa Monica, Transworld Trade	213-476-8406
CA	Sunnyvale, Arrow Elctrns.	408-745-6600
CA	Tustin, Allied Elctrns.	714-669-4190
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CO	Englewood, Arrow Elctrns.	303-790-4444
CO	Englewood, NEP Elctrns.	303-799-9898
CT	Wallingford, Arrow Elctrns.	203-265-7741
FL	Altamonte Springs, Arrow Elctrns.	305-682-6923
FL	Clearwater, Allied Elctrns.	813-539-0369
FL	Deerfield Bch., Arrow Elctrns.	305-429-8200
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FL	Ft. Lauderdale, Hammond Elctrns.	305-973-7103
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FL	Lantana, Sylvia Prods.	305-482-5295
FL	Orlando, EMSCO	305-849-6362
FL	Orlando, Hammond Elctrns.	305-849-6060
FL	Palm Bay, Arrow Elctrns.	305-725-1480
FL	Pompano Bch., Allied Elctrns.	305-978-3008
FL	Tampa, Hammond/EMSCO	813-253-2684
GA	Doraville, Voltex Batteries	404-448-6021
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GA	Norcross, Allied Elctrns.	404-446-8585
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GA	Norcross, Hammond Elctrns.	404-449-1996
IL	Addison, LComp Elctrns.	312-628-1400
IL	Chicago, NEP Elctrns.	312-625-8400
IL	Elgin, Allied Elctrns.	312-697-8200
IL	Itasca, Arrow Elctrns.	312-250-0500
IN	Ft. Wayne, Bell Inds.	219-423-3422
IN	Indianapolis, Advent Elctrns.	317-872-4910
IN	Indianapolis, Arrow Elctrns.	317-243-9353
IN	Indianapolis, Bell Inds.	317-875-8200
IA	Cedar Rapids, Arrow Elctrns.	319-395-7230
IA	Cedar Rapids, Iowa Radio Supp.	319-393-4510
KS	Lenexa, Arrow Elctrns.	913-541-9542
KS	Wichita, Radio, Inc.	316-264-2798
KY	Florence, URI Elctrns.	606-371-4423
KY	Lexington, Radio Elctrn.	606-255-6661
KY	Louisville, Peerless Elctrns.	502-637-7674
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MI Ann Arbor, Arrow Elctrns. 313-971-8220
MI Ann Arbor, Bell Inds. 313-971-9093
MI Farmington Hills, Advent Elctrns. 313-477-1650
MI Ferndale, RAM Meter, Inc. 313-398-6767
MI Grand Rapids, Arrow Elctrns. 616-243-0912
MI Grand Rapids, R S Elctrns. 616-241-3483
MI Livonia, Allied Elctrns. 800-433-5700
MI Livonia, R S Elctrns. 313-525-1155
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MN Edina, Arrow Elctrns. 612-830-1800
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MO Kansas City, LComp Elctrns. 816-221-2400
MO Maryland Hgts., Chelsea Inds. 314-997-9700
MO Maryland Hgts., LComp Elctrns. 314-291-3563
MO Montgomery, Forbes Distbg. 205-263-2083
MO St. Louis, Arrow Elctrns. 314-567-6888
MO St. Louis, Vansickle Elctrns. 314-621-5000
NH Manchester, Arrow Elctrns. 603-668-6968
NJ Green Brook, Apparatus Elec. 201-752-8400
NJ Lodi, TRC 201-779-8282
NJ Marlton, Arrow Elctrns. 609-596-8000
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NJ Mt. Laurel, Allied Elctrns. 609-234-7769
NJ Oakland, Relay Specialties 201-337-1000
NJ Parsippany, Arrow Elctrns. 201-538-0900
NM Albuquerque, Arrow Elctrns. 505-243-4566
NY Buffalo, Summit Inds. 716-887-2800
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NY Hauppauge, Sager Elctrl. 516-348-1300
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NY Melville, Arrow Elctrns. 516-391-1300
NY Mineola, Allied Elctrns. 516-248-2360
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NY Rochester, Allied Elctrns. 716-244-9440
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NY Rochester, CAM/RPC Elctrns. 716-427-9999
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NY Ronkonkoma, Arrow Elctrns. 516-467-1000
NY Roslyn Hgts., Micro Connections 516-625-1717
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NC Durham, Southeastern Elctrns. 919-688-8204
NC Fayetteville, Southeastern Elctrns. 919-483-0371
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NC Greensboro, Southeastern Elctrns. 919-273-8675
NC Hickory, Southeastern Elctrns. 704-322-9493
NC Jacksonville, Southeastern Elctrns. 919-353-4171
NC Kingston, Southeastern Elctrns. 919-523-5113
NC Raleigh, Allied Elctrns. 919-876-5845
NC Raleigh, Arrow Elctrns. 919-876-3132
NC Raleigh, Southeastern Elctrns. 919-828-2311
NC Wilmington, Southeastern Elctrns. 919-791-7365
NC Winston-Salem, Arrow Elctrns. 919-725-8711
OH Centersville, Arrow Elctrns. 513-435-5563
OH Cincinnati, Hughes-Peters, Inc. 513-351-2000
OH Cincinnati, R S Elctrns. 513-793-2450
OH Cincinnati, URI Elctrns. 513-761-4030
OH Cleveland, CAM/RPC Elctrns. 216-461-4700
OH Columbus, Arrow Elctrns. 614-436-0928
OH Columbus, Hughes-Peters, Inc. 614-294-5351
OH Dayton, Bell Inds. 513-435-8660
OH Maumee, R S Elctrns. 419-893-0721
OH Solon, Arrow Elctrns. 216-248-3990
OH Warren, REM Elctrns. 216-373-1300
OK Oklahoma City, Radio, Inc. 405-789-0741
OK Tulsa, Altair Co. 918-252-5781
OK Tulsa, Arrow Elctrns. 918-252-7537
OK Tulsa, Radio, Inc. 918-587-9123
OR Beaverton, Arrow Elctrns. 503-645-6456
OR Beaverton, Rose Elctrns. 503-629-9288
OR Tualatin, Moore Elctrns. 503-692-5333
PA Allentown, Yates Battery 215-437-6700
PA Drexel Hill, Kass Elctrns. 215-449-2300
PA Erie, REM Elctrns. 814-453-5626
PA Essington, Tri-Com 215-521-3080
PA Monroeville, Arrow Elctrns. 412-856-7000
PA N. Huntingdon, REM Elctrns. 412-864-7423
PA Pittsburgh, Allied Elctrns. 412-367-4124
PA Pittsburgh, CAM/RPC Elctrns. 412-782-3770
PA Reading, Yates Battery 717-383-0226
PA Trevose, Sager Elctrns. 215-638-7491
SC Greenville, Hammond/EMSCO 803-233-4121
TN Nashville, Carlton Bates Co. 501-562-9100
TX Austin, Allied Elctrns. 512-389-3771
TX Austin, Altair Co. 512-837-4970
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TX Carrollton, Arrow Elctrns. 214-380-6464
TX Corpus Christi, Douglas Elctrns. 512-883-5103
TX Dallas, Allied Elctrns. 214-553-4370
TX El Paso, Era Elctrns. 915-592-4126
TX Ft. Worth, Allied Elctrns. 817-336-5401, 800-433-5700
TX Houston, Altair Co. 713-462-3029
TX Houston, Arrow Elctrns. 713-530-4700
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UT Salt Lake City, Arrow Elctrns. 801-973-6913
VA Roanoke, Southeastern Elctrns. 703-344-661
WA Kent, Arrow Elctrns. 206-575-4420
WA Seattle, Allied Elctrns. 206-547-2827
WI Brookfield, Arrow Elctrns. 414-792-0150
WI Mequon, Taylor Elctrns. 414-241-4321
WI New Berlin, Allied Elctrns. 414-796-1280
WI New Berlin, NEP Elctrns. 414-785-9100
EXP NY/Farmingdale, Arrow Export 516-293-6363
PR Hato Rey, Arrow Elctrns. 809-764-4384
Can Burnaby, BC, Arrow Elctrns. 1-800-268-6935
Can Concord, Ont., ITT Multicomp. 416-736-1144
Can Mississauga, Ont., Arrow Elctrns. 416-672-7769
Can Montreal, Que., Arrow Elctrns. 514-735-5511
Can Nepean, Ont., Arrow Elctrns. 613-226-6903
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ACME ELEC. HEATING CORP., 4685 E. 11th Ave., Hialeah, FL 33013, Tel: 305-685-8326; Empl.: 12

ACME MODEL ENGINEERING CO., 654 Bergen Blvd, Ridgefield, NJ 07657, Tel: 201-943-7650; Empl.: 29

ACME TRANSFORMER, Acme Electric Corporation, Rte. 4, Box 54, Lumberton, NC 28358, Tel: 919-738-1121, FAX: 919-739-0024; *Sls. Mgr.:* Don Chesner

ACON, INC., 15c Plymouth Dr., South Easton, MA 02375, Tel: 508-230-8022, FAX: 508-230-2371; Empl.: 5 ..... **D•1584-1586**

Local Sales Offices & Reps
CA San Jose, Silicon Valley Sls. 408-432-1967
CT Hamden, Datcom 203-288-7005
MA Waltham, Datcom 617-891-4600
OK Tulsa, Advance Tech. Sls. 918-664-0482
TX Austin, Advance Tech. Sls. 512-331-9979
TX DALLAS, Advance Tech. Sls. 214-340-1300
TX Houston, Advance Tech. Sls. 713-440-3888

ACOPIAN, Box 638, Easton, PA 18044, Tel: 215-258-5441, TWX: 510-651-4919, FAX: 215-258-2842; FSC No.: 14749; *Sls. Mgr.:* T. Skopal ..... **D•1587-1613**

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FL Melbourne, Acopian 407-727-1172
MD Ellicott City, Doss Elctrns. 301-465-1336

ACOUSTIC POWER SYSTEMS, INC., 5731 Palmer Way, Ste. A, Carlsbad, CA 92008, Tel: 619-438-4848, TELEX: 4995113 (SHAKE), FAX: 619-438-8845; Empl.: 5

ACRODYNE CONTROLS, See Accudyne Corp.

ACROMAG INC., 30765 Wixom Rd., Wixom, MI 48096, Tel: 313-624-1541, TELEX: 247354, FAX: 313-624-9234; Empl.: 100; *Sls. Mgr.:* J. Welsand

ACROSYSTEMS CORP., 66 Cherry Hill Dr., Beverly, MA 01915, Tel: 508-927-8880; Empl.: 30; *Sls. Mgr.:* Herbert Tobey

ACS COMMUNICATIONS SYSTEMS, 480 Spring Pk. Pl, Ste. 900, Herndon, VA 22070, Tel: 703-471-0892, TWX: 710-833-0326, FAX: 703-437-9333; FSC No.: 56496; Empl.: 32; *Sls. Mgr.:* Thomas Mitchell, VP

ACTION INSTRUMENTS
...the Industrial I/O Company

FAX: 619-279-6290

ACTION INSTRUMENTS, 8601 Aero Dr., San Diego, CA 92123, Tel: 619-279-5726; Empl.: 230; *Sls. Mgr.:* Keith Rosburg; *Dist. Mgr.:* Mary Hyde ..... **D•1157**

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TX Houston, Regional Office 713-771-9426

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AC TRANSFORMER, 89 Madison St., Newark, NJ 07105, Tel: 201-589-8574; FSC No.: 3677; Empl.: 13; *Sls. Mgr.:* George Giangrande, Sls. Consit.

ACUREX CORP./AUTODATA DIV., 555 Clyde Ave., P.O. Box 7042, Mountain View, CA 94039, Tel: 415-967-9100, TELEX: 34-6391, TWX: 910-379-6593, FAX: 415-967-7727; Empl.: 720; *Sls. Mgr.:* Rudolf Touitou; *Dist. Mgr.:* Rudolf Touitou

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FL DeLeon Springs, Dell-Tech Control Co. 904-985-5530
GA Doraville, Kemp Engrg. 404-452-8050
IL Wheaton, Ray Knitter Assocs., Inc. 312-690-6363
MA Natick, Andruss-Peskin 617-653-3919
OR Gladstone, Calvert Control 503-236-1358
NJ Mt. Laurel, P.D.C. Corp. 609-273-8282
KS Shawnee Mission, Comtel Midwest 913-268-0762
NC Charlotte, Walk/Man Instrs. 704-375-3132
OH Medina, Stress Analysis Svcs. 216-725-7733
OK Stillwater, Acudata 405-743-1886
MN Wayzata, Comtel Midwest 612-476-1551
TX Plano, Acudata 214-424-3567
NM Albuquerque, Hannah Hill 505-292-4098
Can Chomedey Laval, Que., Technolor Instrs., Inc. 514-331-7405

ADAC CORP., 70 Tower Office Pk., Woburn, MA 01801, Tel: 617-935-6668, TELEX: 951802; Empl.: 80; *Sls. Mgr.:* Gerald Feldeisen

ADAGE, INC., 165 Lexington Rd., Billerica, MA 01821, Tel: 508-667-7070, TELEX: 710-347-1594; Empl.: 105; *Sls. Mgr.:* Bruce E. Johnson; *Dist. Mgr.:* N/A

ADALET-PLM DIV, Div. Scott & Fetzer Co., 4801 W. 150th St., Cleveland, OH 44135, Tel: 216-267-9000, TELEX: 98-5349; FSC No.: 73389; Empl.: 177; *Sls. Mgr.:* J. L. Smelko

ADAMS-MAXWELL DIVISION, Coast Magnetics, 1207 North La Brea Ave., Inglewood, CA 90302-1284, Tel: 213-673-3245, TELEX: 686103AMISPACEASA, FAX: 213-673-8828; FSC No.: 22558; Empl.: 60; *Sls. Mgr.:* Dev Dosaj

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ADAMS-RUSSELL ELECTRONICS CO., INC., Haverhill Rd, Amesbury, MA 01913, Tel: 508-388-5210, TWX: 710-347-6360; FSC No.: 11556; Empl.: 400; *Sls. Mgr.:* H. Adjemian

ADAMS-RUSSELL, Anzac Div., 80 Cambridge St, Burlington, MA 01803, Tel: 671-273-3333, TELEX: 200155, TWX: 710-332-0258; FSC No.: 21912; Empl.: 300; *Sls. Mgr.:* Mike Smith

ADAMS-RUSSELL, INC., 10713 Gilroy Rd., Hunt Valley, MD 21030, Tel: 301-771-0077, TELEX: 87442, FAX: 301-771-6025; FSC No.: 29644; *Sls. Mgr.:* Frederick D. Reynolds

ADAPTIVE NETWORKS, P.O. Box 1020 Kendall Sq., Cambridge, MA 02142, Tel: 617-497-5150; Empl.: 20; *Sls. Mgr.:* Michael Liebson; *Dist. Mgr.:* Michael Liebson

ADATEK, INC., 700 Airport Way, Sandpoint, ID 83864, Tel: 208-263-1471, 800-323-3343, TELEX: 62903932, FAX: 208-263-6596; Empl.: 13; *Sls. Mgr.:* Ken Brookings; *Dist. Mgr.:* Suzy Hook

ADCOUR, INC., 18 Billings St., PO Box 277, Sharon, MA 02067, Tel: 617-784-8123, FAX: 617-784-5563; Empl.: 29; *Sls. Mgr.:* William O'Connell; *Dist. Mgr.:* William O'Connell

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ADDITIVE PRODUCTS DIV., Kollmorgen Corp., P.O. Box 700, West La., Aquebogue, NY 11931, Tel: 516-722-4100, FAX: 516-722-4154; Empl.: 500; *Sls. Mgr.:* Lenny Smookler

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ADTECH POWER INC., 1620 S. Sunkist St., Anaheim, CA 92806, Tel: 714-634-9211, TELEX: 68-1498, FAX: 714-634-0802; FSC No.: 56410; Empl.: 70; *Sls. Mgr.:* Stuart B. Morrey; *Dist. Mgr.:* Stuart B. Morrey

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ADVANCE, A Unit of Zero Corporation, 6900 Beck Avenue, N. Hollywood, CA 91605, Tel: 818-983-0333; *Sls. Mgr.:* Kevin Quinn ..... **C•1099**

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AZ	Scottsdale, Casola Assocs.	602-860-5061
AZ	Tempe, HISCO/Arizona	602-968-6171
CA	Carson, Aetna Labs.	213-532-4779
CA	Los Angeles, Landa & Assocs.	213-879-0770
CA	Pleasanton, Moulthrop Sls.	415-463-0450
CA	San Diego, Qualtronics	619-695-0118
CA	Santa Ana, Landa & Assocs.	714-543-7805
CA	Sherman Oaks, Advance Engrg.	818-983-0333
CA	Sunnyvale, Eagle Mktg.	408-736-0448
CO	Aurora, HISCO/Denver	303-341-0411
CO	Golden, J.F. Hurlbut Co.	303-279-7796
CT	New Milford, Ray Perron Co.	203-354-2569
FL	Bradenton, T G & Assocs.	813-753-4158
FL	Hypoluxo, H. J. Leary	305-582-5456
GA	Woodstock, Protech Sys.	404-926-0342
IL	Elk Grove, Restronics	312-437-7707
IL	Elmhurst, FF/Hill-Gray	312-832-4101
IN	Indianapolis, MEI	317-872-5662
MD	Columbia, ARA Elctrns.	301-953-1733
MA	Needham, Ray Perron Co.	617-449-6162
MA	Palmer, Beniot-Senecal	413-283-8343
MN	Minnetonka, Production Autmation N.	612-935-1414
MO	Hazelwood, Stone & Assocs.	314-895-4565
MO	Kansas City, Production Automation S.	816-737-3030
NH	Dover, Ray Perron Co.	603-742-2321
NJ	Livingston, Argo Zeta	201-680-1004
NM	Albuquerque, Shefler/Kahn	505-274-0499
NY	Smithtown, T & K Sls.	516-724-3456
NY	Whitney Point, Tae-Rep ...	607-692-3705/772-6952
OH	Cincinnati, Ken Hoffman Co.	513-931-1621
OH	Kettering, Ken Hoffman Co.	513-299-8448
OR	Beaverton, Evergreen Mktg. Grp.	206-633-3160
PA	West Conshocken, Eastern Comp. Sls. Corp.	215-825-8610
TX	Austin, Barry Sls.	512-837-3616
TX	Bedford, P. R. Zano & Assocs.	214-688-0652
TX	Houston, Barry Sls.	713-784-5860
TX	Richardson, Barry Sls.	214-234-0255
WA	Federal Way, Rick Carr & Assocs.	206-839-6334
WA	Seattle, Evergreen Mktg. Grp.	206-633-3160
WI	Madison, FF/Hill-Gray	608-246-8155
EXP	Rio Pjedras, PR, Elctrn. Sls. Assocs.	809-762-6259

ADVANCE CONVERSION DEVICES CO., 274 S. Salem St., Randolph, NJ 07869, Tel: 201-989-0095; FSC No.: 52298; Empl.: 24; *Sls. Mgr.:* D. J. Fedderly ..... **D•2164-2165**

Local Sales Offices & Reps

AL	Huntsville, Hughes Assocs., Inc.	205-533-9108
AZ	Scotsdale, Dave Menegay & Assocs.	602-994-9519
AR	El Dorado, Kemp Engrg. Co., Inc.	918-663-4501
CA	Campbell, SMA	408-370-6900
CA	Costa Mesa, FLW Inc.	714-751-7512
CO	Denver, Elcom, Inc.	303-337-2300
GA	Norcross, Hughes Assocs., Inc.	404-622-1587
GA	Warner Robins, Hughes Assocs., Inc.	912-477-1889
IA	Des Moines, The Beams Co.	515-255-1148
KS	Shawnee Mission, The Beams Co.	913-631-0200
MD	Elliott City, Dyna-Rep Co.	301-992-4350
MA	Lexington, E. F. Dillon, Inc.	617-862-1118
MI	Ann Arbor, SKM Ashby Assocs., Inc.	313-995-4082
MN	Minneapolis, Integrated Peripherals Sys., Inc.	612-831-0349
MS	Corinth, Hughes Assocs., Inc.	601-287-2915
MO	St. Louis, The Beams Co.	314-434-8448
NJ	Franklin Lakes, Hansen & Hughes Assocs.	201-848-8900
NM	Albuquerque, Brytec Sls. Inc.	505-884-1123
NY	Clinton, Advanced Comps. Corp.	315-853-6438
NY	Greenlawn, Hanson & Hughes Assocs.	516-754-3608
NY	N. Syracuse, Advance Comps.	315-699-2671
NY	Rochester, Advanced Comps. Corp.	716-544-7017
NY	Scottsdale, Advanced Comps. Corp.	716-889-1429
NC	Cary, Hughes Assocs., Inc.	919-467-7029
OH	Cleveland, SKM Ashby Assocs., Inc.	216-461-0826
PA	Evdenheim, Espy Sls. Co.	215-576-0780
TN	Jonesboro, Hughes Assocs.	615-753-2719
TN	Nashville, Hughes Assocs.	615-871-0908
TX	Lewisville, J. Hughes Co.	817-430-1683
TX	Stafford, Jim Hughes Co.	713-343-0673
VA	Alexandria, Dyna-Rep Co.	703-354-1222
EXP	NY/New York, Roburn Agencies, Inc.	212-989-5939

ADVANCED ANALOG, Intech, 2270 Martin Ave., Santa Clara, CA 95050, Tel: 408-988-4930, FAX: 408-988-2702; FSC No.: 52467; Empl.: 150; *Sls. Mgr.:* Michael Sullivan ..... **D•1616**

ADVANCED CIRCUIT TECHNOLOGY, 118 Northeastern Blvd., Nashua, NH 03062, Tel: 603-880-6000, 800-234-FLEX, TWX: 710-228-8961, FAX: 603-880-1785; FSC No.: 57034; Empl.: 185; *Sls. Mgr.:* David Bouley, Dir. of Sls.

ADVANCED COMPONENTS INDS., INC., Spitznagel GmbH, 120 Center Street, El Segundo, CA 90245, Tel: 213-322-4249, TELEX: 5106000379 ACI LSA CA, FAX: 213-322-6661; *Sls. Mgr.:* Irma Spreitzer ..... **A•2248**

Local Sales Offices & Reps

CA	Los Angeles, Power Partners, Inc.	213-215-0800
CA	San Ramon, Tech. Consits.	415-830-0829
CT	Hopkinton, Berkshire Elctrns.	508-435-9356
IL	St. Charles, XYZ Mktg.	312-584-3001
ME	Hopkinton, Berkshire Elctrns.	508-435-9356
MA	Hopkinton, Berkshire Elctrns.	508-435-9356
NH	Hopkinton, Berkshire Elctrns.	508-435-9356
WI	St. Charles, XYZ Mktg.	312-584-3001

ADVANCED CONTROL SYS., 205 Oak Street, Pembroke, MA 02359, Tel: 617-826-4477, FAX: 617-826-9987; Empl.: 8; *Sls. Mgr.:* Leopold Bric ..... **D•1135**

ADVANCED DETECTOR CORP., Applied Solar Energy Corp., 15251 E. Don Julian Rd., Industry, CA 91746, Tel: 818-369-6886, TWX: 910-584-4890, FAX: 818-336-8694; Empl.: 297

ADVANCED ELECTRONIC PACKAGING, 21562 Surveyor Circle, Huntington Beach, CA 92646, Tel: 714-969-1150; *Sls. Mgr.:* Douglas A. Hill

ADVANCED FILTER DEVICES, INC., 6241 Yarrow Dr., Ste. D, Carlsbad, CA 92009, Tel: 619-438-2074, FAX: 619-438-5937; FSC No.: 56620; Empl.: 45; *Sls. Mgr.:* Herbert Johnson

ADVANCED HIGH VOLTAGE CO., P.O. Box 2136, Lancaster, CA 93539, Tel: 805-946-2600; *Sls. Mgr.:* John Richardson ..... **D•1617**

ADVANCED INPUT DEVICES, W. 250 A.I.D. Dr., Coeur d'Alene, ID 83814, Tel: 208-765-8000, TWX: 510-776-0584; FSC No.: 95666; Empl.: 300; *Sls. Mgr.:* Kevin Malone

ADVANCED INTERCONNECTIONS CORP., 5 Energy Way, West Warwick, RI 02893, Tel: 401-823-5200, TWX: 910-240-3454, FAX: 401 823-8723; FSC No.: 05-0394638; *Sls. Mgr.:* Max E. Rice

ADVANCED KINETICS, 1239 Victoria St., Costa Mesa, CA 92627, Tel: 714-646-7165, TELEX: 18-2714, FAX: 714-722-9039; Empl.: 32; *Sls. Mgr.:* Mitch Barker

ADVANCED LINEAR DEVICES, INC., 1180F Miraloma Way, Sunnyvale, CA 94086-4606, Tel: 408-720-8737, TWX: 510-100-6588, FAX: 408-720-8297; Empl.: 10; *Sls. Mgr.:* G. M. O'Neal; *Dist. Mgr.:* G. M. O'Neal

ADVANCED MATERIALS SYSTEMS, See Handy & Harman Electronic Materials Corp.

ADVANCED MICRO DEVICES, P.O. Box 3453, 901 Thompson Pl., Sunnyvale, CA 94088, Tel: 408-732-2400, TELEX: 34-6306, TWX: 910-339-9280, FAX: 408-982-7447; Empl.: 17,000; *Sls. Mgr.:* Steve Zelencik; *Dist. Mgr.:* Al Frugaletti

ADVANCED MICRO SYSTEMS, INC., 31 Flagstone Drive, Hudson, NH 03051, Tel: 603-882-1447, FAX: 603-889-0425; Empl.: 50

ADVANCED POWER PRODUCTS, 1510 Garden St. Ste. 17, Santa Barbara, CA 93101, Tel: 805-965-0042, FAX: 805-684-4400

ADVANCED PRECISION CONTROLS, 409 Calle San Pablo, No. 100, Camarillo, CA 93010, Tel: 805-388-1344, FAX: 805-388-1270; Empl.: 20; *Sls. Mgr.:* Judy Williams; *Dist. Mgr.:* Judy Williams

ADVANCED SYSTEMS CONCEPTS, 2333 N. Lake Ave., Altadena, CA 91001, Tel: 818-791-0983, TELEX: 701 215 ASCI, FAX: 818-791-8347; FSC No.: 6U785; Empl.: 15; *Sls. Mgr.:* Maria Reddix; *Dist. Mgr.:* B. Lee

ADVANCED TECHN. RESEARCH LABS., 5645 K General Washington Dr., Alexandria, VA 22312, Tel: 703-750-2920; FSC No.: 91375; Empl.: 12; *Sls. Mgr.:* Bob Palma, Sr.; *Dist. Mgr.:* Bob Palma, Sr.

ADVANCED THERMAL PRODUCTS, INC., P.O. Box 249, St. Marys, PA 15857, Tel: 814-772-0278, FAX: 814-722-0905; *Sls. Mgr.:* John M. Sidoni

Local Sales Offices & Reps

AL	Huntsville, DHR Mktg.	205-722-0440
GA	Atlanta, DHR Mktg.	404-564-0529
NY	Syracuse, John R. Costello	315-472-0322
NC	Raleigh, DHR Mktg.	919-781-1961
SC	Greenville, DHR Mktg.	803-235-3594
TX	Dallas, Eatman Engineering	214-771-1903
WI	New Berlin, Thomas Labant	414-425-7157

AD-VANCE MAGNETICS, INC., 625 Monroe St., Rochester, IN 46975, Tel: 219-223-3158, TWX: 810-290-0294, FAX: 219-223-2524; FSC No.: 50788; Empl.: 33; *Sls. Mgr.:* Kay Nixon ..... **C•1730**

Local Sales Offices & Reps

AL	Huntsville, Murcota Corp	205-539-8476
CA	El Cajon, ATronix Technlg.	619-444-1501
CA	Los Altos, Frauman Assoc.	415-941-0660
CA	Woodland Hills, ATronix Technlg.	818-703-7212
CO	Englewood, Component Sls. Inc.	303-779-8060
CT	Branford, Abbott-Allison	203-481-0405
FL	Hollywood, Askland Electronic Components	305-987-1974
IL	Westchester, W. G. Brouillette	312-345-6500
NJ	Flanders, K & R Engrg. Sls. Corp.	201-584-5235, 800-631-9362
NC	Winston-Salem, Murcota Corp.	919-722-9445
PA	Stewartstown, Eastern Comps. Sls. Corp.	717-993-6261
PA	W. Conshohocken, Eastern Comps.	215-825-8610
TX	Dallas, J. M. Spell Co. Inc.	214-620-0040
UT	Salt Lake City, Component Sls. Inc.	801-268-8440
VA	Herndon, Eastern Comps.	703-444-1089
VA	Vinton, Eastern Comps. Sls. Corp.	703-344-4756
WA	Bellevue, Caruso & Co.	206-455-8811

ADVANCE POWER SUPPLIES, INC., 32111 Aurora Rd., Solon, OH 44139, Tel: 216-349-0755, FAX: 216-349-0142; Empl.: 6

ADVANCE WIRE & CABLE, The Advance Group, 1661 Industrial Way, Belmont, CA 94002, Tel: 415-592-4550, TELEX: 334475, FAX: 415-593-8859; FSC No.: 57775; Empl.: 158; *Sls. Mgr.:* Ed Mittelbusher; *Dist. Mgr.:* Ed Mittelbusher

Local Sales Offices & Reps

AZ Phoenix, The Advance Grp. 602-437-1334
CA Anaheim, The Advance Grp. 714-870-0300
CA Belmont, The Advance Grp. 415-592-4550
CA Mission Viejo, Robert M. Riell Co. 714-380-8903
CO Lakewood, CDT 303-989-6563
FL Orlando, Gillum Sls. 305-857-2110
FL Tampa, Gillum Sls. 813-531-2248
FL Tampa, Standard Mktg. Inc. 813-933-5833
GA Duluth, DTM Inc. 404-381-5592
IL Deerfield, Flaherty-Haines, Inc. 312-948-7800
ME Worcester, Spec-Tec 617-795-7270
MD Ellicott City, Tech. Sls. Inc. 301-461-2400
MN Minneapolis, TecTeam Sls. Inc. 612-854-6616
NY Commack, JL Sls. Assocs. 516-462-5666
NY Victor, Schumacher, Scruggs & Kirby 716-248-8750
OH Cleveland, JFCO Inc. 216-398-6300
OH Dayton, JFCO 513-890-7251
SC Greer, Advance Wire & Cable 803-877-9600
TX Plano, K & H Sls. 214-423-6520
WA Redmond, The Advance Grp. 206-867-0416

ADVANTEST®

FAX: 312-634-2872

ADVANTEST AMERICA, INC., 300 Knightsbridge Parkway, Lincolnshire, IL 60069, Tel: 312-634-2552; Empl.: 163; *Sls. Mgr.:* Hiroji Agata ..... **D•1215-1217**

Instruments

Local Sales Offices & Reps

AL Huntsville, Southern Mktg. Assocs. 205-534-6020
AZ Phoenix, Advantest America, Inc. 602-840-9470
AZ Phoenix, Barnhill Associates, Inc. 602-788-9596
CA Carson, Amasco 213-516-8561
CA San Jose, Amasco 408-262-1500
CA Santa Clara, Advantest America, Inc. .. 408-970-9922
CA Santa Monica, Advantest America, Inc. 213-392-0088
CO Englewood, Barnhill Associates 303-741-3844
CT Wallingford, Pat Jenks Assocs. 203-265-9939
FL Longwood, Southern Mktg. Assocs. ... 407-682-7317
FL Orlando, Advantest America, Inc. 407-859-0722
GA 404-565-0603
GA Marietta, Southern Mktg. Assocs. 404-565-0603,
IL Elmhurst, Sector Engineering 312-530-7850
IL Lincolnshire, Advantest America, Inc. 312-634-2552
IL Park Ridge, Aegis 312-823-1587
IN Indianapolis, Sector Engineering 317-842-1120
MD Rockville, Creative Mktg. Assocs. 301-251-4100
MA Beverly, Pat Jenks Assocs. 508-921-4600
MA Marlboro, Advantest America, Inc. 508-481-1141
MI Madison Hgts., WKM Associates, Inc. 313-588-2300
MN Minneapolis, Sector Engineering 612-593-1809
NJ Fort Lee, Advantest America, Inc. 201-886-0300
NM Albuquerque, Barnhill Assocs., Inc. 505-299-7658
NY Elmsford, Metrotek Associates, Inc. 914-347-4112
NY Fayetteville, DB Associates, Inc. 315-446-0220
NC Greensboro, Southern Mktg. Assocs., Inc. 919-282-6001
OH Dayton, WKM Associates, Inc. 513-434-7500
OK Tulsa, Barnhill Associates,Inc. 918-744-6535
OR Portland, Advantest America, Inc. 503-255-8985
OR Wilsonville, SYNTEK 503-682-2750
PA Allentown, Advantest America, Inc. 215-264-7680
PA Northampton, AEGIS 215-837-8400
PA Southampton, Eastern Instrmn. of Phila. 215-355-7700
PA Stroudsburg, AEGIS 717-421-8660
TX Austin, Advantest America, Inc. 512-451-3936
TX Austin, Aegis 512-451-6188
TX Farmers Branch, Advantest America, Inc. 214-239-7834
TX Richardson, Barnhill Associates 214-231-2573
UT Salt Lake City, Barnhill Associates 801-262-3000
VT Williston, Advantest America, Inc. 802-879-8974
WA Bellevue, SYNTEK 206-462-7700
Can Mississauga, Ont., Allan Crawford Assocs., Ltd. 416-890-2010
Can N. Vancouver, B.C., Allan Crawford Assocs., Ltd. 604-988-2195
Can Ottawa, Ont., Allan Crawford Assocs., Ltd. 613-596-9300
AL Huntsville, Southern Mktg. Assoc. 205-534-6020
AZ Phoenix, Barnhill Assocs. 602-788-9596
CA Camarillo, Advantest America, Inc. 808-987-6415
CA San Jose, Amasco 408-262-1500
CA Torrance, Amasco 213-516-8561
CO Englewood, Barnhill Assocs. 303-741-3844
CT Wallingford, Pat Jenks 203-265-9939
FL Longwood, Southern Mktg.Assoc. 407-682-7317
GA Marietta, Southern Mktg. Assoc. 404-565-0603
IL Elmhurst, Sector Engrg. & Sls. 312-530-7850
IN Indianapolis, Sector Engrg. & Sls. 317-842-1120
MD Frederick, Advantest America, Inc. 301-662-1696
MD Rockville, Creative Mktg. Assoc. 301-251-4100
MA Beverly, Pat Jenks Assocs. 508-921-4600
MI Madison Heights, WKM Assocs. 313-588-2300
MN Minneapolis, Sector Engrg. & Sls. 612-593-1809
NM Albuquerque, Barnhill Assocs. 505-299-7658
NY Canastota, New York Hytek Assocs. .. 315-697-8415
NY Elmsford, Metrotek Assocs. 914-347-4112
NC Greensboro, Southern Mktg. Assoc. ... 919-854-5588
OH Dayton, WKM Assocs. 513-434-7500
OH Independence, WKM Assocs. 216-524-5930
OR Wilsonville, Syntek 503-682-2750
PA Pittsburgh, WKM Assocs. 412-892-2953
PA Southampton, Eastern Instrs. of PA ... 215-355-7700
TX Austin, Barnhill Assocs. 512-451-0217
TX Houston, Barnhill Assocs. 713-776-9825
TX Richardson, Barnhill Assocs. 214-231-2573
TX San Antonio, Barnhill Assocs. 512-694-5575
UT Orem, Barnhill Assocs. 801-262-3000
VA Sterling, Advantest America, Inc. 703-444-3372
WA Bellevue, Syntek 206-462-7700
WI Milwaukee, Sector Engrg. & Sls. 414-352-8280
Can Calgary,AL, Allan Crawford Assocs. 403-295-0822
Can Mississauga, Ont., Allan Crawford Assocs. 416-890-2010
Can N. Vancouver, B.C., Allan Crawford Assocs. 604-988-2195
Can Ottawa, Ont., Allan Crawford Assocs. 613-596-9300
Can St. Laurent, QE, Allan Crawford Assocs. 514-747-7878

ADVANTEST CORPORATION, NS Bldg. 14th,4-1,Nishi-Shinjuku 2-Chome,Shinjuku-ku, Tokyo 160, Tokyo 163, Japan, Tel: 03-342-7500, TELEX: 232-4914 ADVAN J, FAX: 03-342-7510; Empl.: 1300; *Sls. Mgr.:* Keishi Kaetsu

A E G CORPORATION, Route 22-Orr Drive, P.O. Box 3800, Somerville, NJ 08876-1269, Tel: 201-231-8300, TELEX: 833409 ..... **B•1127**

Local Sales Offices & Reps

AZ Tempe, Cantec Sls. Inc. 602-829-0191
CA El Monte, Cook Entprs. 213-686-2120
CA Livermore, United Tech. Mktg. 415-449-7644
CA San Clemente, A.T.A. Assocs. 714-498-7180
CA Santa Ana, Technlg. Solutions 714-558-9562
CA Sunnyvale, AEG Western Region 408-426-9946
CA Woodland Hills, Technlg. Solutions ... 818-704-1693
CT Farmington, Ray Perron & Co., Inc. 203-673-4825
FL Clearwater, Sigma Tech. Assocs., Inc. 813-791-0271
GA Norcross, Electramark 404-446-7915
IL Chicago, Janus Ins. 312-250-9650
IL Des Plaines, AEG Sls. Off. 312-299-8799
IL Rolling Meadows, Phase II Mktg. 312-806-1330
IL Schaumburg, AEG Cen. Region 312-303-6460
IN Ft. Wayne, M/S Sls. & Assocs., Inc. ... 219-436-3023
IA Cedar Rapids, J.P. & Assocs. 313-393-9790
MD Annapolis, Paragem, Inc. 301-269-1898
MA Needham, Ray Perron & Co., Inc. 617-449-6162
MA New Bedford, AEG Eastern Region ... 617-990-1057
MI St. Claire Shores, DEM Sls. 313-777-1750
MN Minnetonka, J.P. & Assocs., Inc. 612-935-7930
NH Dover, Ray Perron & Co., Inc. 603-742-2321
NJ Haddonfield, Sunday O'Brien 609-429-4013
NY Commack, ERA 516-543-0510
NY Long Island City, M. H. Lynn 718-352-9233
NY Syracuse, Micro-Tech Mktg. 315-458-5242
NY Syracuse, Pi Tronics Inc. 315-455-7346
NC Raleigh, Zucker Assocs., Inc. 919-782-8433
OH Cleveland, Arthur H. Baier Co. 216-461-6161
OH Columbus, Arthur H. Baier Co. 614-764-1144
OR Tigard, Elctrn. Comp. Sls. 503-245-2342
PA Camp Hill, Quick Response 717-938-9696
PA Pittsburgh, Arthur H. Baier Co. 412-367-7799
TX Garland, Pro Comp Sls. 214-276-1948
TX Hurst, Pro Comp Sls. 817-589-0336
VA Lynchburg, Paragem 804-528-0681
WA Mercer Island, Elctrn. Comp. Sls. 206-232-9301
WI Milwaukee, Janus Inc. 414-542-7575
WI Milwaukee, Phase II Mktg. 414-272-1171
Can Brampton, Ont., Cantec Reps., Inc. 416-791-5922
Can Dollard des Ormeaux, Que., Cantec Reps. 514-683-6131
Can Ottawa, Ont., Cantec Reps., Inc. 613-725-3704

Local Distributors

AZ Phoenix, Cetec/Future 602-272-7851
CA Anaheim, Pacesetter Elctrns. USA, Inc. 714-779-5855
CA Chatsworth, Cetec/Future 818-700-0914
CA Irvine, Cetec/Future 714-250-4141,818-446-5733
CA Irvine, Integrated Elctrns. 714-837-9960
CA Milpitas, Cable Conn 408-943-6655
CA Orange, Elctrn. Connexions Corp. 714-998-9241
CA Sacramento, Integrated Elctrns. 916-424-5297
CA San Diego, Cetec/Future, Inc. 619-278-5020
CA San Jose, Future Elctrns. 408-435-9100
CA San Jose, Integrated Elctrns. 408-435-1000
CA Santa Clara, Cetec/Future, Inc. 408-748-8550
CA Sunnyvale, Pacesetter Elctrns. 408-734-5470
CA Sunnyvale, SAI 408-720-0760
CO Denver, Integrated Elctrns. 303-292-6121
CO Westminster, Future Elctrns. 303-650-0123
CT Danbury, Future Elctrns. 203-743-9594
CT Wallingford, Midstoth Elctrns. 203-265-9900
FL Altemonte Springs, SAI 305-831-6201
FL Boca Raton, Plainview Elctrns. 305-997-7705
FL Clearwater, Future Elctrns. 813-578-1770
FL Ft. Lauderdale, Reptron Elctrns. 305-735-1112
FL Orlando, Future Elctrns. 305-767-8414
FL Tampa, Reptron Elctrns. 813-855-4656
GA Norcross, Future Elctrns. 404-441-7676
GA Norcross, Reptron Elctrns. 404-446-1300
IL Des Plaines, Rod Graham 312-299-8799
IL Hoffman Estates, Integrated Elctrns. .. 312-843-2040
IL Schaumberg, Future Elctrns. 312-882-1255
IL Schaumberg, Reptron Elctrns. 312-882-1700
IN Indianapolis, Mar Elctrns. 317-633-6699
IA Cedar Rapids, Dee Elctrns. 319-365-7551
MD Columbia, Future Elctrns. 301-995-1222
MD Columbia, Gen. Radio Supply Co. 301-995-6744
MA Westboro, Future Elctrns. 617-366-2400
MA Wilmington, SAI 617-657-5700
MI Livonia, Reptron Elctrns. 313-525-2700
MN Minnetonka, Reptron Elctrns. 612-938-0000
NJ Camden, General Radio 609-964-8560
NJ Cherry Hill, Exact Inc. 609-429-6586
NJ Mount Laurel, Future Elctrns. 609-778-7600
NJ Newark, Samar Corp. 201-344-4453
NJ West Berlin, Gen. Components Inc. 609-768-6767
NM Albuquerque, Elctrn. Dvcs., Inc. 505-884-2950
NY Liverpool, Future Elctrns. 315-451-2371
NY Melville, SAI 516-293-2710
NY Rochester, Future Elctrns. 716-272-1120
OH Worthington, Reptro Elctrns. 614-436-6675
OR Beaverton, Future Elctrns. 503-645-9454
OR Beaverton, Integrated Elctrns. 503-641-1690
TX Ft. Worth, Swieco, Inc. 817-335-6521
TX San Antonio, Sherman Elctrns. 512-224-1004
UT N. Salt Lake City, Integrated Elctrns. .. 801-298-1869
UT Salt Lake City, Future Elctrns. 801-972-8489
VT Rutland, SAI 802-775-7126
WA Bellevue, Future Elctrns. 206-881-8199
WA Bellevue, Integrated Elctrns. 206-455-2727
Can Calgary, Alb., Future Elctrns. 403-235-5325
Can Downsview, Ont., Future Elctrns. 416-638-4771
Can Edmonton, Alb., Future Elctrns. 403-438-2858
Can Ottawa, Ont., Future Elctrns. 613-820-8313
Can Pointe Claire, Que., Future Elctrns., Inc. 514-694-7710
Can Vancouver, B.C., Future Elctrns. 604-294-1166

TELEFUNKEN electronic
Creative Technologies

FAX: 201-231-8353

A E G CORPORATION, Telefunken Semiconductors Div., 3140 Route 22, Somerville, NJ 08876-1269, Tel: 201-231-8300; *Sls. Mgr.:* John Szafranski ..... **B•1127**

Local Sales Offices & Reps

AL Huntsville, Elctrn. Mktg. Assocs. 205-536-3044
AZ Tempe, Cantec Sls., Inc. 602-345-1276
CA Campbell, Kottmeier Assocs., Inc. 408-371-8700
CA Fallbrook, Gary Chilcote Assocs. 619-728-7678
CA Santa Ana, Technlg. Solutions 714-558-9562
CA Woodland Hills, Technlg. Solutions ... 818-704-1693
CO Broomfield, Western Region Mktg. 303-469-8808
CT Bethel, Ray Perron Co., Inc. 203-798-0261
CT Farmington, Ray Perron Co., Inc. 203-673-4825
FL Tampa, Laramar, Inc. 813-963-3910
GA Atlanta, Elctrn. Mktg. Assocs. 404-448-1215
IL Rolling Meadows, Phase II Mktg. 312-806-1330
IN Ft. Wayne, M/S Sls. & Assocs. 219-436-3023
IN Greenwood, M/S Sls. & Assocs. 317-881-0110
MD Annapolis, Parogem, Inc. 301-269-1898
MA Needham, Ray Perron Co., Inc. 617-449-6162
MI Grand Rapids, DEM Sls., Inc. 616-344-4024
MI St. Clair Shores, DEM Sls., Inc. 313-777-1750
MN Minnetonka, J.P. & Assocs., Inc. 612-935-7930
NH Merrimack, Ray Perron Co., Inc. 603-424-4423
NY Commack, ERA 516-543-0510
NY Kingston, Micro-Tech Mktg., Inc. 914-338-7588

NY N. Syracuse, Micro-Tech Mktg., Inc. ... 315-458-5242
NY Rochester, Micro-Tech Mktg., Inc. 716-328-1420
NC Raleigh, Zucker Assocs. 919-782-8433
OR Tigard, Elctrn. Comp. Sls. 503-245-2342
PA Drexel Hill, DNE Sls. 215-789-6822
TX Hurst, Procomp Sls. 817-589-0336
TX Richardson, Procomp Sls. 214-669-1500
VA Lynchburg, Parogem, Inc. 804-528-0681
WA Mercer Island, Elctrn. Comp. Sls. 206-232-9301
Can Brampton, Ont., Cantec Reps. 416-791-5922
Can Ottawa, Ont., Cantec Reps. 613-725-3704
Can Quebec, Cantec Reps. 514-683-6131

Local Distributors

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CT Midstate Elctrns. 203-265-9900
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IN Mar Elctrns. 317-633-6699
IA Dee Elctrns. 319-365-7551
NJ Gen. Comps., Inc. 609-768-6767
NJ GRS Elctrns. 609-964-8560
NY SAI 516-293-2710
Can Quebec, Future Elctrns. 514-694-7710

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AEL, INC, See American Electronic Labs

AEMC CORPORATION, 99 Chauncy Street, Boston, MA 02111, Tel: 617-451-0227, 800-343-1391, TELEX: 95-1073, FAX: 617-423-2952; *Sls. Mgr.:* George Wood

AEROCOM, 3090 S.W. 37th Ave., Miami, FL 33133, Tel: 305-448-6503, TELEX: 6812020, FAX: 305-448-6916; FSC No.: 81535; Empl.: 55; *Sls. Mgr.:* Thomas A. Coleman

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AEROFLEX LABORATORIES INC., ARX, Inc., 35 South Service Road, Plainview, NY 11803, Tel: 516-694-6700, TWX: 510-224-6417; FSC No.: 88379; Empl.: 490 ..... **A•1737; B•1224-1227**

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AZ Mesa, Sonoran Western Inds., Inc. 602-820-9986
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CA Orange, Qualitech Assocs. 714-639-9820
CA Palos Verdes, W.J. Miller Co. 213-375-3001
CA Palos Verdes's Peninsula, W. J. Miller Co. 213-375-3001
CA Santa Clara, Computer Modules, Inc. 408-496-1881
CA Sunnyvale, Qualitech Assocs. 408-732-4800
CO Littleton, Computer General 303-972-0752
CO Parker, Parker Webster Co. 303-841-4888
CT Hartford, C.S.I. Interconnect Prods. 203-644-8637
CT Hartford, C.S.I. Interconnect Prods. 203-873-1425
CT S. Windsor, C.S.I. Interconnect Prods. 203-644-1276
CT So. Windsor, C.S.I. Interconnect Prods. 203-644-8637
CT Southbury, Dynamic Technlgs. 203-262-6220
FL Clearwater, Brennan Assocs., Inc. 813-446-5006
FL Lake Buena Vista, Brennan Assocs. .. 813-988-0561
FL Orlando, Brennan Assocs., Inc. 305-239-4399
FL Palm Bay, Star Tec Data Sys., Inc. 305-727-2247
GA Atlanta, Magaro & Assocs. 404-451-8862
IL Northfield, Feller Assocs., Inc. 312-446-8065
IA Cedar Rapids, Field Sls. Off. 319-364-0566
KS Wichita, Avionic Eng'r. Sls. Co. 316-264-6201
KS Wichita, Avionic Engrg. Sls. Co. 316-264-6201
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MA Newberry Port, C.S.I. Interconnect Prods. 617-465-6276
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MA Westborough, Technical Applications Assocs., Inc. 508-366-9781
MN Edina, Micro Resources Corp. 612-830-1454
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NJ Montvale, Henley Chemical Co. 201-307-0422
NY Albertson, DOL Engrg. 516-747-3944
NY Albertson, DOL Engrg., Inc. 516-747-3944
NY Cazenovia, DOL Engrg. 315-655-8602
NY Cazenovia, DOL Engrg. 315-334-0722
NY Hicksville, C.S.I. Interconnect Prods. 516-334-0722
NY Port Washington, Daner Hayes 516-767-9169
NY Youngstown, DOL Engrg. 716-754-7051
OH Novelty, Feller Assocs., Inc. 216-338-3774
OH Novelty, Field Sls. Off. 216-338-3774
OH Solon, J.R. Thornberry Co. 216-248-4995
OK Tulsa, Milko Mktg. 918-582-9411
PA Horsham, Nexus Technlg. Sls., Inc. 215-675-9600
TX Austin, Milko Mktg. 214-453-3023
TX Dallas, Tesco, Inc. 214-553-1200
TX Houston, Milko Mktg. 713-723-5003
TX Richardson, Milko Mktg. 214-783-2785
TX Richardson, Milko Mktg. 214-783-2716
VA Front Royal, Eltron Sls. Ltd. 703-635-7201
WA Mercer Island, Eagle Entprs., Inc. 206-232-7401
WA Mercer Island, Electronic Comp. Sls., Inc. 206-232-9301
EXP NJ/Montvale, Henley Elctrns. 201-307-0422
Can Laval, Que., Elcom GMBH, Inc. 514-668-3361
Can Nepean, Ont., Multilek, Inc. 613-226-2365

AEROSPACE OPTICS, INC., 3201 Sandy La., Fort Worth, TX 76112, Tel: 817-451-1141, TELEX: 75-8461; Empl.: 83; *Sls. Mgr.:* Ben L. Fryrear

AEROTECH, INC., 101 Zeta Dr., Pittsburgh, PA 15238, Tel: 412-963-7470, TWX: 710-795-3125, FAX: 412-963-7459; Empl.: 156; *Sls. Mgr.:* F. Armstrong; *Dist. Mgr.:* K. Ross

AEROTRONIC, General Signal, Riverside Dr., Contoocook, NH 03229, Tel: 603-746-4631, TWX: 710-366-1684, FAX: 603-746-4679; FSC No.: 67272; Empl.: 100

AEROVOX INC., 740 Belleville Ave., New Bedford, MA 02745, Tel: 617-994-9661, TWX: 710-344-6985, FAX: 617-994-9635; FSC No.: 4K459; Empl.: 800; *Sls. Mgr.:* Jack Chmura; *Dist. Mgr.:* Bob Ritchie

AERTECH INDS., See TRW Microwave

AES CORP., 285 Newbury St., Peabody, MA 01960, Tel: 508-535-7310, TELEX: 387852 AES CORP INTL, FAX: 508-535-7313; Empl.: 25; *Sls. Mgr.:* Philip G. Huntley

AETNA ENGINEERING, P.O. Box 7749, Van Nuys, CA 91409-7749, Tel: 818-341-9409; Empl.: 6; *Sls. Mgr.:* T. W. Collins

AFI/DATATROL, See Datatrol, Div. of Data Card Corp.

AIL, DIV. CUTLER-HAMMER, See Eaton Corp. AIL Div.

AIL SYSTEMS, INC., Eaton Corp., Commack Rd., Deer Park, NY 11729, Tel: 516-595-3094, TWX: 510-227-6073; FSC No.: 00752; Empl.: 4600; *Sls. Mgr.:* J.B. Migliaccio

AILTEC DIV. CUTLER-HAMMER, See Eaton Corp., Elctrn. Instrmn. Div.

AIMSCO INC., Cheler Corp., 4024 22nd Ave. W., Seattle, WA 98199-0056, Tel: 206-284-5563, 800-426-0244, TWX: 910-444-1333, FAX: 206-285-4327; Empl.: 30; *Sls. Mgr.:* C. Ernst; *Dist. Mgr.:* Carl Teichman

AIPHONE, 1700 130th Ave. NE, Bellevue, WA 98005, Tel: 206-455-0510, FAX: 206-455-0071; Empl.: 44; *Sls. Mgr.:* Jim Morrison

AirBorn

FAX: 214-931-9305

AIRBORN, INC., 4321 AirBorn Dr., Addison, TX 75001-0519, Tel: 214-931-3200, TELEX: 79-4200, TWX: 910-860-5230; FSC No.: 10400;Multiple; Empl.: 548; *Sls. Mgr.:* T. V. Lee, Sls. Mgr.; *Dist. Mgr.:* Jerry Jameson ..... **C•1132-1143**

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AL Huntsville, South Design & Mktg. 205-880-3623
AZ Tempe, Piper Sls. Co. 602-949-0048
CA Downey, Buffa Co., Inc. 213-923-4618
CA Sunnyvale, Marquez & White 408-746-0800
FL Ft. Lauderdale, Southland Comps. 305-491-6110
IL Des Plaines, ESCO Assoc. 312-298-5310
IA Cedar Rapids, Dytronix 319-377-8275
KS Wichita, Dytronix 316-838-0884
MD Hunt Valley, Eagle Sls. Corp. 301-666-3930
MN St Paul, Johnson Co. 612-641-1878
MO Bridgeton, Dytronics, Inc. 314-291-4777
KS Leawood, Dytronix 913-339-6333
NH Nashua, Solla - Tronics 603-882-7146
NY Glen Cove, Dynorep 516-676-1598
NM Albuquerque, Piper Sls. Co. 505-883-9090
NY Penfield, Upstate Comps. 716-381-6070
NC Raleigh, GWC 919-790-7879
OH Dayton, Electro-Com 513-299-0864
TX Austin, Pro-Mark 214-644-0467
TX Richardson, Pro-Mark 214-644-0467
WA Seattle, Eltech Inc. 206-643-4330
Can Mississauga, Ont., Source Elctrns. Ltd. 416-676-0830
Can Ottawa, Ont., Source Elctrns. Ltd. 613-737-7580

Local Distributors

TX Addison, AirBorn Distribution Service 214-931-3200
TX Dallas, Accutronic Prods. 214-484-4923
TX Dallas, Hallmark Elctrns. 214-553-4300

Distributor

AIR ELECTRO INC., 7700 Gloria Ave., Van Nuys, CA 91406, Tel: 213-873-6400, 818-988-4400, TELEX: 66-2459, TWX: 910-495-1794, FAX: 818-988-4746 ..... **C•1310**

AIR/FLEX INDS. INC., 2422 Merced Ave., S. El Monte, CA 91733, Tel: 818-579-7060, FAX: 1-818-579-7063; FSC No.: 22782; *Sls. Mgr.:* Karl Thorp

Airflyte ELECTRONICS CO.

FAX: 201-436-6024

AIRFLYTE ELCTRNS. CO., 56 New Hook Rd., P. O. Box 231, Bayonne, NJ 07002, Tel: 201-436-2230; Empl.: 85; *Sls. Mgr.:* John Piret ..... **B•1228-1233**

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CA Los Altos, Poltronics 415-941-3020
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IL Park Ridge, Probe Elctrns. 312-698-2044
MA Lexington, Kitchen & Kutchin 617-862-8230
NJ Kinnelon, Avionics Equip. 201-838-8105
NY Rochester, Milton C. Matthews Co. 716-271-1910
PA Downingtown, Budd Elctrns. Corp. 215-458-8258
TX Austin, Electra Reps., Inc. 512-339-1163
TX Dallas, Electra Reps., Inc. 214-248-3852

AIR LAND SYSTEMS CORPORATION, 2710 Prosperity Ave., Fairfax, VA 22031, Tel: 703-573-1100, TELEX: 710-833-1174, TWX: Airland Frax; Empl.: 50

AIR MAZE CORP., 25000 Miles Rd., Cleveland, OH 44128, Tel: 216-292-6800, TELEX: 98-5413; Empl.: 300; *Sls. Mgr.:* G. E. Yoho

AIR-O-TRONICS, Trush Group, Route 20 E., Cazenovia, NY 13035, Tel: 315-655-2387, TWX: 710-541-1530, FAX: 315-655-3862; FSC No.: 16663; Empl.: 15

AIRPAX CO., CAMBRIDGE DIVISION, Woods Rd., Cambridge, MD 21613, Tel: 301-228-4600, TELEX: 6849138, TWX: 710-865-9655, FAX: 301-228-8910; FSC No.: 81541; Empl.: 1100; *Sls. Mgr.:* Bob Phillips ..... **B•1352**

Local Sales Offices & Reps

AL Huntsville, BCI 205-539-4411
AZ Tempe, Westrep 602-820-9932
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CA San Diego, Westrep 619-566-6580
CA Santa Ana, Airpax Co. 408-980-0410
CO Littleton, Lange Sls. 303-795-3600
CT Clinton, Selmark Assocs. 203-573-9088
FL Pompano Bch., Airpax Co. 305-978-9019
GA Chamblee, BCI 404-455-0405
IL Palatine, Somers-Stanton, Inc. 312-991-1108
IN Indianapolis, Airpax Co. 317-573-9911
IA Marion, Rep Assocs. 319-373-0152
MD Frederick, Airpax Co. 301-243-3133
MA Millis, Selmark 508-376-2914
MI Farmington Hills, Airpax Co. 313-553-6030
MN Minnetonka, Airpax Co. 612-933-0170
MO Florissant, Delltron 314-839-0033
MO Kansas City, Delltron 816-436-6445
NH Hopkinton, Selmark Assocs. 603-746-3299
NY Fishkill, Airpax Co. 914-897-3170
NY Jericho, Airpax Co. 516-822-2410
NY Rochester, Airpax Co. 716-654-7470
NC Winston-Salem, L.G. White 919-725-3612

OH Dayton, Baehr, Greenleaf 513-439-0724
OH Westlake, Baehr, Greenleaf 216-892-1770
OH Worthington, Baehr, Greenleaf 614-847-0220
OR Beaverton, Airpax Co. 503-641-6130
PA Harleysville, T. Jackson 215-256-8877
PA Pittsburgh, Russell F. Clark 412-242-9500
SC Greenville, L.G. White 803-271-0630
TX Dallas, Airpax Co. 214-851-7433
UT Salt Lake City, Lange Sls. 801-487-0843
WI Wauwatosa, Larson Assocs. 414-258-0529

AIRPAX CO., Cheshire Div., Cheshire Indl. Pk, Box E, Cheshire, CT 06410, Tel: 203-271-6000, TWX: 710-455-4048, FAX: 203-271-6100; Empl.: 800; *Sls. Mgr.:* John Ricardi ..... **B•1931; D•1137**

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CO Littleton, Lange Sls. 303-795-3600
CT Clinton, Selmark Assocs. 203-573-9088
FL Pompano Bch., Airpax Co. 305-978-9019
GA Chamblee, B.C.I. 404-455-0405
IL Palatine, Somers-Stanton, Inc. 312-991-1108
IN Indianapolis, Airpax Co. 317-573-9911
IA Marion, Rep Assocs. 319-373-0152
MD Frederick, Airpax Co. 301-243-3133
MA Millis, Selmark Assocs. 508-376-2914
MI Farmington Hills, Airpax Co. 313-553-6030
MN Minnetonka, Airpax Co. 612-933-0170
MO Florissant, Delltron 314-839-0033
MO Kansas City, Delltron Co., Inc. 816-436-6445
NH Hopkinton, Selmark Assocs. 603-746-3299
NY Fishkill, Airpax Co. 914-897-3170
NY Jericho, Airpax Co. 516-822-2410
NY Rochester, Airpax Co. 716-654-7470
NC Winston-Salem, L. G. White 919-725-3612
OH Dayton, Baehr, Greenleaf & Assocs. .. 513-439-0724
OH Westlake, Baehr, Greenleaf & Assocs. 216-892-1770
OH Worthington, Baehr, Greenleaf & Assocs. 614-847-0220
OR Beaverton, Airpax Co. 503-641-6130
PA Harleysville, Thomas Jackson Assocs. 215-256-8877
PA Pittsburgh, Russell F. Clark Co. 412-242-9500
SC Greenville, L.G. White Southern, Inc. .. 803-271-0630
TX Dallas, Airpax Co. 214-851-7433
UT Salt Lake City, Lange Sls. 801-487-0843
WI Wauwatosa, Larson Assocs. 414-258-0529

AIRPAX CO., Frederick Div., Husky Park P.O. Box 500, Frederick, MD 21701, Tel: 301-663-5141, TWX: 710-862-0901, FAX: 301-698-0624; Empl.: 600; *Sls. Mgr.:* Joe Ruth, Mktg. Mgr.; *Dist. Mgr.:* B. L. Reeder ..... **B•1413, 1887**

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OR Beaverton, Airpax Co. 503-641-6130
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PA Pittsburgh, Russell F. Clark Co. 412-242-9500
SC Greenville, L. G. White Southern, Inc. .. 803-271-0630
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UT Salt Lake City, Lange Sls. 801-487-0843
WI Wauwatosa, Larson Assocs. 414-258-0529

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OK Tulsa, Altair 918-665-0524
TX Houston, Altair 713-462-3029
TX Richardson, Altair 214-231-5166

AIRPAX CO., International Div., West Johnson Ave., Cheshire, CT 06410, Tel: 203-272-0301, TELEX: 643967; Empl.: 350; *Sls. Mgr.:* Walter Kalwara

AIRPAX CO., SENSOR DIV., A Division of North American Philips Corp., Cheshire Industrial Park, Cheshire, CT 06410, Tel: 203-272-0301, TELEX: 962421, TWX: 710-455-4048, FAX: 203-271-1395; Empl.: 200; *Sls. Mgr.:* Jim Rochford

AIRTRON, Litton Industries, Inc., 200 E. Hanover Ave., Morris Plains, NJ 07950, Tel: 201-539-5500, TWX: 710-986-7473, FAX: 201-539-0357; FSC No.: 80006; Empl.: 500; *Sls. Mgr.:* M. R. Grosso, Natl. Sls. Mgr.

AIR-VAC ENGRG., 100 Gulf St., Milford, CT 06460, Tel: 203-874-2541, FAX: 203-783-1383; Empl.: 40

AJAX MAGNETHERMIC CORP., 1745 Overland Ave., N.E., Warren, OH 44482, Tel: 216-372-8511, TELEX: 098-2482, FAX: 216-372-8644; Empl.: 500

AKG ACOUSTICS, INC., 77 Selleck St., Stamford, CT 06902, Tel: 203-348-2121, TELEX: 285481, FAX: 203-324-1942; Empl.: 25; *Sls. Mgr.:* Rowland Powers

AKRO-MILS, 1293 S. Main St., Akron, OH 44301, Tel: 216-253-5593, TELEX: 98-6321, FAX: 216-253-9801; Empl.: 200; *Sls. Mgr.:* W. J. Tonachio; *Dist. Mgr.:* D. Martin

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ALAN GORDON ENTPRS., INC., P.O. Box 3914, 5362 Cahuenga Blvd., N. Hollywood, CA 91601, Tel: 818-985-5500, TELEX: AGE-FOTO LSA 662532, TWX: 910-321-4526 GO, FAX: 213-871-2193; FSC No.: 94972; Empl.: 81; *Sls. Mgr.:* D. Sahlein

ALAN INDUSTRIES INC., P.O. Box 1203, Columbus, IN 47201, Tel: 812-372-8869, FAX: 812-372-5909; FSC No.: 52750; Empl.: 36; *Sls. Mgr.:* Blayde A. Kennedy

ALARM CONTROLS CORPORATION, P.O. Box 280, Deer Park, NY 11729, Tel: 516-586-4220, FAX: 516-586-6500; FSC No.: 55042; Empl.: 50; *Sls. Mgr.:* John Benedetto

ALASCO RUBBER & PLASTICS CORP., 617 Mountain View Ave.67, Belmont, CA 94002, Tel: 415-595-4100, FAX: 415-595-0298; FSC No.: 13862; Empl.: 25; *Sls. Mgr.:* Philip K. Nordberg

ALBAR, INC., 19013 36th Ave. W., Lynnwood, WA 98036, Tel: 206-771-4006, 800-822-5227, FAX: 206-771-2163; Empl.: 50; *Sls. Mgr.:* Mark Molina

ALBEROX CORPORATION, New Bedford Ind'l. Pk., New Bedford, MA 02745, Tel: 508-995-1725, FAX: 508-995-6954; Empl.: 180

ALBION INDUSTRIES, 800 N. Clark St., Albion, MI 49224, Tel: 517-629-9441

ALDEN COMPUTER SYSTEMS, One Salem Green, Ste. 420, Salem, MA 01970, Tel: 508-744-1314; *Sls. Mgr.:* Donald O'Brien

ALDEN ELECTRONICS, INC., 40 Washington Street, Westboro, MA 01581, Tel: 508-366-8851, TELEX: 94-8404, FAX: 617-898-2427; Empl.: 145; *Sls. Mgr.:* L. A. Farrington

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FAX: 508-583-0164

ALDEN PRODUCTS CO., P.O. Box 860, 117 N. Main St., Brockton, MA 02403, Tel: 508-583-0160, TELEX: 28-7793 ALDN UR; FSC No.: 01009; Empl.: 150; *Sls. Mgr.:* Donald J. Paul ..... **C•1144-1146**

ALDEN SYSTEMS, Alden Products Co., 262 N. Main St., P.O. Box 860, Brockton, MA 02403-0860, Tel: 508-583-0160, TELEX: 287 793 ALDN UR, FAX: 508-583-0164; Empl.: 150; *Sls. Mgr.:* D. Paul

A. L. DESIGN, INC., 4232 Ridge Lea Rd., Amherst, NY 14226, Tel: 716-833-6272, FAX: 716-833-8856; Empl.: 20

ALEPH INTERNATIONAL, 1026 Griswold, San Fernando, CA 91340, Tel: 818-365-9856

A.L.E. SYS., INC., 150 Homer Ave., Ashland, MA 01721, Tel: 508-881-5252, TELEX: 928-209, FAX: 617-235-6588; Empl.: 65; *Sls. Mgr.:* Barry Essig

ALEXANDER BATTERIES, New Product/OEM Divison, P.O. Box 28880, San Diego, CA 92128, Tel: 619-480-4445, TELEX: 371-9855, FAX: 619-480-1351; Empl.: 175; *Sls. Mgr.:* Dave Zeman ..... **D•1451**

Local Sales Offices & Reps

CO Denver, Aurora Mktg. 303-758-3051
GA Atlanta, Alexander Battery S.E. 404-968-4087
IL McHenry, Alexander Battery Co. 815-344-0666
IA Mason City, Jon Alexandres 515-423-8955
MN Minneapolis, Paul Ohlin 612-941-7697
NJ Middlesex, Jim Sapp 201-271-5880
OH Dublin, Alexander Battery, Mideast 614-764-8771
TX Arlington, Alexander Battery South 800-323-3813

ALEXANDER MANUFACTURING COMPANY, P.O. Box 1508, Mason City, IA 50401, Tel: 800-247-1821, 515-423-8955, TELEX: 3719855, FAX: 515-423-1644; Empl.: 250

ALFORD MANUFACTURING CO., P.O. Box 2116, 32 Sixth Rd., Woburn, MA 01801, Tel: 617-935-8610, FAX: 617-933-4512; FSC No.: 07177; Empl.: 20; *Sls. Mgr.:* Fred Abel

ALGO, INC., 9198-C Red Branch Rd., Columbia, MD 21045, Tel: 301-730-7442, TELEX: 333405; Empl.: 12; *Sls. Mgr.:* G. J. O'Mara

ALINABAL, 28 Woodmont Rd., Milford, CT 06460, Tel: 203-877-3241, TWX: 710-462-1178, FAX: 203-877-3241 (ext. 360); Empl.: 255

ALLEN AVIONICS, INC., 224 E. 2nd St., Mineola, NY 11501, Tel: 516-248-8080, FAX: 516-747-5481; Empl.: 300; *Sls. Mgr.:* Richard Mintz ..... **A•1504, 1684**

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AZ Phoenix, J. F. Hurlbut Co. 602-952-2079
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CA Palo Alto, Adtek Assocs. 415-323-5414
CA San Diego, Van Gott & Assocs. 619-308-0667
CO Golden, J. F. Hurlbut Co. 303-279-7796
NY Plainview, Eastern Metro Assocs. 516-931-1414
OR Beaverton, Evergreen Mktg. Grp. 503-643-8020
PA Huntingdon Valley, Rabal Assocs. 215-947-4825
TX Dallas, Bradenco Corp. 214-352-3554
VA Alexandria, Vanguard Engrg. Sls. 703-768-1660
WA Seattle, Evergreen Mktg. Grp. 206-633-3160

ALLEN BRADLEY CO., ELECTRONIC COMPONENTS DIV., A Rockwell International Co., 1414 Allen-Bradley Dr., El Paso, TX 79936, Tel: 915-592-4888, 800-592-4888, TELEX: 749-400, FAX: 915-594-8922; Empl.: 6500; *Sls. Mgr.:* Hugh Tyler; *Dist. Mgr.:* Chestley Grimsley ..... **A•2080-2081**

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CA Calabasas, Wyle Laboratories 818-880-9000
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CA Chatsworth, TTI, Inc. 818-709-1010
CA El Monte, Marshall Inds. Elctrns. Grp. 818-459-5500

CA El Segundo, Wyle Labs. 213-322-8100
CA Irvine, Marshall Inds. Elctrns. Grp. 714-859-5050
CA Irvine, Wyle Labs. 714-863-9953
CA Milpitas, Marshall Elctrns. Grp. 408-943-4600
CA Milpitas, TTI, Inc. 408-946-5577,
CA Rancho Cordova, Wyle Labs. 916-638-5282
CA San Diego, Wyle Labs. 619-565-9171
CA Santa Clara, Wyle Labs. 408-727-2500
CO Thornton, Wyle Distbn. Grp. 303-457-9953
CT Stratford, TTI, Inc. 203-375-1400
CT Wallingford, Marshall Elctrns. Grp. 203-265-3822
FL Orlando, Hammond Elctrns., Inc. 305-849-6060
FL Orlando, TTI, Inc. 305-859-1000
GA Atlanta, Marshall Elctrns. Grp. 404-923-5750
GA Atlanta, TTI, Inc. 404-662-0911
IL Chicago, Newark Elctrns. 312-784-5100
IL Palatine, Ohm Elctrns., Inc. 312-359-5500
IN Ft. Wayne, Graham Elctrns. Supp., Inc. 219-423-3422
IN Indianapolis, Graham Elctrns. Div. 317-875-8200,
MD Gaithersburg, Almo Elctrns. Inc. 301-670-0090
MD Gaithersburg, Marshall Elctrns. Inc. 301-840-9450
MA Canton, Almo Elctrns. 617-821-1450
MA Wilmington, Marshall Elctrns. Grp. 617-658-0810
MA Wilmington, TTI, Inc. 617-658-4700,
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NY Hauppauge, Marshall Elctrns. Grp. 516-273-2424
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NY Rochester, Marshall Elctrns. Grp. 716-235-7620
NY Ronkonkoma, TTI, Inc. 516-737-2000
NC Greensboro, Hammond Elctrns., Inc. 919-275-6391
OH Columbus, Electronics Mktg. Corp. 614-229-4161
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OH Solon, Marshall Elctrns. Grp. 216-248-1788
OR Hillsboro, Wyle Labs. 503-640-6000
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TX Fort Worth, TTI, Inc. 817-831-0441
TX Houston, Harrison Equip. Co., Inc. 713-879-2600
TX Richardson, Wyle Labs. 214-235-9953
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Can Nepean, Arrow Elctrns. Canada Ltd. 613-226-6903
Can Quebec, Arrow Elctrns. Canada Ltd. 418-687-4231
Can Toronto, Ont., Arrow Elctrns. Canada Ltd. 416-672-7769,

ALLEN-BRADLEY CO., Industrial Control Div., 1201 S. Second St., Milwaukee, WI 53201, Tel: 414-382-2000, TELEX: 26699, TWX: 4311016; Empl.: 1600; *Dist. Mgr.:* Bob Anderson

ALLEN-BRADLEY CO., MAGNETICS DIVISION, Div. of Rockwell Corp., 5900 N. Harrison St., Shawnee, OK 74801, Tel: 405-275-2100, TELEX: 4311016; *Sls. Mgr.:* Carl Tufts, Dir. Mktg./Sls.; *Dist. Mgr.:* Jerry White, Natl. Sls. Mgr.

FAX: 818-765-2387

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IL Chicago, Rendell Sls. 312-967-1513
KS Leawood, James W. Dixon Co. Inc. 913-649-0805
KS Mission, Mertens Assoc. Inc. 913-432-9323
MA Burlington, Omni Rep 401-333-2353
NJ Palisades Park, Janco Technlg. Inc. 201-941-4008
NM Albuquerque, Nelco Elctrns. 503-293-1399
NY Rochester, Micro Tech Mktg., Inc. 716-328-3000
OR Portland, SPS Elctrns. 503-297-6919
PA Frazer, Industrial Comps. Inc. 215-889-0650
TX Irving, Kite Elctrns. 214-986-0321
WA Redmond, Interstate Elctrns. 206-323-4140
EXP Dublin, Ireland, Standard Comps. Ltd. 375-25025
Can Ontario, Intrade Canada, Inc. 613-727-1272

ALLEN DATAGRAPH, INC., 2 Industrial Way, Salem, NH 03079, Tel: 603-893-1983, TWX: 710-366-0504, FAX: 603-893-9042; *Sls. Mgr.:* Tom Allen

ALLIED CONTROL, 100 Relay Rd., Plantsville, CT 06479, Tel: 203-621-6771, TWX: 710-473-0079 ALLIED CONTROL, FAX: 203-621-4932; FSC No.: 5945; *Sls. Mgr.:* Mark Freyermuth ..... **B•1415-1419, 1832-1833**

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CA Irvine, Component Mktg. Assocs., Inc. 714-951-5950
CA Tarzana, Component Mktg. Assocs., Inc. 818-708-8058
CO Denver, Elctrn. Sls., Inc. 303-771-6300
CT Clinton, Selmark Assocs., Inc. 203-573-9088
GA Lawrenceville, Electro-Rep Assocs. 404-564-1863
IL Skokie, Industrial Reps., Inc. 312-967-8430
IN Indianapolis, M & L Elctrn. Sls. 317-359-4742
MD Columbia, Delta III Assocs., Inc. 301-730-4700
MA Millis, Selmark Assocs., Inc. 508-376-2914
MN Wayzata, Cardinal Sls. Co. 612-475-0042
NH Hopkinton, Selmark Assocs., Inc. 603-746-3299
NJ Medford, Component Consultants 609-654-5300
NY Clark Mills, KLM-Garner 315-853-6126
NY Franklin Square, Cooper-Simon & Co., Inc. 516-489-0404
NC Charlotte, Electro-Rep Assocs. 704-527-2530
OH Beachwood, Elctrn. Salesmasters, Inc. 216-831-9555
OK Tulsa, Component Technlg. 918-749-2107
PA Pittsburgh, Process Engrg. Co. 412-561-5050
TX Austin, Comp. Technlg. 512-250-2450
TX Dallas, Comp. Technlg. 214-783-8831
TX El Paso, Alexander Entprs. 915-591-3142
TX Houston, Component Technlg. 713-961-1262
VA Midlothian, Delta III Assocs., Inc. 804-379-1816
WA Everett, Huntley Assocs. 206-337-5594
WI Milwaukee, Industrial Reps., Inc. 414-259-0965
Can North York, R. D. Assocs. 416-444-0959

Local Distributors

CA Hayward, KEA Elctrns. 415-887-2900
CA Los Angeles, Master Distrs. 213-452-1229
CA Monrovia, Erik-A Elctrns. 818-574-1020
CA Santa Ana, El-Com, Inc. 714-432-6633
CA Santa Ana, Norstan Elctrns. Inc. 213-924-7651
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FL Orlando, T & T Prods. 407-857-2282
IL Chicago, Newark Elctrns. 312-784-5100
IN Indianapolis, Bell Inds. 317-875-8200
MA Newton, Greene-Shaw 617-969-8900
MN Minneapolis, Control Design 612-721-1628
MN Minneapolis, Sterling Elctrns. 612-831-2666
NJ Oakland, Relay Specialties 201-337-1000
NY Buffalo, Summit Distrbg. 716-887-2800
NY Farmingdale, Pride Elctrns. 516-293-4020
NY Hauppauge, Jaco Elctrns. 516-273-5500
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OK Oklahoma City, Electro Entprs. 405-427-6591
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PA Philadelphia, Shap Elctrns. 215-969-3300
VA Roanoke, Control Dists. 703-989-7925
Can Pointe Claire, Que., Future Elctrns. 514-694-7710

ALLIED CORPORATION, Bendix Electric Power, 118 Hwy. 35, Eatontown, NJ 07724, Tel: 201-542-2000, TELEX: 132-444 , TWX: 710-722-6686; FSC No.: 83298;Multiple; Empl.: 950; *Sls. Mgr.:* R. Freeman; *Dist. Mgr.:* Cal Schrum

ALLIED ELECTRONICS, INC, Hall-mark, 401 E. 8th St., Fort Worth, TX 76104, Tel: 800-433-5700, FAX: 817-336-9168

ALLIED-SIGNAL AEROSPACE CO., Communications Div., 1300 E. Joppa Rd., Towson, MD 21204, Tel: 301-583-4000, TWX: 710-232-1823, FAX: 201-337-7485; Empl.: 1500; *Sls. Mgr.:* Jack L. Shagena

ALLIED SYSTEMS CORP., Box 18077, Greensboro, NC 27419, Tel: 919-299-2294; Empl.: 25; *Sls. Mgr.:* Nan B. Kollar

ALLIGATOR TECHNOLOGIES, P.O. Box 9706, Fountain Valley, CA 92708, Tel: 714-850-9984, FAX: 714-850-9987; Empl.: 5; *Sls. Mgr.:* Ela Tsaug; *Dist. Mgr.:* Robert Galter

FAX: 312-728-6410

ALL-STATES, INC., 1801 W. Foster Ave., Chicago, IL 60640, Tel: 312-728-0525, TELEX: 317027; FSC No.: 26863 ..... **C•1148-1150**

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AL Huntsville, Cartwright & Bean, Inc. of Ga. 205-830-1540
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CA Mtn. View, Westech Sls. 415-961-1422
CA Norwalk, Agents West Inc. 213-921-0730
CO Denver, Agency Sls. 303-455-7342
CT Glastonbury, Barton Assocs. 203-633-9417
FL Deerfield Bch., Cartwright & Bean, Inc. of FL. 305-429-3400
FL Orlando, Cartwright & Bean, Inc. of FL. 407-422-4531
GA Norcross, Cartwright & Bean, Inc. of GA. 404-368-0160
IL Wheaton, Chadra-Schilke & Assocs., Inc. 312-653-8126
IN Indianapolis, Hoster & Sieloff Assocs., Inc. 317-842-3700
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NJ Clifton, Thea & Schoen, Inc. 201-472-4720
NM Albuquerque, Kanouse-Harper & Assocs. 505-883-0999
NC Charlotte, Cartwright & Bean, Inc. of GA. 704-536-0303
NC Raleigh, Cartwright & Bean, Inc. of GA. 919-876-4130
OH Dayton, Shamrock Elctrn. Sls., Inc. 513-258-1227
PA Landsdowne, Pollart Elctrl. Sls. 609-456-0902
TN Knoxville, Cartwright & Bean, Inc. of GA. 615-693-7450
TN Memphis, Cartwright & Bean, Inc. of TN. 901-362-8345
TX Houston, Burrus & Matthews, Inc. 713-659-3511
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IL Westmont, Insulation Prods. 312-852-5737
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MO St. Louis, Engineered Fasteners 314-434-2888
MO St. Louis, Franklin Elctrns. 314-993-5333
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NM Albuquerque, Walker Elctrns. 505-883-2992
NY Deer Park, BJG Elctrns. 516-586-8668
OH Twinsburg, Schuster Elctrns. 216-425-8134
OK Moore, Spectro Wire & Cable 405-793-9715
OR Clackamus, Larsco 503-655-1931
PA Philadelphia, Billows Elec. 215-332-9700
SC Charleston, Whisle. Indl. Elctrns. 803-722-2634
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TX Houston, Rainbow Fasteners 713-957-0500
UT Salt Lake City, Alpine Supply 801-972-0477

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ALPHA COMPONENTS, 1106 E. Simpson Rd., Mechanicsburg, PA 17055, Tel: 717-697-8595, FAX: 717-697-8608; FSC No.: 52748; *Sls. Mgr.:* Jerry Buckwalter

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CA Laguna Hills, Bayshore Microwave, Inc. 714-768-3680
CA San Jose, Bayshore Microwave, Inc. .. 408-434-6848
CO Boulder, Herb Bass Assocs. 303-530-7509
MD Towson, Dickison Sls. Co. 301-823-0923
NY Rochester, H. C. Johnson Agencies ... 716-586-0777
PA Broomall, SWR Tech, Inc. 215-353-6639

ALPHA DATA INC., 20750 Marilla St., Chatsworth, CA 91311, Tel: 818-882-6500, TWX: 910-494-4914, FAX: 818-407-0258; FSC No.: 7025; Empl.: 30

ALPHA DIST. CORP., 3554 Brecksville Rd., Richfield, OH 44286, Tel: 216-659-7100, FAX: 216-659-3435

ALPHA INDUSTRIES, INC., 20 Sylvan Rd., Woburn, MA 01801, Tel: 617-935-5150, TELEX: 949436, TWX: 710-393-1236; FSC No.: 17540; Empl.: 1400; *Sls. Mgr.:* Nick Bishop

ALPHA-M CORP., 11518 Reeder Rd S.W., 115, Dallas, TX 75229, Tel: 214-406-0424; Empl.: 8; *Sls. Mgr.:* W. L. Cowley

ALPHA METALS, 600 Rte 440, Jersey City, NJ 07305, Tel: 201-434-6778, FAX: 201-434-7508; Empl.: 350; *Sls. Mgr.:* Dave Zerfoss, VP Sls.

ALPHA PRODUCTS, INC., 5740 Corsa Ave. 0104, Westlake Village, CA 91362, Tel: 818-889-9304, TELEX: 65-9210, FAX: 818-706-8986

ALPHA-TECH INC., P.O. Box 209, Riverdale, NJ 07457, Tel: 201-831-1222; Empl.: 8; *Sls. Mgr.:* M. Rice

ALPHA TECHNOLOGIES, 3767 Alpha Way, Bellingham, WA 98226-8302, Tel: 206-647-2360, 206-671-7703, FAX: 206-671-4936; Empl.: 100; *Sls. Mgr.:* Robert A. Bridge; *Dist. Mgr.:* Mark Beckley

ALPHA THERMISTOR, INC., 7181 Construction Ct., San Diego, CA 92121, Tel: 619-549-4660, FAX: 619-549-4791; Empl.: 30; *Sls. Mgr.:* Denise N. Winter

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ALPS ELECTRIC (USA), INC., 3553 N. First St., San Jose, CA 95134, Tel: 408-432-6000, FAX: 408-432-6035(37); Empl.: 7000; *Sls. Mgr.:* Mattie Alesi,

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CT Yalesville, JMG, Inc. 203-284-9049
GA Norcross, Jack Harvey & Assocs. 404-449-4643
IL Arlington Hgts., Micro Sls. 312-956-1000
IN Indianapolis, Jack Harvey & Assocs. .. 317-872-1031
KS Kansas City, BC Electronic Sls. 913-342-1211
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KY Prospect, Jack Harvey & Assocs. 502-228-4100
MA Norwood, JMG, Inc. 617-762-5333
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MN Minneapolis, PSI 612-944-8545
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OR Beaverton, Venture 503-626-7418
TN Knoxville, Jack Harvey & Assocs. 615-524-7057
TX Dallas, Norcom 214-386-4888
WA Bellevue, Venture Elctrns. 206-454-4594
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Can Quebec, Vitel Electronics 514-636-5951

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CA Newport Bch., SPA 714-863-1193
CA San Diego, Miner Assocs., Inc. 619-566-9891
CO Denver, Moss Mktg. 303-455-7205
GA Norcross, Hollingsworth & Still, Inc. ... 404-447-1700
IL Park Ridge, G. McL. Cole Co. 312-692-6040
IN Indianapolis, Elctrn. Mktg. Consits., Inc. 317-253-1668
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NY E. Syracuse, Nycom, Inc. 315-437-8343
NY Hauppauge, Masin-Esco, Inc. 516-273-3500
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VA Herndon/Reston, Stinson Assocs. 703-620-0088, 703-620-0087
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ALUMINUM FILTER, 1000 Cindy Lane, Carpinteria, CA 93013, Tel: 805-684-7651, TELEX: 6713624, FAX: 805-684-3654; FSC No.: 17504; Empl.: 120; *Sls. Mgr.:* B. L. Baker

ALUSETT U.S.A., INC., 3 Cecilia Lane, Pleasantville, NY 10570, Tel: 914-747-3477, FAX: 914-769-5276; Empl.: 35

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CA San Carlos, Electronic Engrg. Assoc. .. 415-593-2189
MO St. Louis, ATECH 314-576-2884
OR Portland, SPS Elctrns. 206-323-4140
TX Dallas, Seaton Corp. 214-980-9860
TX Houston, Seaton Corp. 713-731-2649
WA Redmond, SPS Elctrns. 206-323-4140

AMBI-TECH INDS., 319 Knickerbocker Ave., Hillsdale, NJ 07642, Tel: 201-666-0504, FAX: 201-666-0597; Empl.: 20; *Sls. Mgr.:* Al Nagler; *Dist. Mgr.:* Al Nagler

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CA	San Diego, The Knight Co.	619-452-7196
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FL	Tampa, Temco Sls. Inc.	813-855-7566, 800-282-6815
GA	Atlanta, Kemp Instrs.	404-452-8050
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IN	Ft. Wayne, Walter W. Bieberich	219-432-2537
IA	Davenport, Rush & West	319-388-9494
KS	Olathe, Rush & West	913-764-2700
LA	Lafayette, Kemp Engrg.	318-269-9452
MD	Silver Spring, L. G. White & Co.	301-434-1555
MA	Wakefield, Instr. Dynamics	617-245-5100
MI	Livonia, Electro Sls. Assocs.	313-421-7500
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NY	New Hartford, Reagan/Compar, Inc.	315-732-3775
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NC	Raleigh, L. G. White & Co.	919-872-6049
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OH	Chesterland, Electro Sls. Assocs.	216-729-0190
OH	Dayton, Electro Sls. Assocs.	513-426-5551
OK	Tulsa, Kemp Engr.	918-663-4501
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PA	Pittsburgh, Electro Sls. Assocs.	412-322-9000
SC	Greenville, L. G. White & Co.	803-271-0630
TX	Addison, Kemp Engrg.	214-931-7100
TX	Austin, Kemp Engrg.	512-263-3322
TX	Houston, Kemp Engrg.	713-466-1465
VA	Ashland, L. G. White & Co.	607-752-7055
WA	Redmond, Eclipse Mktg. Grp.	206-885-6991
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EXP	NJ, Mahwah, Intl. Sls. Div.	201-825-0473

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OH	Dayton, Components, Inc.	513-436-0255

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CA	San Diego, Southland	619-578-6634
CA	San Jose, Erie Elctrns.	408-432-1111
CA	San Jose, Passive Technlg.	408-435-5566
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NJ	Parsippany, Fabe Electro Sls., Inc.	201-299-1123
NJ	Rockaway, NASCO Electronics	201-625-7777
NY	Dewitt, Cronin Electronics	315-433-0033
NC	Raleigh, Comp. Dists.	919-787-7311
OR	Beaverton, Murphy Elctrns.	503-642-2001
TX	Dallas, Components Distributors	214-644-0374
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CO	Boulder, Stratford Grp.	303-530-3194
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GA	Marietta, Tenn Tech	404-971-1419
IL	Wheaton, Chadra-Schilke	312-653-8126
IN	Acton, Nationwide Comps.	317-872-7207
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MA	Andover, Crawford Assocs.	617-470-2122
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TX	Dallas, Allied Comps.	214-238-0408
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EXP	CT/Litchfield, Intrade	203-567-5901

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CA	Sunnyvale, PSC	408-737-1333
CA	Tustin, Western Switch & Controls	714-731-4333
CO	Englewood, Indelco	303-694-9444
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CT	Wallingford, Mid-State Elctrns.	203-265-9900
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FL	Ft. Lauderdale, Brothers Elctrns.	305-561-6700
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FL	Oakland Pk., Zelcon	305-565-2555
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IA	W. Des Moines, Ramco Co.	515-225-6933
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FL	Lighthouse Pt., R. C. Simon & Co., Inc.	305-941-2757
GA	Lawrenceville, M. Lader Co.	404-264-8111
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KS	Lenexa, Midwest Tech. Sls., Inc.	913-888-5100
MD	Columbia, M. Lader Co.	301-381-1550
MA	Topsfield, R.F. Assocs.	508-887-9762
MN	New Brighton, TWC Sls.	612-636-1770
MO	St. Charles, Midwest Tech. Sls., Inc.	314-441-1012
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NM	Albuquerque, Bestech Elec. Comp. Sls.	505-298-0034
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CA	San Diego, Cetinske Sls. Co.	619-487-3335
CA	San Jose, Arnold Tech. Sls., Inc.	408-954-0400
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IL	Arlington Hgts., KMA Sls. Co.	312-398-5300
IN	Carmel, Berndt Assocs.	317-844-0114
KS	Overland Pk., AME Sls.	913-262-3971
MD	Gaithersburg, Naudain Assocs. So. Inc.	301-258-5040
MA	Taunton, Focus Elctrn. Sls., Inc.	508-824-3840
MI	Ypsilanti, Techrep, Inc.	313-572-1950
MN	Minneapolis, R.W. Marshall Co.	612-929-0457
MO	St. Charles, AME Sls.	314-947-0333
NJ	Marlton, Naudain Assocs., Inc.	609-983-5300
NJ	Rahway, R. E. Breuer Co., Inc.	201-388-5045
NM	Albuquerque, Thorson Desert States, Inc.	505-293-8555
NY	Alexander, Union Mktg. Grp.	716-591-1219
NY	Port Chester, R. E. Breuer Co. Inc.	914-939-3887
NY	Rochester, Union Mktg. Grp.	716-546-7820
NY	S. Farmingdale, R. E. Breuer Co., Inc.	516-694-6597
NC	Wake Forest, Mountain Electro, Inc.	919-556-7103
OH	Cincinnati, Makin & Assocs.	513-871-2424
OH	Columbus, Makin & Assocs.	614-848-5424
OH	Solon, Makin & Assocs.	216-248-7370
OR	Beaverton, Thorson Co. N.W.	503-644-5900
TX	Irving, AID Elctrns.	214-790-4761
TX	Irving, EDC	214-257-0322
UT	Midvale, Luscombe Engrg. Co.	801-565-9885
WA	Bellevue, Thorson Co. N.W.	206-455-9180
WI	Milwaukee, KMA Sls. Co.	414-259-1771
Can	Mississauga, Ontario, LCC Technlgs., Inc.	416-897-7571

Local Distributors

AL	Huntsville, Electro-Wise	205-721-0773
AZ	Tempe, Acacia Elctrns.	602-894-2874
CA	Buena Pk., Cypress Elctrns.	714-521-5230
CA	Fountain Valley, Components Ctr.	714-979-0433
CA	San Diego, Cypress Elctrns.	619-535-0011
CA	Santa Clara, Components Ctr.	408-988-3751
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CA	Santa Monica, Master Distrs.	213-452-1229
CO	Englewood, Cypress Elctrns.	303-792-5829
CO	Lakewood, Acacia Elctrns.	303-232-2882
CT	E. Haven, J V Elctrns.	203-469-2321
CT	Wallingford, The Greene-Shaw Co.	203-265-3333
FL	Ft. Lauderdale, Time Elctrns.	305-484-7778
FL	Orlando, Time Elctrns.	407-841-6565
IL	Lisle, Comps., Inc.	312-852-7707
IN	Carmel, Altex Elctrns.	317-848-1323
MD	Jessup, Treeko Sls., Inc.	301-470-3300
MD	Savage, Pyttronic Inds.	301-953-9650
MA	Peabody, Time Elctrns./New Eng.	617-532-6200
MN	Eden Prairie, Cypress Elctrns.	612-934-2104
MN	New Brighton, Chris Elctrns. Distrs.	612-631-2647
MO	St. Louis, Time Elctrns.	314-391-6444
NJ	Oakland, Relay Spec.	201-337-1000
NJ	W. Berlin, General Comps., Inc.	609-768-6767
NY	Buffalo, Genesee Indl. Elctrns.	716-873-9661
NY	Farmingdale, Pride Elctrns.	516-293-4020
NC	Raleigh, Resco/Raleigh	919-781-5700
OH	Centerville, Altex Elctrns.	513-436-0067
OH	Dublin, Time Elctrns.	614-761-1100
OR	Beaverton, Acacia Sls.	503-646-3377
PA	Montgomeryville, Pyttronics Inds.	215-643-2850
TX	Dallas, Cypress Elctrns.	214-869-1435
TX	Dallas, Wallace Elctrns.	214-340-0400
TX	Richardson, RSC Elctrns.	214-644-3444
WA	Redmond, Time Elctrns.	206-882-1600
WI	Milwaukee, Progressive Image	414-321-4722

AMETEK CONTROLS DIV., Ametek Fiber Optic Products, 820 Pennsylvania Blvd, Feasterville, PA 19047, Tel: 215-355-6900, TELEX: 29-1769, FAX: 215-355-2937; Empl.: 100; *Sls. Mgr.:* Jon Koval, Bus. Unit Mgr.

AMETEK, INC., Mansfield & Green Div., 8600 Sunset Dr., Largo, FL 34643, Tel: 813-536-7831, FAX: 813-539-6882; Empl.: 120; *Sls. Mgr.:* Gary Queensberry

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AMILON CORP., 49-12 30th Ave., Woodside, NY 11377, Tel: 718-274-1794, TELEX: 4972608, FAX: 718-278-5621; Empl.: 50; *Sls. Mgr.:* L. Rosenblatt

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FAX: 508-686-0622

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AZ	Tempe, Cain Technlg.	602-966-4322
CA	Orange, Cain Technlg.	714-997-7311
CA	San Jose, Precision Svcs.	408-996-2808
CA	Van Nuys, Cain Technlg.	818-904-9392
CO	Englewood, Cain Technlg.	303-220-8118
CT	Wethersfield, Compak, Inc.	203-563-4784
FL	Melbourne Bch., Millett Assocs.	305-725-5055
MD	Columbia, PSA	215-245-0513
MA	Hudson, Compak, Inc.	617-568-0331
PA	Trevose, PSA	609-234-0661
NY	Hicksville, L-Tronix	516-935-0220
TX	Plano, BK Assocs.	214-437-4153
VA	Lynchburg, PSA	215-245-0513
VA	Oakton, PSA	215-245-0513

Local Distributors

MA	Stoneham, East Coast Microwave	617-279-0900

AMKEY, 55 Chase St., Methuen, MA 01844, Tel: 508-975-5445, FAX: 508-975-0357; Empl.: 35; *Sls. Mgr.:* Philip P. Bodoni; *Dist. Mgr.:* Philip P. Bodoni ..... **B•1856-1857**

Local Sales Offices & Reps

CA	San Diego, Mesa Comps.	619-278-8021
IN	Ft. Wayne, R. L. Bontempo Assocs., Inc.	219-478-1057

AMLAN, INC., 97 Thornwood Rd., Stamford, CT 06903, Tel: 203-322-1913, TELEX: 643647, FAX: 203-322-7648; *Sls. Mgr.:* Mark Landeweer; *Dist. Mgr.:* Mark Landeweer

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IL Schaumburg, AMP 312-351-5020
TX Irving, AMP 214-550-1114

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TX Austin, Hamilton/Avnet Elctms. 512-837-8911
AZ Chandler, Hamilton/Avnet Elctms. 602-961-6400
NJ Cherry Hill, Hamilton/Avnet Elctms. 609-424-0110
MD Columbia, Hamilton/Avnet Elctms. 301-995-3500
NC Greenboro, Hammond Elctms. 919-275-6391
PA Horsham, Schweber Elctms. 215-441-0600
MA Peabody, Hamilton/Avnet Elctms. 617-531-7430
CA Sacramento, Hamilton/Avnet Elctms. 916-925-2216
CA Santa Clara, Cypress Elctms. 408-980-2500
CA Sunnyvale, Hamilton/Avnet Elctms. 408-743-3427
CT Wallingford, Marshall Inds. 203-265-3822
AL Huntsville, Hamilton/Avnet 205-837-7210
AL Huntsville, Marshall 205-881-9235
AL Huntsville, Powell Elctms. 205-539-2731
AL Huntsville, Time Elctms. 205-721-1133
AZ Phoenix, Dalis Elctm. Supp. 602-275-2885
AZ Phoenix, Marshall 602-496-0290
AZ Phoenix, Sterling Elctms. Corp. 602-268-2121
AZ Tempe, Time Elctms. 602-967-2000
CA
CA Anaheim, Time Elctms. 714-937-0911
CA Buena Pk., Cypress 714-521-5230
CA Chatsworth, Hamilton Avent Elctms. 818-700-1222
CA Chatsworth, Marshall Inds. 818-407-4100
CA Chatsworth, Time Elctms. 818-998-7200
CA Costa Mesa, Avnet Inc. 714-754-6100
CA Costa Mesa, Hamilton/Avnet 714-641-4199
CA Culver City, Avnet, Inc. 213-558-2123
CA El Monte, Marshall Inds. 818-459-5500
CA Fountain Valley, Comps. Ctr, Inc. 714-979-0433
CA Fullerton, Pyramid Elctms. 714-773-0781
CA Gardena, Hamilton/Avnet 213-615-3900
CA Gardens, CA Switch & Signal 213-770-2330
CA Hawthorne, Electro-Sonic Comps. 213-970-0997
CA Irvine, Marshall Inds. 714-458-5314
CA Irvine, Schweber Elctms. 714-863-0200
CA Manhattan Bch., Prime Electro Prods. Co. 213-379-3642
CA Milpitas, Marshall Inds. 408-943-4600
CA Milpitas, Zack Elctrns., Inc. 408-942-5432
CA Monrovia, Erik-A-Elctms. 818-574-1020
CA North Hollywood, Alatec Prods. 213-875-1790
CA Ontario, Hamilton/Avnet Elctms. 714-989-8818
CA Placentia, Telasia Elctms., Inc. 714-579-7555
CA Rancho Cordova, Marshall Inds. 916-635-9700
CA Sacraminto, Zack Elctms., Inc. 916-446-3131
CA San Diego, Cypress 619-535-0011
CA San Diego, Hamilton Avnet Elctms. 619-571-7525
CA San Diego, Marshall Elctms. Grp. 619-578-9600
CA San Diego, Time Elctms. 619-586-1331
CA San Diego, Western Micro Technig., Inc. 619-453-8430
CA San Francisco, Zack Elctms., Inc. 415-626-1444
CA San Jose, Powell Elctms. 408-943-9020
CA Santa Clara, Comps. Ctr, Inc. 405-988-3751
CA Santa Clara, Pyramid Elctms. 408-727-9810
CA Sunnyvale, Time Elctms. 408-734-9888
CA Torrance, Kent Elctms. Corp. 213-320-2700
CA Torrance, Time Elctms. 213-320-0880
CO Colorado Springs, Hamilton/Avnet Elctms. 303-637-0055
CO Denver, CSID, Inc. 303-292-9594
CO Englewood, Hamilton Avnet Elctms. 303-740-1000
CO Englewood, Time Elctms. 303-799-8851
CO Thornton, Marshall Inds. 303-451-8383
CT Cheshire, Time Elctms. 203-271-3200
CT Danbury, Hamilton/Avnet 203-797-2842
CT Wallingford, ALMO Elctms., Inc. 203-269-6801
CT Wallingford, Cronin Elctms. 203-265-3134
CT Wallingford, Marshall Inds. 203-265-3822
FL Altamonte Springs, Marshall Inds. 305-767-8585
FL Altamonte Springs, Schweber Elctms. 305-331-7555
FL Ft. Lauderdale, Hamilton/Avnet 305-979-2802
FL Ft. Lauderdale, Hammond Elctms., Inc. 305-973-7103
FL Ft. Lauderdale, Marshall 305-977-4880
FL Ft. Lauderdale, Time Elctms. 305-484-7778
FL Orlando, Hammond Elctms. 305-849-6060
FL Orlando, Time Elctms. 407-841-6565
FL St. Petersburg, Hamilton/Avnet 813-576-3930
FL Winter Pk., Hamilton/Avnet 305-628-3888
GA Atlanta, Electro Air Corp. 404-351-3545
GA Norcross, Hamilton/Avnet 404-447-7500
GA Norcross, Hammond 404-449-1996
GA Norcross, Marshall 404-923-5750
GA Norcross, Schweber Elctms. Corp. 404-446-5842
GA Norcross, Time Elctms. 404-448-4448
ID Boise, Kimball Elctms. 208-342-3559
IL Addison, LCOMP, Inc. 312-628-1400
IL Bensenville, Hamilton Avnet Elctms. 312-860-8564
IL Elk Grove, Schweber Elctms. Corp. 312-364-3750
IL Elmhurst, Semiconductor Spec. 312-279-1000
IL Palatine, OHM Elctms., Inc. 312-359-5500
IL Schaumberg, Marshall 312-490-0755
IL Wheeling, Hawk Elctms. 312-459-4030
IL Wood Dale, Time Elctms. 312-350-0610
IN Carmel, Hamilton/Avnet 317-844-9333
IN Indianapolis, Bell Inds. Inc. 317-875-8200
IN Indianapolis, Marshall 317-297-0483
IA Cedar Rapids, Hamilton/Avnet 319-362-4757
KS Edwardsville, Schweber Elctms. 913-441-1801
KS Lenexa, Marshall 913-492-3121
KS Overland Pk, Hamilton Avnet Elctms. 913-888-8900
KY Lexington, Hamilton/Avnet Elctms.-IBM 606-259-1473
MD Columbia, Powell Elctms. 301-995-6410
MD Columbia, Time Elctms. 301-963-3090
MD Gaithersburg, MS Elctms. 301-921-0200
MD Silver Springs, Marshall Inds. 301-622-1118
MA peabody, Hamilton/Avnet Elctms. 617-596-7860
MA Andover, Bell Inds., Inc. 603-882-1133
MA Needham, Cronin Elctms. 617-449-5000
MA Peabody, Time Elctms. 508-532-6200
MA Wilmington, Marshall Inds. 617-658-0810
MA Winchester, Bell Industries, Inc. 617-729-5800
MI Grand Rapids, Hamilton/Avnet 616-243-6178
MI Livonia, Chelsea Inds. 313-525-1155
MI Livonia, Marshall 313-525-5850
MI Novi, Hamilton Avnet Elctms. 313-522-4700
MN Edina, Time Elctms. 612-835-1250
MN Minnetonka, Hamilton/Avnet 612-932-0600
MN Plymouth, Marshall 612-559-2211
MN St. Paul, Gopher Elctms. Co., Inc. 612-483-3322
MO Bridgetown, Marshall Inds. 314-291-4650
MO Earth City, Hamilton Avnet Elctms. 314-344-1200
MO St. Charles, Lectronix 314-946-6424
MO St. Louis, Time Elctms. 314-391-6444
NH Manchester, Cronin Elctms. 603-624-0105
NH Manchester, Hamilton Avnet Elctms. 603-624-9400
NY Buffalo, Summit Distrs. 716-887-2800
NJ Camden, G.R.S. Elctms., Inc. 609-964-8560
NJ Fairfield, Hamilton Avnet Elctms. 201-575-3490
NJ Fairfield, Marshall Elctms. 201-882-0320
NJ Kenilworth, Federated Purchaser 201-272-0505
NJ Mt. Laurel, Marshall Inds. 609-234-9100
NJ Old Bridge, BTC, Inc. 201-679-9300
NJ Pinebrook, Time Elctms. 201-882-4611
NM Albuquerque, Hamilton Avnet Elctms. 505-765-1500
NY Bohemia, March Elctms., Inc. 516-563-6000
NY East Syracuse, Time Elctms. 315-432-0335
NY Elmsford, Ancar Elctms. Supp., Inc. 914-592-7100
NY Fairport, Time Elctms. 315-432-0355
NY Farmingdale, Pride Elctms., Inc. 516-293-4020
NY Hauppage, Marshall Inds. 516-273-2424
NY Hauppauge, Hamilton/Avnet 516-231-9800
NY Hauppauge, Time Elctms. 516-273-0100
NY Hempstead, Davis Elctms. Corp. 516-483-9200
NY Johnson City, Help Elctms. 607-729-3528
NY Johnson City, Marshall 607-798-1611
NY Lynbrook, Peerless Elctms. 516-593-2121
NY Rochester, Hamilton/Avnet 716-475-9130
NY Rochester, Marshall Inds. 301-235-7620
NY Rochester, Masline Elctms., Inc. 716-546-5373
NY Rome, Rome Elctms., Inc. 315-337-5400
NY Syracuse, Hamilton Avnet Elctms. 315-437-2641
NY West Babylon, Delmar Elctms. 516-420-1234
NY Westbury, Schweber Elctms. Corp. 516-334-7474
NC Charlotte, Time Elctms. 704-522-7600
NC Greensboro, Hammond Elctms., Inc. 919-275-6391
NC Raleigh, Hamilton Avnet Elctms. 919-878-0819
NC Raleigh, Marshall 919-878-9882
NC Raleigh, Southeastern Elctms. 919-828-2311
OH Akron, AESCO Elctms. 216-762-8818
OH Cincinnati, Schuster Elctms., Inc. 513-489-1400
OH Columbus, Elctm. Mktg. Corp. 614-299-4161
OH Dayton, Bell Inds. 513-435-8660
OH Dayton, Hamilton/Avnet 513-439-6700
OH Dayton, Marshall 513-898-4480
OH Dublin, Time Elctms. 614-761-1100
OH Solon, Hamilton/Avnet 216-349-5100
OH Solon, Marshall Inds. 216-248-1788
OH Twinsburg, Schuster Elctms., Inc. 216-425-8134
OH Westerville, Hamilton/Avnet 614-882-7004
OK Tulsa, Hamilton/Avnet 918-252-7297
OR Beaverton, Marshall 503-644-5050
OR Lake Oswego, Hamilton-Avnet Elctms. 503-635-8157
OR Portland, Radar Elec. Co., Inc. 503-233-3691
OR Portland, Time Elctms. 503-684-3780
PA Allentown, P. A. Peters, Inc. 215-434-5237
PA Essington, Tri-Com, Inc. 215-521-3080
PA Horsham, Schweber Elctms. Corp. 215-441-0600
PA King of Prussia, Time Elctms. 215-337-0900
PA Mars, ALMO Elctms., Inc. 412-776-9090
PA Philadelphia, Almo Elctms. Corp. 215-698-4000
PA Philadelphia, Powell Elctms. 215-365-1900
PA Pittsburgh, Hamilton/Avnet 412-281-4150
PA Wayne, Peek Elctms., Corp. 215-293-9000
SC Greenville, Hammond Elctms., Inc. 803-233-4121
TX Austin, Kent Elctms. Corp. 512-834-1900
TX Austin, Marshall 512-895-9200
TX Austin, Time Elctms. 512-339-3051
TX Carrollton, Connec/Tek, Inc. 214-733-4411
TX Carrollton, Marshall Inds. 214-770-0600
TX Carrollton, Time Elctms. 214-241-7441
TX Dallas, Sterling Elctms. Corp. 214-243-1600
TX Dallas, Wallace Elctms., Inc. 214-340-0400
TX El Paso, Ideal Inds. Elctm. Supp. 915-779-6647
TX El Paso, Marshall Inds. 915-593-0706
TX Ft. Worth, G & W Elctms. Supp. 816-831-0395
TX Ft. Worth, TTI Inc. 214-550-2237
TX Houston, Kent Elctms. 713-780-7770
TX Houston, Marshall 713-895-9200
TX Irving, Hamilton/Avnet Elctms. 214-659-4100
TX Richardson, Kent Elctms. Corp. 214-669-2600
TX Stafford, Hamilton-Avnet Elctms. 713-240-7898
UT Salt Lake City, Hamilton Avnet Elctms. 801-972-4300
UT Salt Lake City, Kimball Elctms. 801-328-2075
UT Salt Lake City, Marshall 801-485-1551
UT West Valley City, Time Elctms. 801-973-8181
VA Richmond, Sterling Elctms. Corp. 804-226-2190
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WA Redmind, Pyramid Elctms. Supp., Inc. 206-872-5800
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WA Redmond, Time Elctms. 206-882-1600
WA Seattle, Radar Elec. Co., Inc. 206-282-2511
WA Spokane, Radar Elec. Co., Inc. 509-747-3053
WI Milwaukee, Marsh Elctms., Inc. 414-475-6000
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CO Denver, Amperex Sls. Corp. 303-989-7310
FL Clearwater, HHP Assocs., Inc. 813-797-4447
FL Pompano Beach, HHP Assocs., Inc. 305-971-5750
FL Winter Pk., HHP Assocs., Inc. 305-740-0320
GA Atlanta, CSR Elctms., Inc. 404-396-3720
IL Wood Dale, Amperex Sls. Corp. 312-860-7373
IN Indianapolis, Leslie M. DeVoe Co. 317-842-3245
KS Shawnee Mission, Lowell-Kangas & Assoc. 913-631-3515
PA W. Conshohocken, Eastern Comps. Sls. Corp. 800-223-3851
MA Norwood, Amperex Sls. Corp. 617-769-6940
MI Farmington Hills, R. C. Merchant & Co., Inc. 313-476-4600
MI St. Joseph, R. C. Merchant & Co., Inc. 616-983-7378
MN Eden Prairie, Comprehensive Tech. Sls. 612-941-7181
MO St. Louis, Lowell-Kangas & Assocs. 314-821-4050
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NY Utica, Tech-Mark, Inc. 315-733-0575
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NC Raleigh, CSR 919-878-9200
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PA Willow Grove, Amperex Sls. Corp. 215-659-6096
TN Knoxville, CSR Elctms. 615-577-1317
TX Dallas, Amperex Sls. Corp. 214-231-3481
WA Bellevue, Western Tech. Sls. 206-641-3900
WA Spokane, Western Tech. Sls., Inc. 509-922-7600

Local Distributors

CA Anaheim, Pacesetter Elctms. 714-779-5855
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CA Tustin, AVED, Inc. 714-259-8258
CO Denver, IEC 303-292-6121

CT Wallingford, Greene-Shaw 203-265-3333
FL Orlando, Hammond Elctrns. 305-849-6060
IL Elmhurst, Semiconductor Specialists 312-279-1000/5
IL Schaumburg, QPS Elctrns. 312-884-6620
IN Indianapolis, Mar Elctrns. 317-633-6699
IA Cedar Rapids, Dee Elctrns. 319-365-7551
MA Wilmington, Northstar Elctrns. 508-657-5155
MI Livonia, Chelsea Inds., Inc. 313-525-1155
MN Minneapolis, Sterling Elctrns. 612-831-2666
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NY Plainview, ACI Elctrns. .. 516-293-6630,212-591-4045
NC Raleigh, Sager/Service Plus 919-850-9550
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PA McKean, Advacom, Inc. 814-476-7774
TX Austin, Aved 512-454-8845

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CA Los Altos 415-969-1445
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IL St. Charles 312-377-3050
IN Ft. Wayne 219-486-7412
MD Severna Pk. 301-647-3879
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MO St. Charles 314-724-6460
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TX Dallas 214-343-8420

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KS Edwardsville, Tennant Elctrns. 913-441-1801
NY Westbury, Schweber Elctrns. 516-334-7474
PA Philadelphia, Power Elctrns. 215-365-1900
TX Dallas, Hall-Mark Elctrns. 214-343-5000

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Local Sales Offices & Reps
CA San Jose, Quad Rep 408-432-3300
FL Orlando, Sunland Assocs. 407-365-9533
GA Norcross, Electramark 404-446-7915
IL Arlington Hgts., Brainard-Wilson 312-437-2700
IN Ft. Wayne, Outman Sls. 219-483-7879
MD Columbia, Components & Assemblies 301-381-1800
MA Tewksbury, Sequel Assocs. 617-851-4010
NM Albuquerque, Reptronix Ltd. 505-292-1718
NY Manlius, Lamtec 315-637-3738
NY Port Washington, Ashtec 516-767-0336
NC Raleigh, Prime Comps. 919-850-9866
OR Portland, QR/Crown 503-620-8320
TX Dallas, Ammon & Rizos 214-644-5591

AMPHENOL INTERCONNECT PRODUCTS, 20 Valley St., Endicott, NY 13760, Tel: 607-754-4444, FAX: 607-754-4444; FSC No.: 13509; *Sls. Mgr.:* Robert Anderson; *Dist. Mgr.:* Robert Anderson ..... **C•1266**

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AZ Phoenix, O'Donnell Assocs. S.W., Inc. 602-994-9542
CA Calabasas, Quadrep Southern, Inc. ... 818-887-3711
CA Santa Clara, Quad Rep 408-432-3300
CO Colorado Springs, Amphenol Corp. 717-599-8951
FL Maitland, Hutto-Hawkins Assocs. 305-831-2474
MN Minneapolis, Des. Technlg. 612-424-7605
IN Indianapolis, L. M. Devoe 317-842-3245
MD Columbia, Comps. & Assemblies 301-381-1800
MA Marlboro, Amphenol Corp. 617-481-2820
MI Farmington Hills, R. C. Merchant & Co., Inc. 313-475-4600
NY Babylon, Astro Rep 515-422-2500
NY Fairport, Lamtec 716-377-1210
OH Cleveland, K. T. Depco 216-442-6200
OR Portland, QR/Crown, Inc. 503-620-8320
TX Richardson, Ammon & Rizos 214-644-5591
PR Guaynabo, Isla Caribe Electro Sls. 809-720-1097

AMPHENOL RF OPERATIONS, Amphenol Corporation, One Kennedy Avenue, Danbury, CT 06810, Tel: 203-743-9272, FAX: 203-796-2032; FSC No.: 74868; Empl.: 600; *Sls. Mgr.:* J. D. Norwood; *Dist. Mgr.:* H. Blumenschein ..... **C•1266**

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AZ Tempe, Reptronix Ltd. 602-345-4580
CA Irvine, QuadRep Southern 714-727-4222
CA San Diego, QuadRep Southern 619-560-8330
CA San Jose, QuadRep Inc. 408-432-3300
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OH Columbus, Baehr Greenleaf & Assoc. 614-847-0220
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TX Dallas, Ammon & Rizos 214-644-5591
TX Houston, Ammon & Rizos 713-781-6240
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MO St. Charles, Midwest Tech. Sls. 314-441-1012
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NY Fairport, Lamtec, Inc. 716-377-1210
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CA N. Hollywood, O'Halloran Assoc. 213-877-0173
CA Palo Alto, O'Halloran Assoc. 415-969-1600
CO Boulder, H. Bass. Assoc. 303-530-7509
CT Hamden, J.B.L. Assoc. 203-281-3161
FL Ft. Lauderdale, W. A. Brown Instrs., Inc. 305-776-6661
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MD Severna Park, Delmarva Eng. Assoc. Ltd. 301-647-8388
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TX Austin, Airep Elctrns. 512-327-0778
TX Dallas, Airep Elctrns. 214-349-4360
TX Houston, Barmore Assoc. 713-944-8171
UT Bountiful, Herb Bass Assoc. 801-295-7100
WA Seattle, J. J. Assocs., Inc. 206-246-6619

AMPLIFONIX, INC., 2010 Cabot Blvd. West, Langehorne, PA 19047, Tel: 215-757-9600, FAX: 215-757-0378; FSC No.: 60979; Empl.: 60; *Sls. Mgr.:* Richard P. Dubois; *Dist. Mgr.:* Richard P. Dubois

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AMRAD & TRANSCON MFG. CO., Div. of D.J. Assocs., Inc., 8411 South Zero St, Fort Smith, AR 72903-7045, Tel: 501-452-3987, TELEX: 3791705 DJ USA, FAX: 501-452-7752; FSC No.: 55943; Empl.: 17; *Sls. Mgr.:* M. P. Beck; *Dist. Mgr.:* M. P. Beck

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CA La Canada, C.E.M., Inc. 818-790-8358
CA San Diego, C.E.M., Inc. 619-268-8911
CA San Diego, C.E.M., Inc. 619-692-3551
CA Santa Ana, C.E.M., Inc. 714-835-2702
CO Wheatridge, Waugaman Assocs., Inc. 303-423-1020
CT Meriden, MPS Elctrns. 203-235-1414
FL Melbourne, Reynolds & Assocs., Inc. 800-255-1965,407-259-7000
MD Baltimore, Muncy Sls. 301-484-6376
MA Norwood, MPS Elctrns. 617-769-8700
NJ Pennsauken, J.A. Maguire & Co. Inc. .. 609-665-5136
NM Albuquerque, Shefler Kahn Co. 505-296-0749
NY Yonkers, Sonkin Assocs. 914-968-8282
OH Kettering, F.L.Ohmer & Assoc. 513-434-1454
OR Tigard, Rep-West, Inc. 503-639-0325
PA Philadelphia, J.A. Maguire & Co. 215-627-1670
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TX Rockwall, Eatman Engrg. 214-771-1903
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ANACOM, 1335 S. Claudina, Anaheim, CA 92805, Tel: 714-774-8080, FAX: 714-774-7388

ANADEX INC., 1080 Avenida Acaso, Camarillo, CA 93010, Tel: 805-987-9660, TWX: 910-494-2761, FAX: 805-388-0133; Empl.: 15; *Sls. Mgr.:* Ken Mathews

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AL Huntsville, Currie, Peak & Frazier 205-536-1506
AZ Rustco Entprs. 602-263-0501
CA Canoga Pk., FLW, Inc. 818-719-0037
CA Carlsbad, FLW, Inc. 619-434-5251
CA Costa Mesa, FLW, Inc. 714-751-7512
CA Fremont, FLW, Inc. 415-651-6511
CT Wallingford, Pat Jenks Assocs. 203-265-9939
FL Orlando, Currie, Peak & Frazier 407-855-0843
GA Duluth, Currie, Peak & Frazier 404-497-9404
IL Arlington Hgts., Comtel Midwest 312-392-4040
IN Independance, WKM Assocs. 216-524-5930
IN Indianapolis, Comtel Midwest 317-253-1681
KS Shawnee Mission, Comtel Midwest ... 913-268-0762
LA Lafayette, Abcor, Inc. 318-237-3865
MA Beverly, Pat Jenks Assocs. 508-921-4600
MI Madison hgts., WKM Assocs. 313-588-2300
MN Wayzata, Comtel Midwest 612-476-1551
MO St. Louis, Comtel Midwest 314-991-5363
NM Albuquerque, Rustco Entprs. 505-293-8620
NY Plainview, Eastern Metro Assoc. 516-931-1414
NC Greensboro, Currie, Peak & Frazier ... 919-373-0380
OH Dayton, WKM Assocs. 513-434-7500
OK Tulsa, Abcor, Inc. 918-743-3249
PA Frazier, FLW Inc. 215-251-9700
TN Nashville, Currie, Peak & Frazier 615-459-0743
TX Dallas, Abcor, Inc. 214-231-8977
TX Houston, Abcor, Inc. 713-486-9251
WI New Berlin, Comtel Midwest 414-544-6042

ANADYNE POWER SUPPLY DIVISION, 14005 Stage Road, Santa Fe Springs, CA 90670-5216, Tel: 213-921-9364, FAX: 213-921-8163; Empl.: 100

ANAHEIM AUTOMATION, 910 E. Orangefair La., Anaheim, CA 92801, Tel: 714-992-6990, TELEX: 2978217 MCI, FAX: 714-992-0471; Empl.: 35

ANALOG & DIGITAL PERIPHERALS, INC.(ADPI), 251 South Mulberry, Troy, OH 45373, Tel: 513-339-2241, TWX: 810-450-2685, FAX: 513-339-0070; FSC No.: 31-0949-745; Empl.: 19; *Sls. Mgr.:* M. J. Keeney

ANALOG DEVICES, INC., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, Tel: 617-329-4700, TWX: 710-394-6577; FSC No.: 24355; Empl.: 5200

ANALOG EQUIPMENT CORPORATION, 5606 PGA Blvd., Palm Bch. Gardens, FL 33418, Tel: 407-622-3715, FAX: 407-622-4799; FSC No.: 67584; *Sls. Mgr.:* V. Ratner

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AZ	Phoenix, Odyssey I	602-246-8846
CA	San Carlos, Western Digital & Instr.	415-591-6535
CA	Tustin, Analogic Corp.	714-543-0616
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FL	Ft. Lauderdale, Analogic Corp.	305-565-4544
FL	Longwood, Southern Mktg. Assoc.	305-682-7317
KY	Florence, Analogic Corp.	606-283-8132
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MI	Plymouth, Analogic Corp.	313-455-6380
MN	Apple Valley, Analogic Corp.	612-432-2111
NJ	Budd Lake, Analogic Corp.	201-347-7477
NM	Albuquerque, Odyssey I	505-265-6645
NY	Bayville, Analogic Corp.	516-628-8640
NY	Frankfort, Kapital Instr. Sls.	315-894-4245
NY	Port Chester, Radiation Elctrns. Inc.	914-937-2300
TX	Dallas, Data Mktg. Assoc.	214-661-0300
UT	Salt Lake City, Odyssey I	801-485-4728
VA	Woodford, Analogic Corp.	804-633-4761
WA	Redmond, Western Rep	206-885-0004
WI	West Bend, Analogic Corp.	414-334-4145

Array Processors

CA	San Jose, Analogic Corp.	408-247-6401
CT	Avon, Power Mark, Inc.	203-678-0123
FL	Cape Canaveral, Analogic Corp	305-799-2300
GA	Lilburn, Micro-Spec	404-921-3840
IL	Rolling Meadows, Commodore I	312-394-5441
IL	Schaumburg, Analogic Corp.	312-882-5880
MD	Columbia, Analogic Corp.	301-596-5512
MA	Brighton, Power Mark, Inc.	617-783-9500
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NJ	Boonton, PAF Assocs.	201-335-0680
NM	Albuquerque, Cleveland Entprs.	505-265-7893
NY	Smithtown, PAF Assocs.	516-360-0940
OH	Chagrin Falls, Midwest Mktg. Assocs.	216-247-6655
OH	Dayton, Midwest Mktg. Assocs.	513-433-2511
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TX	Houston, Analogic Corp.	713-541-5331
Can	Nepean, Ont., Computer Aided Des.	613-225-0411

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FL	Ft. Lauderdale, Analogic Corp.	
IL	Schaumburg, Analogic Corp.	312-882-5880
IN	Indianapolis, RDP Corp.	317-788-4296
MD	Hanover, Commonwealth Controls	301-796-5960
MA	Danvers, Analogic	617-777-4500
MA	Holbrook, McLellan Assocs.	617-767-4771
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MO	Manchester, Control Sys. Des.	314-227-4212
NY	Frankfort, Kapital Instrs.	315-894-4245
NY	NewYork, Flowmaster	212-741-9675
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OH	Dayton, RDP Corp	513-253-6175
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PA	Pitttsburg, RDP Corp.	412-487-2217
TX	Austin, Data Mktg. Assocs.	512-443-7722
TX	Dallas, Data Mktg. Assocs.	214-661-0300
TX	Houston, Data Mktg. Assocs.	713-780-2511
VA	Richmond, Commonwealth Controls	804-271-7700
TX	San Antonio, Data Mktg. Assocs.	512-342-3031
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ANALOGIC/3H, 1701 Rollins Rd., Burlingame, CA 94010, Tel: 408-734-5970, TELEX: 352022, FAX: 408-734-5139; *Sls. Mgr.:* Nabeel Tarazi

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FAX: 407-834-3806

ANALOG MODULES, INC., 126 Baywood Avenue, Longwood, FL 32750, Tel: 407-339-4355, TELEX: ANALOG MOD C1 467617; FSC No.: 61651; Empl.: 38; *Sls. Mgr.:* W. C. Hudson, VP Mktg. ..... **D•1004**

ANALOG SYSTEMS, P.O. Box 17389, Tucson, AZ 85731-7389, Tel: 602-290-1818, TWX: 275008 (RCA); FSC No.: 58976; Empl.: 9; *Sls. Mgr.:* Kelli Dayton; *Dist. Mgr.:* Kelli Dayton

ANALYTIC INSTRUMENTS CORPORATION, P.O. Box 542845, Dallas, TX 75354, Tel: 214-357-3882; Empl.: 15; *Sls. Mgr.:* Carl Dreher

ANAREN MICROWAVE, P.O. Box 178, 6635 Kirkville Rd., E. Syracuse, NY 13057, Tel: 315-432-8909, TELEX: 71-685-4503/4567, TWX: 310-685-4518/4568; FSC No.: 31597; Empl.: 424

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ANCO Electronics Inc.

FAX: 714-989-9935

ANCO ELCTRNS., Pan Intl., 9852 Crescent Center, Rancho Cucamonga, CA 91730, Tel: 714-945-1365; Empl.: 12; *Sls. Mgr.:* Gail Clark; *Dist. Mgr.:* Barry Park, Natl. Sls. Mgr. ..... **C•1766-1767; D•1078**

AND, William J. Purdy Co., 770 Airport Blvd., Burlingame, CA 94010, Tel: 415-347-9916, TELEX: 677-1439, FAX: 415-340-1670; FSC No.: (PURDY UW); Empl.: 30; *Sls. Mgr.:* Clarence Bruce ..... **B•1048-1049, 1129**

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AZ	Phoenix, C. T. Carlberg & Assoc.	602-468-0750
CA	Anaheim, Impact	714-533-9933
CA	Burlingame, William J. Purdy	415-347-7701
CO	Englewood, William J. Purdy Assoc.	303-790-2211
CT	Meriden, Advance Comp. Sls.	203-238-6891
FL	Orlando, Currie, Peak, Frazier	305-855-0843
IL	Elmhurst, F.F./Hill Gray, Inc.	312-832-4101
IN	Indianapolis, John Sukup, Inc.	317-253-5501
MA	Framingham, Gallagher Assocs., Inc.	508-626-2346
MI	E. Detroit, Jack M. Thorpe Co.	313-779-6363
MN	Minneapolis, Hei-Lite Sls.	612-861-6051
MO	Grandview, Harris-Hanson	816-763-6200
NJ	Hopelawn, Kamco Indl. Sls., Inc.	201-442-6252
NM	Albuquerque, C. T. Carlson & Assocs.	505-836-1448
NY	Victor, Net Sls., Inc.	716-223-1030
NC	Greensboro, Currie, Peak & Frazier, Inc.	919-373-0380
OH	Cleveland, Marlow Assocs.	216-991-6500
OR	Beaverton, Pacific Mktg. Specialists	503-641-9373
TN	Smyrna, Currie, Peak & Frazier	615-459-0743
TX	Dallas, Elcom Mktg.	214-241-2166344390024
WA	Redmond, Pacific Mktg. Specialists	206-882-3144
Can	Oakville, Ont., Haltronics, Ltd.	416-844-2121

Local Distributors

AL	Huntsville, Newark Elctrns.	205-847-9092
AZ	Tempe, Newark Elctrns.	602-968-7441
CA	Anaheim, A to Z Elctrns.	714-632-1620
CA	Foster City, Newark Elctrns.	415-572-8300
CA	Fremont, Allied Elctrns.	415-770-0590
CA	Hawthorne, Kent	213-970-0997
CA	Inglewood, Newark Elctrns.	213-670-0020
CA	Los Angeles, Trebor Elctrns.	213-641-8304
CA	Sacramento, Integrated Elctrns.	916-424-5297
CA	San Jose, Rose Elctrn.	408-943-0200
CA	San Jose, Sierra West Elctrns.	408-435-7477
CA	Sunnyvale, Penstock	408-730-0300
CA	Torrance, Kent Elctrns.	213-320-2700
CO	Arvada, Denver Beta Wintronics	303-431-7161
CO	Denver, Integrated Elctrns.	303-292-6121
CO	Denver, Newark Elctrns.	303-757-5834
CT	Stratford, Utronics, Inc.	203-378-4201
CT	Wallingford, Sager Electrical Supp.	203-265-4600
FL	Clearwater, Allied Elctrns.	813-539-0369
FL	Clearwater, Newark Elctrns.	813-441-3804
FL	Melbourne, Rome Elctrns. South	305-242-8151
FL	Miami, ESL Elctrn. Distr.	305-633-6973
GA	Norcross, Allied Elctrns.	404-446-8595
IL	Chicago, Fed. Screw Prods.	312-478-5744
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Elgin, Allied Elctrns.	312-697-8200
IL	Rosemont, Advent Elctrns.	312-297-6200
IL	Schaumburg, Newark Elctrns.	312-310-8980
IN	Indianapolis, Advent Elctrns.	317-872-4910
IN	Indianapolis, Newark Elctrns.	317-872-7070
IN	Merrillville, Newark Elctrns.	219-738-2787
IA	Cedar Rapids, Advent Elctrns.	800-332-8407
KS	Overland Park, Newark Elctrns.	913-677-0727
MA	Canton, Almo Elctrns.	617-821-1450
MA	Columbia, Allied Elctrns.	301-381-1560
MA	Lynn, Land Elctrn. Supp.	617-592-2220
MI	Farmington Hills, Advent Elect.	313-447-1650
MI	Grand Rapids, Newark Elctrns.	616-455-9190
MI	Livonia, Shand Elctrns.	313-591-3980
MI	Oak Pk., Newark Elctrns.	313-967-0600
MN	Minneapolis, Newark Elctrns.	612-331-6350
MO	St. Louis, Newark Elctrns.	314-421-5066
NE	Omaha, Newark Elctrns.	402-392-1221
NH	Nashua, Newark Elctrns.	603-883-9110
NJ	Bordentown, Newark Elctrns.	609-298-4450
NJ	Cranford, Garden State Elect.	201-272-6400
NM	Albuquerque, Newark Elctrns.	505-883-6181
NY	Buffalo, Genessee Radio & Parts Co., Inc.	716-873-9661
NY	E. Syracuse, ADD Elctrns.	315-437-0200
NY	Farmingdale, Midway Indl. Elctrns.	516-293-6800
NY	Rochester, Allied Elctrns.	717-244-9440
NY	Rochester, Simcona	716-328-3230
NY	Rome, Rome Elctrns.	315-337-5400
NY	Syracuse, Newark Elctrns.	315-437-6611
NC	Greensboro, Newark Elctrns.	919-292-7240
NC	Raleigh, Allied Elctrns.	919-876-5845
OH	Cincinnati, Newark Elctrns.	513-771-9700
OH	Cleveland, Newark Elctrns.	216-391-9330
OH	Dayton, Stotts-Friedman	513-298-5555
OH	Warren, REM Elect.	216-373-1300
OR	Beaverton, Almac Elctrns. Grp.	503-641-9070
OR	Portland, Newark Elctrns.	503-257-0741
OR	Portland, Radar Elec. Co., Inc.	503-232-3404
PA	Drexel Hill, Kass Elect.	215-449-2300
PA	Philadelphia, Almo Elctrns.	215-698-4000
PA	Pittsburgh, Newark Elctrns.	412-367-2790
SC	Greenville, Newark Elctrns.	803-288-9610
TN	Knoxville, New Elctrns.	615-588-6496
TX	Fort Worth, Allied Elctrns.	817-336-5401
TX	Garland, Newark Elctrns.	214-487-8144
TX	Houston, Newark Elctrns.	713-783-1629
TX	Irving, Newark Elctrns.	214-258-1355
UT	Salt Lake City, Standard Supp. Co.	801-486-3371
UT	West Valley City, Salt Lake Beta Wintronic	801-483-1882
VA	Richmond, Newark Elctrns.	804-282-5671
WA	Bellevue, Almac Elctrns. Corp.	206-643-9992
WA	Richland, Radar Elec.	509-943-8336
WA	Seattle, Allied Elctrns.	206-547-2827
WI	Mequon, Lakeview Elctrns. Corp.	414-377-8250
Can	Oakville, Ont., PATtronics, Ltd.	416-844-2121
Can	Rexdale, Ont., Newark Elctrns.	416-675-1130

ANDEEN-HAGERLING, INC., 31899 Miles Road, Chagrin Falls, OH 44022, Tel: 216-349-0370, TELEX: 4931432; Empl.: 14; *Sls. Mgr.:* Eric Whitman

ANDERS, INC., 77 Wolcott Rd., Simsbury, CT 06070, Tel: 203-658-7666, FAX: 203-651-5597; FSC No.: 52045; Empl.: 18; *Sls. Mgr.:* Donald W. Miner

ANDERSEN LABORATORIES, 45 Old Iron Ore Rd., Bloomfield, CT 06002, Tel: 203-286-9090, FAX: 203-242-4472; FSC No.: 03947; Empl.: 130; *Sls. Mgr.:* Richard Johnson ..... **A•1343, 1505, 1685, 1777**

Local Sales Offices & Reps

AZ	Scottsdale, Thorson, Desert States, Inc.	602-998-2444
CA	Encinitas, Andersen Labs.	619-944-9982
CA	San Jose, Bayshore Microwave	408-434-6848
CA	Santa Ana, SSK USA, Inc.	714-250-4073
CO	Aurora, Thorson, Desert States, Inc.	303-671-7344
FL	Indian Harbor, S.E. Comp. Sls.	305-773-3767
GA	Atlanta, S.E. Comp. Sls.	404-451-5353
IL	Northfield, Feller Assocs.	312-446-8065
IA	Cedar Rapids, Feller Assocs.	319-364-0566
MD	Ellicott City, Thiem Assocs.	301-465-4630
MD	Owings Mills, Neal Deoul Assocs.	301-363-4311
MA	Wayland, High Tech Sls.	617-653-3838
NM	Albuquerque, Thorson, Desert States, Inc.	505-293-8555
NY	Melville, Carnes Assocs.	516-694-1600
NY	Rockville Ctr., Milano Bros.	516-764-2200

NY Utica, Upstate Engrg. Sls. 315-797-6721
PA Huntingdon Valley, Rabal Assoc. 215-947-4825
TX Dallas, McDonald Assocs. 214-238-1858
Can St. Laurent, Que., R.F. Microwave 514-335-2335

ANDERSON ELECTRONICS, INC.

FAX: 814-696-0403

ANDERSON ELECTRONICS, P. O. Box 89, Hollidaysburg, PA 16648, Tel: 814-695-4428; Empl.: 60; *Sls. Mgr.:* W. H. Anderson ..... **A•1344**

Local Sales Offices & Reps

CA La Habra, GRU Assocs. 213-691-2993
CA Sunnyvale, Logan Sls 408-732-6020
FL Melbourne, Southern Elctrns. Sls. Co. 305-242-9661
GA Lawrenceville, B. T. Funderburk, Inc. .. 404-963-9495
IL South Elgin, R.K. Elctrn. 312-695-8552
MA Woburn, Microwave Comp. Mktg., Inc. 617-273-3106
MI Southfield, R. C. Nordstrom & Co. 313-559-7373
NY Smithtown, LI., PAF Assocs. 516-360-0940
NC Raleigh, B. T. Funderburk, Inc. 919-782-3493
OH Worthington, Elctrn. Sls. & Technlg. Inc. 614-436-9452
PA Rydal, Espy Sls. 215-576-0780
TX Plano, GW Prods. 214-422-1746
WA Seattle, Harry Levinson Co. 206-382-1300
Can Hamilton, Ont., Cartwright South All Assocs. 416-528-0294

ANDERSON POWER PRODUCTS, Div. of High Voltage Engineering, 145 Newton St., Boston, MA 02135, Tel: 617-787-5880, TELEX: 940453, FAX: 617-254-9217

ANDON ELCTRNS. CORP., 4 Court Dr., Lincoln, RI 02865, Tel: 401-333-0388, FAX: 401-333-0278; FSC No.: OEBT2; Empl.: 55; *Sls. Mgr.:* Irene Small; *Dist. Mgr.:* Irene Small ..... **C•1268-1270**

ANDOVER, INC., 310 North Earl Avenue, Lafayette, IN 47904, Tel: 317-447-1157, FAX: 317-447-1150; Empl.: 120; *Sls. Mgr.:* Harry O. Minns

ANDREW CORP., 10500 W. 153rd St., Orland Pk., IL 60462, Tel: 800-255-1479, TELEX: 25-3897, FAX: 312-349-5943; *Sls. Mgr.:* Carl Van Hecke

ANDREWS BEARINGS, Ina Bearing Company, Inc., New Cut Road, P.O. Box 570, Spartanburg, SC 29304, Tel: 803-583-4541, TWX: 810-282-2578

ANDROTEK/DMI, Box 29098, Columbus, OH 43229, Tel: 614-882-7821, FAX: 614-882-7824; *Sls. Mgr.:* Jim Shirely

ANGHEL LABORATORIES, INC., 3 Route 46 West, Fairfield, NJ 07006, Tel: 201-575-1116, TELEX: 883-193 Anghel UD, FAX: 201-575-9286; FSC No.: 59530; Empl.: 60; *Sls. Mgr.:* Richard Pechfelder

ANGO ELECTRONICS CORP., 16 North Third St., Harrison, NJ 07029, Tel: 201-484-1115, FAX: 201-484-0530; *Sls. Mgr.:* Brian K. Yuen ..... **C•1010**

ANGSTROHM

FAX: 215-296-0697

ANGSTROHM PRECISION, INC., A Sub of Vishay Intertechnology, 63 Lincoln Highway, Malvern, PA 19355, Tel: 215-644-1300, TWX: 510-668-5812; Empl.: 500; *Dist. Mgr.:* Iris Demeritt ..... **A•1874-1875, 2082**

Local Sales Offices & Reps

AL Huntsville, JWL Assocs. 205-883-1712
AZ Phoenix, Howe & Howe 602-264-7971
CA Los Alamitos, Reed Elctrns. 213-598-6676
CA Redwood City, James S. Heaton Co. .. 415-367-9000
CA San Diego, Vishay Res. Sys. Grp. 619-690-5112
CO Englewood, Comps. Sls. Inc. 303-779-8060
CT Wallingford, Comp Rep Assocs. 203-269-1145
FL Altamonte Springs, Semtronic Assocs. 305-831-8233
FL Clearwater, Semtronic Assocs. 813-461-4675
FL Ft. Lauderdale, Semtronic Assocs. 305-731-2484
GA Atlanta, JWL Assocs. 404-320-7643
ID Boise, N.R. Schultz Co. 208-377-8686
IL Rolling Meadows, Eagle Tech. Sls. 312-991-0700
IN Carmel, Shamrock Elctrn. Sls. 317-848-5265
KS Olathe, Technical Sls. Assocs. 913-829-2800
MD Lutherville, J.A. Doughterty Sls. Co. ... 301-321-7890
MA Westwood, Comp Rep Assocs. 617-329-6454
MI Plymouth, Jay Mktg. Assocs. 313-459-1200
MO St. Louis, Technical Sls. Assocs. 314-521-2044
NJ Flanders, K & R Engrg. Sls. Co. 201-584-5235
NM Albuquerque, Nelco Electronix 505-293-1399
NY Rochester, L-Mar Assocs. 716-381-9100
NC Charlotte, JWL Assocs. 704-541-5750
NC Raleigh, JWL Assocs. 919-787-4826
OH Aurora, EMA, Inc. 216-562-6104
OH Centerville, EMA, Inc. 513-433-2800
OR Beaverton, N. R. Schultz Co. 503-643-1644
PA Horsham, TMI 215-441-4300
PA Malvern, Vishay Resistive Sys. Grp. ... 215-644-1300
TX Dallas, Edward F. Aymond Co. 214-826-7620
TX Houston, Vishay Resistive Sys. Grp. .. 713-550-0568
UT Salt Lake City, Harris/CSI 801-974-5155
WA Bellevue, N. R. Schultz Co. 206-454-0300
PR Caguas, Comp. Rep. Assocs. 809-746-6550
Can Concord, Ont., Kaytronics, Inc. 416-669-2262
Can Kawata, Ont., Kaytronics, Inc. 613-564-0080
Can St. Laurent, Que., Kaytronics, Inc. 514-745-5800
Can Surrey, B.C., Kaytronics, Inc. 604-581-5005

Local Distributors

AZ Tempe, Shelley-Ragon, Inc. 602-894-2058
AZ Tempe, TTI, Inc. 602-431-1191
CA Chatsworth, Petell/Passive Comps. Inc. 818-700-8838
CA Chatsworth, Shelley-Ragon, Inc. 818-998-3333
CA Chatsworth, TTI, Inc. 818-709-1010
CA Milipitas, TTI, Inc. 408-946-5577
CA San Diego, Shelley-Ragon, Inc. 619-453-7133
CA San Diego, TTI, Inc. 619-587-4888
CA San Jose, Shelley-Ragon, Inc. 408-432-0600
CA Santa Ana, TT I, Inc. 714-641-9393
CO Denver, TTI, Inc. 303-429-6806
CO Englewood, Shelley-Ragon, Inc. 303-762-0670
CT Wallingford, TT I, Inc. 203-284-7474
FL Orlando, TT I, Inc. 407-859-1000
FL Tampa, Shelley-Ragon, Inc. 813-623-6560
FL Tapa, Impala Elctrns., Inc. 813-885-4747
GA Norcross, TTI, Inc. 404-662-0911
ID Coer d'Alene, A-I Elctrns. 208-765-3280
IL Lombard, Shelley-Ragon, Inc. 312-629-8833
IL Palatine, Ohm Elctrns. 312-359-5500
IA Cedar Rapids, Shelley-Ragon, Inc. 319-373-0525
MD Baltimore, RESCO/Baltimore 301-529-0500
MD Beltsville, RESCO/Washington 301-937-9100
MD Columbia, TT I, Inc. 301-995-1334
MA Wilmington, TT I, Inc. 508-658-4700
MN Eden Prairie, TTI, Inc. 612-944-5080
MN St. Paul, Shelley-Ragon, Inc. 612-642-2828
MO Hazlewood, Shelley-Ragon, Inc. 314-454-0480
MO Independence, Shelley-Ragon, Inc. 816-254-3410
NJ Flanders, VKR Svcs., Inc. 201-584-5393
NJ Mt. Laurel, TTI Inc. 609-234-6400
NY Farmingdale, Command Elctrns. Corp. 516-293-1212
NY Hauppauge, Mast Distrs., Inc. 516-273-4422
NY Medford, Shelley-Ragon, Inc. 516-447-2000
NY Ronkonkoma, TTI, Inc. 516-737-2000
NY Valley Stream, L & S Elctrns. 516-561-2474
OH Cleveland, Specialized Comps. Sls. ... 216-464-0405
OH Dayton, Micro Mil Div. 513-434-8231
OH Worthington, TTI, Inc. 614-848-5770
OR Beaverton, Shelley-Ragon, Inc. 503-641-1691
PA Malvern, Vishay Resistive Sys. Grp. ... 215-644-1300
TX Dallas, Shelley-Ragon, Inc. 214-349-2424
TX Ft. Worth, TT I, Inc. 817-831-8300
TX Ft. Worth, TTI, Inc. 817-595-3100
TX Houston, Texas Comp. Corp. 713-468-3882
WA Redmond, Shelley-Ragon 206-883-2220
WA Redmond, TTI, Inc. 206-882-0291
Can Concord, Ont., Kaytronics 416-669-2262
Can Kawata, Ont., Kaytronics 613-564-0080
Can Quebec, Kaytronics, Inc. 514-745-5800
Can Surrey, B.C., Kaytronics 604-581-5005

ANNULUS TECHNICAL INDUSTRIES, INC., P.O. Box 7407, 1296 Osprey Dr., Ancaster, Ontario, CAN L9G 4G4, Tel: 416-648-8100, FAX: 416-648-8102; Empl.: 16; *Sls. Mgr.:* Don MacAdam

ANORAD CORP., 110 Oser Ave., Hauppauge, NY 11788, Tel: 516-231-1995, TWX: 510-227-9894; Empl.: 280; *Sls. Mgr.:* Sam Singer

ANRITSU, 15 Thornton Rd., Oakland, NJ 07436, Tel: 201-337-1111, 800-255-7234, TELEX: 64-2141 ANRITSUOKLD, FAX: 201-337-1033; Empl.: 75; *Sls. Mgr.:* Mike Riley

Local Sales Offices & Reps

CA San Jose, Anritsu 408-434-6666
FL Melbourne, Anritsu 305-951-7302
GA Norcross, Anritsu 404-662-1541
IN Columbus, Anritsu 812-372-0516
KS Overland Park, Anritsu 913-451-4438
MD Gaithersburg, Anritsu 301-590-0300
MA Nashua, Anritsu 603-888-0230
TX Dallas, Anritsu 214-991-8864

ANRITSU METER CO. OF AMERICA, 795 Franklin Ave., Franklin Lakes, NJ 07417, Tel: 201-848-0033, TELEX: 136011, FAX: 201-848-1845; Empl.: 4

ANRO ELCTRN. INDS. LTD., No. 1-670 Progress Ave., Scarborough, ON, Canada M1H 3A4, Tel: 416-439-6320, FAX: 416-439-7359; Empl.: 135; *Sls. Mgr.:* W. Welk

ANSLEY ELECTRONICS, DIVISION OF THOMAS & BETTS, See T & B/Ansley Corp.

ANSONICS, INC., P.O. Box 910, Halfway, OR 97834, Tel: 503-742-7475; Empl.: 6

ANTEL OPTRONICS INC., 3325B Mainway, Burlington, Ontario, Canada L7M 1A6, Tel: 416-335-5507, TELEX: 061-8489, FAX: 416-335-5141; Empl.: 14; *Sls. Mgr.:* J. D. Brown

ANTENNA RESEARCH ASSOCIATES, 11317 Frederick Ave., Beltsville, MD 20705, Tel: 301-937-8888, TELEX: 374-6620; FSC No.: 23360; Empl.: 30; *Sls. Mgr.:* H.W. Rapalus

ANTENNA SPECIALISTS, The Allen Group, 30500 Bruce Industrial Pkwy., Cleveland, OH 44139, Tel: 216-349-8400, TELEX: 4332133 (AS INTL CLV), FAX: 216-349-8407; Empl.: 1000; *Sls. Mgr.:* Cleve Watkins-OEM; *Dist. Mgr.:* Bob Levy-Distr.

ANTEX DIVISION, 24 Tioga Way, P.O.Box 615, Marblehead, MA 01945, Tel: 617-631-7100, FAX: 617-631-8887; *Sls. Mgr.:* C. Loutrel; *Dist. Mgr.:* C. Loutrel

ANTEX ELECTRONICS CORP., 16100 S. Figueroa St., Gardena, CA 90248, Tel: 213-532-3092, FAX: 213-532-8509; Empl.: 53; *Sls. Mgr.:* Richard Gross; *Dist. Mgr.:* Richard Gross

ANTONA CORP., 1643 1/2 Westwood Blvd., Los Angeles, CA 90024-5603, Tel: 213-473-8995, FAX: 213-473-7112; *Sls. Mgr.:* Katherine Capanna

ANVIL CASES, INC., 4128 Temple City Blvd., Rosemead, CA 91770, Tel: 818-575-8614, 800-242-4466, 800-423-4279(outside CA), TWX: 910-587-4935; FSC No.: FNCM59288; Empl.: 180; *Sls. Mgr.:* Ron Phenicie

A. P. CIRCUIT, 256 Lincoln Ave., Brooklyn, NY 11208, Tel: 718-827-5991, TELEX: 428759, FAX: 718-235-4418 ..... **A•1687-1689**

Local Sales Offices & Reps

MI Southfield, Comtel Instrs. 313-358-2505
NJ Matawan, Reps Five 201-495-2315
OH Cleveland, Comtel Instrs. 216-442-8080
OH Dayton, Comtel Instrs. 513-298-7573

APEC FIBER OPTICS CORP., 1702-D Ponderosa, College Station, TX 77840, Tel: 409-693-5397, FAX: 409-693-1205; Empl.: 15; *Sls. Mgr.:* Mary Lynn Johnson; *Dist. Mgr.:* Mary Lynn Johnson

APEX® μtech

FAX: 602-888-3329

APEX MICROTECHNOLOGY CORP., 5980 N. Shannon Rd., Tucson, AZ 85741, Tel: 602-742-8600, TELEX: 170631; FSC No.: 60024; Empl.: 100; *Sls. Mgr.:* Lynne Shumaker; *Dist. Mgr.:* Bridget Riceci-Byrne ..... **D•1005**

Local Sales Offices & Reps

AL Huntsville, Currie, Peak & Frazier, Inc. 205-536-1506
CA Laguna Hills, Conprod 714-361-0765,
CA Los Altos, Kolm Mktg. 415-948-2635
CA Los Altos, KOLM Mktg. 415-948-2635
CT Guilford, Data Mark Inc. 203-453-0575
MD Elicott City, Nelson Elctrns. 301-747-7887

FL Orlando, Currie, Peak & Frazier, Inc. 407-855-0843
GA Duluth, Currie, Peak & Frazier, Inc. 404-497-9404
IL Buffalo, Torkelson Assocs. 312-520-0710,
IN Ft. Wayne, TX Sls. 219-489-4447
IA Cedar Rapids, Torkelson Assocs. 319-373-0200,
MD Ellicot City, Nelson Elctrns. 301-747-7887
MD Ellicott City, Nelson Elctrns. 301-747-7887
MN Minneapolis, Torkelson Assocs. 612-835-2414,
MA Woburn, Signal Sls. Engrg. 617-938-7872,
NJ Flanders, K & R Engrg. Sls. 201-584-5235,
NY Fairport, bbd Elctrns. 716-425-4101
NC Greensboro, Currie, Peak & Frazier Inc. 919-373-0380
IN Fort Wayne, TX Sales 219-489-4447
TX Dallas, Repmasters 214-247-6236
TX Sherman, Repmaster 214-247-6236
WI Waukesha, Torkelson Assocs. 414-784-7736,

Local Distributors

Can Mississauga, Ont., bbd Elctrns. 416-821-7800,

APM-HEXSEAL, 44 Honeck St, Englewood, NJ 07631, Tel: 201-569-5700, TELEX: 13-3403; FSC No.: 97539; Empl.: 34; *Sls. Mgr.:* Charles Lentini; *Dist. Mgr.:* Charles Lentini

APOLLO LASERS, INC., 20415 Nordhoff St, Chatsworth, CA 91311, Tel: 818-407-3000, TELEX: 66-2278, FAX: 818-882-5900; Empl.: 40; *Sls. Mgr.:* Dexter W. Gocha; *Dist. Mgr.:* Ralph Page

APOLLO MAGNETICS CORP., 2720 W. Beverly Blvd., Los Angeles, CA 90057, Tel: 213-381-2500, TWX: 910-321-4348, FAX: 213-384-4067; Empl.: 420; *Sls. Mgr.:* Charles Williams .... **D•1079**

APPLETON PAPERS INC., P.O. Box 359, Appleton, WI 54912, Tel: 414-734-9841, TELEX: 262752; Empl.: 3,500; *Sls. Mgr.:* Ken Nissen; *Dist. Mgr.:* John Conley

APPLIED CONTROLS CO., INC., 1275 Bloomfield Ave., Fairfield, NJ 07006-2828, Tel: 201-227-5454; FSC No.: 4A725; Empl.: 20; *Sls. Mgr.:* W. Merel

APPLIED DATA COMMUNICATIONS, 14272 Chambers Rd., Tustin, CA 92680, Tel: 714-731-9000, TELEX: 183823 ADC, FAX: 714-838-7172; Empl.: 50; *Sls. Mgr.:* Ben Smith

APPLIED DATA SYSTEMS, 409A East Preston St., Baltimore, MD 21202, Tel: 800-541-2003, 301-576-0335, FAX: 301-576-0338; Empl.: 6 .... **B•1050**

APPLIED ELECTRO TECHNLG., INTL., See STI-Control Components Div.

APPLIED ENGINEERING PRODUCTS, P.O. Box A-D, Amity Sta., New Haven, CT 06525, Tel: 203-387-5282, TWX: 710-465-1173, FAX: 203-387-7832; FSC No.: 19505; Empl.: 85; *Sls. Mgr.:* C. Goff; *Dist. Mgr.:* C. Goff

APPLIED INFORMATION SYSTEMS, INC., 500 Eastowne Dr., Suite 207, Chapel Hill, NC 27514, Tel: 919-942-7801, 800-334-5510, TELEX: 701365, FAX: 919-493-7563; *Sls. Mgr.:* Deborah U. Hopper

APPLIED MAGNETICS, 75 Robin Hill Rd., Goleta, CA 93117, Tel: 805-683-5353, TWX: 910-334-1195, FAX: 805-967-8227; FSC No.: 11935; Empl.: 9000; *Sls. Mgr.:* O. M. Fundingsland

APPLIED MICRO CIRCUITS CORP., 6195 Lusk Blvd., San Diego, CA 92121, Tel: 619-450-9333, TWX: 910-337-1136; FSC No.: 367 4112; Empl.: 235; *Sls. Mgr.:* Greg Barnhart

APPLIED MICROSYSTEMS CORP., 5020 148th Ave., N.E., P.O. Box 97002, Redmond, WA 98073-9702, Tel: 206-882-2000, 800-426-3925, TELEX: 185196APMCRO UT, FAX: 206-883-3049; Empl.: 200; *Sls. Mgr.:* Joe Gomula

APPLIED MICROWAVE DIV. EPSCO, See Epsco Microwave

APPLIED PLASTICS TECHNOLOGY, 45 Broadcommon Rd., Bristol, RI 02809, Tel: 401-253-0200; FSC No.: 9330; Empl.: 30; *Sls. Mgr.:* John A. MacIntyre Jr.

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FAX: 201-385-0702

APPLIED POWER CONVERSION, Technology Dynamics, Inc., 100 School St., Bergenfield, NJ 07621, Tel: 201-385-0500; Empl.: 50 .... **D•1620-1629**

Local Sales Offices & Reps

CA Lennox, Dae Joon Elctrns. 213-674-0219
CT Branford, Abbott-Allison Co., Inc. 203-481-0405
MD Hagerstown, Stinson Assocs., Inc. 301-790-1193
NY Rochester, A.J. Electro Mktg. 716-426-3598
VA Reston, Stinson Assocs., Inc. 703-620-0088

APPLIED SOFTWARE TECH., INC., 1908 Cliff Valley Way, N.E., Atlanta, GA 30329, Tel: 404-663-8660; Empl.: 29; *Sls. Mgr.:* Jim A. Moss

APSCO, INC., 5976 Heisley Road, Mentor, OH 44060, Tel: 216-352-8961, TELEX: 284580, FAX: 216-354-7306; Empl.: 200; *Sls. Mgr.:* Robert G. Borgia

APTEK TECHNOLOGIES, INC., Aptek Microsystems, 700 N. W. 12th Ave., Deerfield Beach, FL 33442, Tel: 305-421-8450, TELEX: 441020, FAX: 305-421-8044; FSC No.: 36741; Empl.: 150; *Sls. Mgr.:* Dwain L. Jenkins, Exec. VP & GM

A.P.W. CO., INC., 72 W. Main, Rockaway, NJ 07866, Tel: 201-627-0643, FAX: 201-627-6396; Empl.: 16

apx ARSTAN PRODUCTS

FAX: 516-333-8911

APX-ARSTAN PRODUCTS INTERNATIONAL INC., 99 Jericho Tpke., Jericho, NY 11753, Tel: 516-333-8100, TELEX: 4973964 (ARSTAN is answer back); Empl.: 300; *Sls. Mgr.:* Stan Shapiro .... **A•2244-2247; D•1618-1619**

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OH Shaker Hgts., KW Elctrn. Sls. Inc. 216-491-9177
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TX Houston, John Dunkel 713-729-1670
WA Redmond, Elctrn. Mktg. Grp. 206-882-0962
WA Vancouver, Elctrn. Mktg. Grp. 503-684-5935

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NC Raleigh, Century Elctrns. 919-872-2203
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AQUALARM, Marine Safety Systems, Inc., 1151 D. Bay Blvd., Chula Vista, CA 92011, Tel: 619-575-4011, FAX: 619-423-4962; FSC No.: 2V373; Empl.: 8; *Sls. Mgr.:* John L. Hooper

ARCO ELECTRONICS, 9822 Independence Ave., Chatsworth, CA 91311, Tel: 818-882-8707, FAX: 818-882-6513; FSC No.: 84171; Empl.: 10; *Sls. Mgr.:* Randy Ryan

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FAX: 818-700-9541

ARCOLECTRIC CORP., 9001 Canoga Ave., Canoga Park, CA 91304, Tel: 818-700-1933; Empl.: 20; *Sls. Mgr.:* Carrie Donze; *Dist. Mgr.:* Carrie Donze .... **B•1130-1131, 1682-1683**

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NJ Denville, Lashen Elctrns. 201-627-3783,
OR Eugene, Larsco 503-484-7491

ARC SYSTEMS, INC., 2090 Joshuas Path, Hauppauge, NY 11788, Tel: 516-582-8020, TELEX: 230199 SWIFT UR ARC, FAX: 516-582-8038; FSC No.: 67245; *Sls. Mgr.:* Robert Miller

AREMCO PRODUCTS, INC., Box 429, Ossining, NY 10562, Tel: 914-762-0685, TELEX: 13-7442, FAX: 914-762-1663; Empl.: 30; *Sls. Mgr.:* Brian Miles

A.R.F. PRODS., 2559 75th St, Boulder, CO 80301, Tel: 303-443-4844, FAX: 303-443-4846; Empl.: 10; *Sls. Mgr.:* Tersh Clark

ARGA CONTROLS, 35 E. Glenarm St., Pasadena, CA 91105, Tel: 213-682-3314, FAX: 818-799-9407; FSC No.: 50290; Empl.: 20; *Sls. Mgr.:* Linda Galman

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ARGO ELECTRONICS, INC., 5054 Bleecker St., Baldwin Park, CA 91706, Tel: 818-962-8422, FAX: 818-960-7312; Empl.: 12

ARGOS PRODS., 600 S. Sycamore St., Genoa, IL 60135, Tel: 815-784-5118; Empl.: 50; *Sls. Mgr.:* Ron Evers

ARGO TRANSDATA CORP., 1 Heritage Pk., Clinton, CT 06413-0554, Tel: 203-669-2233, FAX: 203-669-4316; Empl.: 15

ARIES ELECTRONICS, INC.

FAX: 201-996-3891

ARIES ELECTRONICS, Box 130, Frenchtown, NJ 08825, Tel: 201-996-6841, TWX: 510-235-3391; FSC No.: 51167; Empl.: 160; *Sls. Mgr.:* Frank Folmsbee ... **C•1272-1277**

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FL Tampa, APM Assocs. 813-886-2457
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NC Raleigh, Glen White Assocs. 919-848-1931
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WA Greenacres, Doran Sls. Assocs. 609-922-2317
WA Redmond, Doran Sls. Assocs. 206-885-1885

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IL Mt. Prospect, Magnuson Elctrns. 312-956-0700
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MA Middleboro, Glynn Elctrns. 508-947-4262
MA Needham, Cronin Elctrns. 617-449-5000
NY Rochester, Simcona Elctrns. 716-328-3230
NC Cary, Powell Elctrns. 919-467-1212
OH Akron, Stotts-Friedman 216-253-7000
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PA Bristol, AIM Elect. 215-785-3500
TX Richardson, Altair Co. 214-231-5166
Can Montreal, Que., Tech-Rep 514-337-6046
Can Richmond, Deskin Sls. 604-273-4983

ARISTO GRID LAMP PRODS., 35 Lumber Road, Roslyn, NY 11576, Tel: 516-484-6141, FAX: 516-484-6992; Empl.: 21

ARIUM CORPORATION, 1931 Wright Circle, Anaheim, CA 92806-6052, Tel: 714-978-9531, TELEX: 754903 ARIUM UD, FAX: 714-978-3341; Empl.: 40; *Sls. Mgr.:* Dave Blakemore

ARKAY ENGRAVERS, INC., 10-3 Drew Court, Ronkonkoma, NY 11779, Tel: 516-467-7795, FAX: 516-467-8310; FSC No.: 6Z099; *Sls. Mgr.:* Kenneth Kaplan

ARK ELCTRNS. CORP., 1325 Industrial Hwy., Southampton, PA 18966, Tel: 215-322-6510, FAX: 215-322-4231; Empl.: 20

ARK-LES, 51 Water St, Watertown, MA 02172, Tel: 617-924-2330, TELEX: 24-4659; Empl.: 700; *Sls. Mgr.:* Ted Devnew

ARK-LES SPECIAL PRODUCTS CORP., P.O.BOX 14466, Raleigh, NC 27620, Tel: 919-828-6201, FAX: 919-833-1089; Empl.: 350

ARMBAR INDUSTRIES INCORPORATED

FAX: 201-679-3222

ARMBAR INDUSTRIES, INC., 139 White Oak Lane, Old Bridge, NJ 08857, Tel: 201-679-3377; Empl.: 11; *Sls. Mgr.:* Stephen Gregg ..... **A•1012**

Local Sales Offices & Reps

MD Potomac, C.E. Tech. Elctrns. 301-235-1942
MA Lowell, Underwood Sls. 617-256-8191

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(213) 452-8002
1220 Olympic Bl., Santa Monica, CA 90404

MO Grandview, R. R. Burton Assocs. 816-763-5385
NJ Brielle, EMC Technlgsts. 201-223-6699
NY Medford, EMC Technlgsts. 516-286-5522

ARMEL ELECTRONICS, 1601 75th St., N. Bergen, NJ 07047, Tel: 201-869-4201, TWX: 710-992-8842, FAX: 201-869-4304; FSC No.: 91663; Empl.: 55; *Sls. Mgr.:* V. A. Pasqualino

ARMSTRONG WORLD INDS., W. Liberty St., Lancaster, PA 17604, Tel: 717-397-0611, TWX: 717-560-4405; Empl.: 24,000

ARNOLD ENGINEERING COMPANY, Sub. SPS Technologies, 300 West Street, Marengo, IL 60152, Tel: 815-568-2000, TELEX: 25-7448, TWX: 910-642-2790; Empl.: 650; *Sls. Mgr.:* E. F. Migely, V.P. Mktg./Sls.

ARNOLD MAGNETICS

FAX: 805-484-4113

ARNOLD MAGNETICS, 4000 Via Pescador, Camarillo, CA 93010, Tel: 805-484-4221, TWX: 910-343-6468; FSC No.: 04879; Empl.: 130; *Sls. Mgr.:* Jerry Satuloff ..... **D•1630-1635**

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CA Los Angeles, Arnold Magnetics Corp. 805-484-4221
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FL Melbourne, Teqspec 407-783-3444
GA Atlanta, Teqspec 404-972-7955
IL Chicago, Arnold Magnetics 800-421-8181
MD Silver Springs, Youth Assocs. 301-598-5740
MA Wayland, High-Tech 508-653-3838
MN Minneapolis, Arnold Magnetics Corp. .. 800-421-8181
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NY Buffalo, Arnold Magnetics 800-421-8181
NY New Rochelle, Ascor Elctrns. 914-235-8838
OH Cleveland, Arnold Magnetics 800-421-8181
OH Dayton, Arnold Magnetics 800-421-8181
OK Tulsa, Kruvand Assoc. 214-437-3355
OR Portland, Arnold Magnetics Corp. 800-421-8181
PA Philadelphia, Arnold Magnetics 800-421-8181
TX Dallas, Kruvand Assoc. 214-437-3355
TX Houston, Kruvand Assoc. 713-956-6741
WA Seattle, Arnold Magnetics Corp. 800-421-8181
WI Milwaukee, Arnold Magnetics 800-421-8181
Can Montreal, Que., Arnold Magnetics Corp. 800-421-8181

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AROMAT CORP., 629 Central Avenue, New Providence, NJ 07974, Tel: 201-464-3550, TWX: 710-997-9536; Empl.: 150 ..... **B•1432-1441**

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AZ Tempe, Sys. Sls. of Arizona, Inc. 602-829-9338
AR Little Rock, Beacon Elctrns. Assoc. 501-224-5449
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CA Garden Grove, Elsco 213-533-1255
CA San Jose, Aromat Corp. 408-433-3380
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CT Norwalk, Northeast Reps. 203-866-6030
FL Maitland, EIR, Inc. 305-660-9600
FL Orlando, Aromat Corp. 305-855-1075
GA Atlanta, Beacon Elctrns. Assoc. 404-256-9640
IL Elk Grove Village, Aromat Corp. 312-593-8535
IL Elk Grove Village, Carlson Elctrn. Sls. 312-956-8240
IN Indianapolis, J & W Sls. Co. 317-842-3740
IA Cedar Rapids, Carlson Elctrn. Sls. 319-377-6341
IA Davenport, Rush & West Assocs. 319-388-9494
KS Olathe, Rush & West Assocs. 913-764-2700
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MI Grand Rapids, R. P. Urban & Assocs. 616-245-0511
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MN S. St. Paul, Northport Engrg. 612-457-8000
MO St. Louis, Rush & West Assocs. 314-965-3322
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NC Raleigh, Beacon Elctrns. Assoc. 919-787-0330
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TX Houston, Component Technlg. 713-961-1262
TX Richardson, Aromat Corp. 214-235-0415
UT Salt Lake City, Omega, Ltd. 801-277-8061
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WA Vancouver, Sls. & Engrg. 206-573-5161
WI Milwaukee, Carlson Elctrn. Sls. 414-476-2790
Can Burnaby, B.C., Tech-Trek Ltd. 604-439-1373
Can Mississauga, Ont., Aromat Canada, Inc. 416-624-3777
Can Mississauga, Ont., Tech-Trek Ltd. 416-238-0366
Can St. Laurent, Que., Tech-Trek Ltd. 519-337-7540
Can Vancouver, B.C., Deskin Sls. Corp. 604-324-8343

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AZ Tempe, Bell Inds. 602-966-7800
AZ Tempe, J. C. Intl. 602-968-0893
AR Little Rock, Newark Elctrns. 501-225-8130
CA Chatsworth, Mil-Com Dist. 213-998-3111
CA Garden Grove, Bell Inds. 714-220-0681
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Can	Concord, Ont., Trade Elctrns.	416-661-7111
Can	Edmonton, Alberta, Deskin Sls. Corp.	403-466-2106
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IL	Addison, Hedge Assocs.	312-543-0888
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NJ	Clifton, R.O.I. Sls.	201-340-1515
NY	Rochester, Electra Sls. Corp.	716-427-7860
NY	Syracuse, Electra Sls.	315-463-1248
OH	Cincinnati, G.R. Felz	513-772-5700
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CA	Tustin, Western Switches & Control	714-731-4333
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IL	Chicago, Newark Elctrns.	312-784-5100
IL	Chicago, Revere Elec. Supp.	312-738-3636
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IL	Rockford, G. C. Elctrns.	815-968-9661
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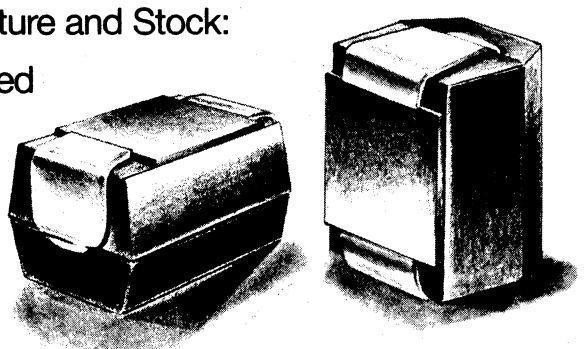

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ASTRO-GEO-MARINE, INC., 202 E. Cota St, Santa Barbara, CA 93101, Tel: 805-965-7005; FSC No.: 51473; Empl.: 15

ASTRO INSTRUMENT CORP., 2501 NW 17th Ln, Pompano Beach, FL 33064, Tel: 305-973-8900, TWX: 510-956-9601, FAX: 305-975-9924; FSC No.: 51761; *Sls. Mgr.:* Peter J. Sinatra, Jr.

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ASTRON CORP., 9 Autry, Irvine, CA 92718, Tel: 714-458-7277, FAX: 714-458-0826; *Sls. Mgr.:* William Pochirowski; *Dist. Mgr.:* William Pochirowski

ASTROSYSTEMS, 6 Nevada Dr., Lake Success, NY 11042, Tel: 516-328-1600, TWX: 510-223-0411, FAX: 516-328-1658; Empl.: Mark DeLauro; *Sls. Mgr.:* Howard Lazarus

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CA	Thousand Oaks, Buchanan Crimp Tool Prods.	805-492-8395
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IL	Schaumburg, Phoenix Co.	312-980-7060
MD	Towson, Kraft Elctrn. Sls.	301-828-5838
NJ	Nutley, Astro Tool Sls.	201-661-1299
UT	Salt Lake City, Nelligan Co.	801-261-1121

Local Distributors

FL	Zephyrhills, Tool-Tronics Hydrospace, Inc.	813-782-7177
IL	Chicago, Elctrn. Connectors Corp.	312-767-2200
PA	Philadelphia, Powell Elctrns.	215-365-1900
PA	Philadelphia, Powell Elctrns., Inc.	215-365-1900
TX	Ft. Worth, Connector Micro-Tooling Sys.	817-283-4883
WA	Auburn, West-Air International, Inc.	206-939-2322
WA	Seattle, Radar Elec. Co., Inc.	206-282-2511

ASTRO-VALCOUR INC., Buhrmann-Tetterode, 100 Thomas Road North, Hawthorne, NJ 07507, Tel: 201-423-3000, TELEX: 130545, FAX: 1-201-423-1987; Empl.: 500; *Sls. Mgr.:* Dennis Tillis

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AZ	Phoenix	602-244-1100
CA	Cypress	714-220-6223
CA	Sunnyvale	408-522-5555
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CO	Englewood	303-850-2935
FL	Orlando	305-345-7296
GA	Norcross	404-446-4712
IL	Itasca	312-250-9777
MA	Framingham	508-626-2161
MN	Bloomington	612-885-4304
NJ	Berkeley Hgts.	201-771-2601
NC	Raleigh	919-790-9001
OR	Portland	503-244-3883
PA	King of Prussia	215-768-2626
TX	Irving	214-869-2040

Local Distributors

AL	Huntsville, Schweber	205-895-0480
AZ	Phoenix, Schweber	602-997-4874
CA	Irvine, Schweber	714-863-0200
CA	Sacramento, Schweber	916-929-9732
CA	San Diego, Schweber	619-450-0454
CT	Danbury, Schweber	203-748-7080
FL	Pompano Bch., Schweber	305-977-7511
GA	Norcross, Schweber	404-449-9170
IL	Elk Grove Vl, Schweber	312-364-3750
IA	Cedar Rapids, Schweber	319-373-1417
KS	Kansas City, Schweber	913-492-2922
MD	Baltiomore, Schweber	301-792-4025
MA	Bedsford, Schweber	617-275-5100
MO	St. Louis, Schweber	314-739-0526
NH	Manchester, Schweber	603-625-2250
NJ	Fairfield, Schweber	201-227-7880
NY	Rochester, Schweber	716-424-2222
NY	Westbury, Schweber	516-334-7474
OH	Dayton, Schweber	513-439-1800
OK	Tulsa, Schweber	918-622-8000
PA	Pittsburgh, Schweber	412-782-1600
TX	Houston, Schweber	713-784-3600

ATC POWER SYSTEMS, INC., 472 Amherst Street, Nashua, NH 03063, Tel: 603-882-1366, TELEX: 756779, FAX: 603-882-2994; FSC No.: 61814; Empl.: 35; *Sls. Mgr.:* Ken Corsetti, Mktg. Mgr.

ATEC, INC., 8219 Kempwood Dr., Houston, TX 77055, Tel: 713-468-7971, TELEX: 77-4132 FLEKS HOU; FSC No.: 09552; Empl.: 40; *Sls. Mgr.:* F. Sawberger

ATHENA CONTROLS, INC., 5145 Campus Dr., Whitemarsh Ind. Campus, Plymouth Meeting, PA 19462, Tel: 215-828-2490, TELEX: 50-3309; Empl.: 70; *Sls. Mgr.:* David A. Tryon; *Dist. Mgr.:* Douglas Crowell, Prod. Mgr.

ATI (AHAM TOR INC.), 999 Company, P.O. Box 9019, Temecula, CA 92390-0739, Tel: 714-676-4151, FAX: 714-676-3031

ATKINS TECHNICAL INC., 3401 S.W. 40th Blvd, Gainesville, FL 32608, Tel: 904-378-5555, TELEX: 51-4736-HALA, FAX: 904-335-6736; Empl.: 30; *Sls. Mgr.:* Robert M. Atkins; *Dist. Mgr.:* Liddon Dell

ATLANTIC MAGNETICS, INC., 1441 S.W. 30th Ave., Pompano Beach, FL 33069, Tel: 305-979-7920; Empl.: 37; *Sls. Mgr.:* Edward Cammarata; *Dist. Mgr.:* Scott Thompson

ATLANTIC OPTICAL MOULDING, Ellis St, P.O. Box 309, Webster, MA 01570, Tel: 617-943-1746; Empl.: 6

ATLANTIC SCIENTIFIC CORPORATION, 2711 S. Harbour City Blvd, Melbourne, FL 32901, Tel: 1-800-544-4737, FAX: 407-727-0736; Empl.: 100; *Sls. Mgr.:* James R. How

ATLANTIC SOLAR PRODUCTS, P.O. Box 70060, Baltimore, MD 21237, Tel: 301-686-2500, 800-237-6527, TELEX: 87-545-ALB ENG PO BAL, FAX: 301-686-6221; Empl.: 14; *Sls. Mgr.:* Doug Keller; *Dist. Mgr.:* Bruce Wilson

ATLAS ENERGY SYSTEMS, Charles E. Smith Co., Inc., 16872 Milliken Ave., P.O. Box 19129, Irvine, CA 92713, Tel: 714-863-0900, FAX: 714-553-8191; Empl.: 30; *Sls. Mgr.:* Jim Logudice ..... D•2174

ATLAS ENGINEERING CORP., 10 Cheney St, Dorchester, MA 02121, Tel: 617-445-7100, FAX: 617-445-4942; FSC No.: 07001; Empl.: 75; *Sls. Mgr.:* Norman Scotch

ATLAS/SOUNDOLIER, 1859 Intertech Dr., Fenton, MO 63026, Tel: 314-349-3110, TWX: 910-760-1650, FAX: 314-349-1251; Empl.: 600; *Sls. Mgr.:* Tom Erickson; *Dist. Mgr.:* Cindy Schubert, Indl. Sls. Spec.

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ATLEE INC., 10 Bayfield Dr., North Andover, MA 01845, Tel: 508-681-1003, TELEX: 928252; FSC No.: 99378; Empl.: 40; *Sls. Mgr.:* John J. Casey; *Dist. Mgr.:* John J. Casey ..... B•1354; C•1704-1705, 1732

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AL	Huntsville, Arthur Harris & Assocs.	205-532-7096
CA	Irvine, The Hapco Grp.	714-474-8474
CO	Littleton, Mercier & Assocs.	303-770-0666
FL	Casselberry, T-Squared Mktg.	407-699-9992
MA	Sharon, Cummings Assocs.	617-784-5600
NY	Binghamton, Empire Tech. Sls.	607-772-0651
NY	Skaneateles, Empire Tech. Assocs.	315-685-5703
NC	Charlotte, Cartwright & Bean	704-536-0303
NC	Greensboro, Arthur Harris Assocs.	919-674-9849
NC	Raleigh, Cartwright & Bean	919-876-4130
OH	Mansfield, R. J. Goosman & Assocs.	419-756-5746
PA	Paoli, Stitzer Assocs.	215-644-5500
TN	Knoxville, Cartwright & Bean	615-693-7450
TN	Memphis, Cartwright & Bean	901-362-8345
TX	Arlington, Rem-Air Corp.	214-234-1069
WA	Seattle, Horton & Assocs.	206-322-1500

Local Distributors

AZ	Phoenix, EGR	602-840-0320
CA	Anaheim, Bisco Inds.	714-635-0380
CA	San Jose, Bisco Inds.	408-946-8980
IL	Franklin Pk., Bisco Inds.	312-451-1230
IN	Ft. Wayne, Graham Elec. Supp.	219-423-3422
IN	Indianapolis, Graham Elec. Supp.	317-634-8202
IA	Cedar Rapids, Deeco	319-365-7551
MA	Marlboro, Hardware Specialties	617-481-8622
MA	Winchester, Rush Inds.	617-729-5800
MA	Woburn, Bisco Inds.	617-938-8590
MN	Minneapolis, Aerospace Computer	612-884-4725
NJ	Nutley, Essex Electric	201-661-2600
NJ	Paramus, N.Y. Fastener	201-265-8770
NY	Bayshore, Merrit Fastener	516-242-1800
NY	Buffalo, Summit Dist.	716-887-2800
NY	Long Island City, Hardware Specialty	212-361-9393
NY	Plainview, Elctrn. Precepts	516-293-7441
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ATV RESEARCH, INC., 1301 Broadway, Dakota City, NE 68731, Tel: 402-987-3771; *Sls. Mgr.:* Mel Shadbolt

AUBURN MFG., Pease Ave. & Stack St., Middletown, CT 06457, Tel: 203-346-6677, FAX: 203-346-1334; Empl.: 45; *Sls. Mgr.:* Gary L. Mittelman, VP

AUDICHRON, 3620 Clearview Parkway, Atlanta, GA 30340-2178, Tel: 404-455-4892, FAX: 404-455-7972; Empl.: 145; *Sls. Mgr.:* Doug Altman; *Dist. Mgr.:* Dave Nichols

AUDIO PRECISION, INC., PO Box 2209, Beaverton, OR 97075, Tel: 503-627-0832, TELEX: 283957 AUDIO UR, FAX: 503-641-8906; Empl.: 18; *Sls. Mgr.:* Thomas Mintner

AUDIOSEARS, South St., Stamford, NY 12167, Tel: 607-652-7305; FSC No.: 97101; Empl.: 120; *Sls. Mgr.:* D. Hartwell

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AUDIOTRONICS CORP., 7428 Bellaire Ave., N. Hollywood, CA 91605, Tel: 818-765-2645, TELEX: 69-1241; Empl.: 70; *Sls. Mgr.:* John Desmond

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AUGAT INC., 33 Perry Ave., Box 779, Attleboro, MA 02703, Tel: 617-222-2202, TWX: 710-391-0644, FAX: 617-226-5257; FSC No.: 91506; Empl.: 2500; *Sls. Mgr.:* Jim Fuchs/Jeff Mahall; *Dist. Mgr.:* William Hall

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AZ Phoenix, Augat Inc. 602-224-6104
AZ Phoenix, Spectrum Mktg. 602-890-9000
CA Montrose, Signal Entprs. 818-957-0640
CA San Jose, Augat Inc. 408-249-8801
CA Solano Bch., Signal Entprs. 619-549-4414
CO Denver, Augat Inc. 303-757-2100
CO Denver, Spectrum Mktg. 303-480-9991
FL Orlando, Augat Inc. 305-352-2020
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IL Downer's Grove, Rockford Controls ... 312-960-2046
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MA Canton, Augat Inc. 617-762-3164
MI Livonia, Luebbe Sls. Co. 313-489-8828
MN St. Paul, Countryman Assocs. 612-645-9151
MS Jackson, Glen White Assocs. 601-856-5411
MO Maryland Hgts., Ensco-Rep, Inc. 314-423-3935
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NY Clarence Ctr., Leonard D. Allen Inc. ... 716-835-1955
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OH Cincinnati, Luebbe Sls. Co. 513-530-0600
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OH Dayton, Augat, Inc. 513-256-6118
OH Dayton, Luebbe Sls. Co. 513-294-0426
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TX Dallas, Augat Inc. 214-781-4211
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AZ Phoenix, Arrow/Kierulff Elex Grp. 602-437-0750
AZ Phoenix, Hall-Mark Elexs. 602-437-1200
AZ Phoenix, Wyle Labs. 602-437-2088
AZ Tempe, Acacia Sls. 602-894-2874
AZ Tempe, Time Elctrns. 602-967-2000
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CA Anaheim, Time Elctrns. 714-937-0911
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CA Milpitas, Zack Elctrns. 415-942-5432
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CA San Diego, Time Elctrns. 619-586-1331
CA San Diego, Wyle Labs., EMG 619-565-9171
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CA San Jose, Hall-Mark Elctrns. 408-432-0900
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GA Atlanta, Time Elctrns. 404-984-0136
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GA Norcross, Hall-Mark Elctrns. 404-447-8000
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IN Indianapolis, Hall-Mark Elctrns. 317-872-8875
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IA Cedar Rapids, Arrow/Kierulff Elex Grp. 319-395-7230
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MN Crystal, Newark Elctrns. 612-535-4280
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MN Edina, Arrow/Kierulff Elex Grp. 612-830-1800
MN Edina, Time Elctrns. 612-835-1250
MN Fridley, Voyager Elctrns. 612-571-7766
MO Independence, Ragon Elctrns. 816-254-3410
MN Minneapolis, Newark Elexs 612-331-6350
MN St. Paul, Newark Elctrns. 612-631-2683
MN St. Paul, Shelley-Ragon 612-642-2828
MO Earth City, Hall-Mark Elexs. 314-291-5350
MO Independence, Shelley-Ragon Elctrns. 816-254-3410
MO Kansas City, Walter's Indl. Elctrns. 816-531-7015
MO Maryland Hgts., Chelsea Inds. 314-997-7709
NJ Mt. Laurel, Wes-Garde Comps. 609-778-8190
MO St. Louis, Arrow/Kierulff Elctrns. 314-567-6888
MO St. Louis, Time Elctrns. 314-391-6444
MO St. Louis, Van Sickle Radio Elec. 314-621-5000
MO St. Louis, Wes-Garde Comps. 314-567-7776
NH Manchester, Arrow/Kierulff Elex Grp. 603-668-6968
NJ Bellmawr, Mid Atlantic Elctrns. 609-931-5303
NJ Camden, GRS Elctrns., Inc. 609-964-8560
NJ Clifton, J-Mar Elexs. Inc. 201-772-6400
NJ E. Brunswick, Almo Elctrns. 201-613-0200
NJ Fairfield, Hall-Mark Elctrns. 201-575-4415
NY Hauppauge, Time Elctrns. 516-273-0100
NJ Kenilworth, Federated Purchaser 201-272-0505
NJ Marlton, Arrow/Kierulff Elex Grp. 609-596-8000
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MN Minneapolis, Merit Elctrns. Corp. 612-546-5383
MN Minnetonka, Hamilton/Avnet Elctrns. 612-932-0600
MN Minnetonka, Pioneer/Twin Cities 612-935-5444
MO Earth City, Hamilton/Avnet Elctrns. ... 314-344-1200
MO St. Charles, Lectronix Inc. 314-946-6424
MO St. Louis, Arrow Elctrns. 314-567-6888
MO St. Louis, Time Elctrns. 314-391-6444
NH Manchester, Arrow Elctrns. 603-668-6968
NH Manchester, Hamilton/Avnet Elctrns. 603-524-9400
NJ Cherry Hill, Hamilton/Avnet Elctrns. ... 609-424-0110
NJ Clifton, J-Mar Elctrns. 201-772-6400
NJ Fairfield, Hamilton/Avnet Elctrns. 201-575-3390
NJ Marlton, Arrow Elctrns. 609-596-8000
NJ Marlton, Milgray/Marlton 609-983-5010
NJ Parsippany, Arrow Elctrns. 201-538-0900
NJ Pine Brook, Pioneer 201-575-3510
NJ Pinebrook, Time Elctrns. 201-882-4611/4616
NM Albuquerque, Arrow Elctrns. 505-243-4566
NM Albuquerque, Hamilton/Avnet Elctrns. 505-765-1500
NM Albuquerque, Sterling Elctrns. 505-345-6601
NY Binghamton, Pioneer 607-722-9300
NY Bohemia, Car-Lac Elctrn. Indl. Sls. 516-567-4200
NY E. Syracuse, Time Elctrn. Sls. 315-432-0355
NY Fairport, Pioneer 716-381-7070
NY Farmingdale, Milgray Elctrns. 516-420-9800
NY Hauppage, Hamilton/Avnet 516-231-9800
NY Hauppage, Time Elctrn. Sls. 516-273-0100
NY Hauppauge, Arrow Elctrns. 516-231-1000
NY Liverpool, Arrow Elctrns. 315-652-1000
NY Melville, Arrow Elctrns. 516-694-6800
NY Rochester, Arrow Elctrns. 716-427-0300
NY Rochester, Hamilton/Avnet Elctrns. ... 716-475-9130
NY Syracuse, Hamilton/Avnet Elctrns. 315-437-2641
NY Woodbury, Pioneer 516-921-8700
NC Charlotte, Pioneer/Carolina 704-527-8188
NC Charlotte, Time Elctrns. 704-522-7600
NC Raleigh, Arrow Elctrns. 919-876-3132
NC Raleigh, Hamilton/Avnet Elctrns. 919-878-0819
OH Centerville, Arrow Elctrns. 513-435-5563
OH Cleveland, Hamilton/Avnet Elctrns. ... 513-433-0610
OH Cleveland, Milgray/Cleveland 216-447-1520
OH Cleveland, Pioneer/Cleveland 216-587-3600
OH Dayton, Hamilton/Avnet Elctrns. 513-433-0610
OH Dayton, Pioneer/Dayton 513-236-9900
OH Solon, Arrow Elctrns. 216-248-3990
OH Westerville, Hamilton/Avnet Elctrns. .. 614-882-7004
OR Hillsboro, Wyle Labs/EMG 503-640-6000
OR Lake Oswego, Hamilton/Avnet Elctrns. 503-635-8831
OR Portland, Time Elctrns. 503-684-3780/5523
206-454-8666,800-547-6523
OR Tigard, Arrow Elctrns. 503-684-1690
PA Horsham, Pioneer/Del. Valley 215-674-4000
PA King of Prussia, Time Elctrns.-Mid Atlantic 215-337-0900
PA Monroeville, Arrow Elctrns. 412-856-7000
PA Pittsburgh, Hamilton/Avnet Esctrns. 412-281-4150
TX Austin, Hamilton/Avnet Elctrns. 512-837-8911
TX Carrolton, Arrow Elctrns. 214-380-6464
TX Carrolton, Time Elctrns. 214-241-7441
TX Dallas, Sterling Elctrns. 214-243-7441
TX El Paso, Ideal Elctrns. 915-779-6647
UT Salt Lake City, Hamilton/Avnet. 801-972-2800
UT Salt Lake City, Wyle Lambs/EMG... 801-974-9953
UT W. Valley, Time Elctrns. 801-975-8181/1631
WA Bellevue, Arrow Elect. 206-643-4800
WA Bellevue, Hamiton/Avnet Elctrns. 206-643-3950
WA Bellevue, Wyle Dist.Grp/Bal. of Washington 800-562-9904
WA Redmond,, Time Elctrns. 206-882-1600
WI Brookfield, Arrow Elctrns. 414-792-0150
WI New Berlin, Hamilton/Avnet Electrns. 414-784-4510

AUGAT, INC., Packaged Products Div., 33 Perry Ave., P. O. Box 659, Attleboro, MA 02703, Tel: 617-222-9635, TELEX: 710-391-0644

AUGAT/PYLON CO., INC., P.O. Box 2510, Attleboro Falls, MA 02763, Tel: 508-699-9800, TELEX: 948095; Empl.: 400; *Sls. Mgr.:* Gillis Mellon

AUGAT/RDI, 525 Randy Rd., Carol Stream, IL 60188, Tel: 312-682-4100, TWX: 910-252-2118, FAX: 312-682-4562; FSC No.: 53337; Empl.: 70; *Sls. Mgr.:* John Deichl, Mktg. Mgr.; *Dist. Mgr.:* John Deichl, Mktg. Mgr. ... C•1288-1289

Local Sales Offices & Reps

AL Huntsville, Alpha 205-533-0766
AZ Phoenix, Augat Sls.-AZ 602-224-6104
CA Los Angeles, Wiley Co. 213-666-1611
CA San Diego, Wiley Co. 619-571-2881
CA San Jose, Augat Sls. 408-249-8801
CO Denver, Spectrum Mktg. 303-480-9991
FL Orlando, Augat Sls. 407-352-2020
GA Tucker, Alpha 404-491-9430
IL Carol Stream, Reed Dvcs. 800-682-7333
IL Downers Grove, Rockford Controls ... 312-960-2046
IN Indianapolis, Luebbe Sls. Co. 317-845-7389
IA Marion, Ensco-Rep., Inc. 319-377-8551
KS Wichita, Ensco-Rep., Inc. 316-683-1070
MA Canton, Augat Sls. 617-762-3164
MI Livonia, Luebbe Sls. Co. 313-489-8828
MN St. Paul, Countryman 612-645-9151
MO Maryland Hts., Ensco-Rep., Inc. 314-423-3935
NC Kernersville, Wallace Elctrn. 919-996-2742
OH Cincinnati, Luebbe Sls. 513-530-0600
OR Beaverton, Augat Sls. 503-645-0644

PA Trevose, P.S.A., Inc. 215-245-0513
SC Kernersville, Wallace Elec. Sls. 919-996-2742
TN Oak Ridge, Alpha Mktg. 615-482-4681
TX Dallas, Augat Sls. 214-788-4211
TX Houston, Augat Sls. 713-781-9343
UT Murray, Butterworth Mktg. 801-268-2244
WA Bellevue, Augat Sls. 206-451-9777
WI Westbend, Rockford Controls 800-323-1042

Local Distributors

CA Anaheim, Control Des. 714-821-1516
CA Gardena, Calif. Switch & Signal 800-225-7924
CA Los Angeles, Master Distr. 213-452-1229
CO Englewood, Indl. Elctrns. 303-694-9444
FL Altamonte Springs, Control Design 305-788-3220
IL Arlington Heights, Lo Dan Elctrns. 312-398-5311
IL Carol Stream, Lectro Comps. 312-690-0520
IL Chicago, Newark Elctrns. 312-784-5100
IN Ft. Wayne, Bell Inds. 219-423-3422
MA Middleboro, Glynn Elec. 617-947-4262
MA Peabody, Time Elec. 617-532-6200
MI Farmington Hills, Advent Elctrns. 313-477-1650
MN Minneapolis, Control Des. 612-721-6555
MO St. Louis, Time Elctrns. 314-391-6444
NJ Oakton, Relay Specialties 201-337-1000
NY Buffalo, Summit 716-887-2800
NY Lynbrook, Peerless Radio 516-593-2121
NY Rochester, R. Baker Elctrns. 716-586-9164
OH Akron, AESCO Elctrn. Inc. 216-762-8818
OH Columbus, E/M Equip. Co. 614-236-0888
OH Columbus, Elctrns. Mktg. Co. 614-299-4167
PA Malvern, Control Des. 215-296-0150
TX Dallas, Control Des. 214-358-1441
WI Green Bay, A-A Elec. 414-499-0258
WI West Allis, Marsh Elctrns. 414-475-6000

FAX: 612-550-4099

AULT, INCORPORATED, 1600 Freeway Blvd., Minneapolis, MN 55430, Tel: 612-560-9300; Empl.: 300; *Sls. Mgr.:* Greg Harris ..... **D•1640-1641**

Local Sales Offices & Reps

AL Huntsville, L & D, Inc. 205-837-1469
CA Los Angeles, A-F Sls. Engrg. Inc. 213-681-5631
CA Orange County, A-F Sls. Engrg. Inc. 714-641-2903
CA San Diego, A-F Sls. Engrg. inc. 619-226-8424
CA Santa Clara, Magna Sls. 408-727-8753
CO Denver, William J. Purdy 303-790-2211
CT Wallingford, Marathon Sls., LTD 617-875-3566
FL Deerfield Bch., Sls. Engrg. Concepts Inc. 305-426-4601
GA Atlanta, L & D, Inc. 404-455-3483
IL Arlington Hgts., MSI 312-956-1000
IA Des Moines, Beams Co. 515-255-1148
KS Shawnee Mission, Beams Co. 913-631-0300
MD Columbia, Delta III Assocs. 301-730-4700
MA Framingham, Marathon Sls., LTD 617-875-3566
MI Plymouth, Jay Mktg. Assocs. 313-459-1200
MN Minneapolis, Cahill, Schmitz & Cahill 612-646-7217
MO St. Louis, Beams Co. 314-434-8448
NJ Ocean, P. Saftler Assocs. 201-922-3014
NY Lynbrook, P. Saftler Assocs. 516-593-7880
NC Greensboro, L & D, Inc. 919-292-3201
OH Cleveland, Lyons Corp. 216-659-9224
OH Dayton, E. Lyons Co. 513-278-0714
OR Portland, Jas. J. Bacher Co. 503-297-8744
PA Philadelphia, All-Tech Mktg. 717-763-4126
TX Austin, R. F. Kimball Co. 512-443-5284
TX Richardson, R. F. Kimball Co. 214-231-3447
WA Seattle, Jas. J. Backer Co. 206-285-1300
Can Toronto, Deskin Sls. 416-475-1412

Local Distributors

CA Cincinnati, Hughes Peters 513-351-2000
CA Long Bch., Power Sys. Distrs. 213-597-6957
CA Milpitas, Power Sys. Distrs. 408-263-1063
CA Mountain View, USI Elctrn. Comps. 415-969-5420
CA San Diego, Tauber Elctrns. 619-274-7242
CA Santa Monica, Distr. Specialists 213-393-9666
CA Van Nuys, Natl. Electro Sls. Corp. 213-781-0505
MA Sharon, Adcour 617-784-8123
MO St. Charles, Finnigan Elctrns. 314-946-6201
UT Salt Lake City, Std. Supp. Co. 801-453-3371
Can St. Laurent, Que., Tech-Rep Elctrns., Ltd. 514-337-6046

AURIC CORP., 470 Frelinghuysen Ave., Newark, NJ 07114, Tel: 201-242-4100, FAX: 201-242-5796; Empl.: 55

AUSTRON, INC., P.O. Box 14766, Austin, TX 78761-4766, Tel: 512-251-2341, TWX: 910-874-1356, FAX: 512-251-9685; FSC No.: 24672; Empl.: 130; *Sls. Mgr.:* Ron Myers ..... **A•1348**

Local Sales Offices & Reps

AL Huntsville, Sci. Devices - SE 205-536-1969
AZ Scottsdale, Territorial Mktg. 602-994-8665
CA Goleta, Thorsen Co. 805-964-8751
CA Mtn. View, N.S. Westronics 415-960-1111
CA Signal Hill, Thorson Co. 213-595-0361
CO Englewood, Sierra Tech. Grp. 303-790-1700
FL Coral Springs, Scientific Dvcs.-S.E. 305-755-4453
FL Orlando, Sci. Devices - SE 305-841-8180
FL Shalimar, Sci. Devices - SE 904-651-4407
GA Snellville, Sci. Devices-SE 404-979-7971
IL Elk Grove, Loren Green Assoc. 312-593-0282
IN Indianapolis, Loren Green Assoc. 317-293-9827
MA Reading, Scheinfein Assocs. 617-944-2304
MI Union Lake, Ashby Assocs. 313-363-1100
MN Minneapolis, Loren Green Assoc. 612-571-6666
NY Frankfort, Kapital Instr. Sls. 315-894-4245
NY Huntington, CDB Entprs. 516-692-5200
NC Winston Salem, Sci. Devices-SE 919-765-5776
OH Dayton, Ashby Assocs. 513-461-2668
OH Lyndhurst, Ashby Assocs. 216-461-0826
OK Park Hill, Scientific Dvcs.-S.W. 918-457-4888
OR Beaverton, Cascade Data Mktg. 503-641-9266
PA N. Wales, Sci. Devices - Phila. 215-699-7707
TX Austin, Scientific Dvcs.-S.W. 512-442-6215
TX Houston, Sci. Devices - Gulfcoast 713-864-1711
TX Richardson, Sci. Devices - SW 214-231-8106
TX San Antonio, Scientific Dvcs.-S.W. 512-736-3164
VA Reston, Austron 703-471-7963
WA Kirkland, Cascade Data Mktg. 206-747-6190

AUTODESK, 2320 Marinship Way, Sausalito, CA 94965, Tel: 415-332-2344, TELEX: 275946, FAX: 415-331-8093; Empl.: 399; *Sls. Mgr.:* Richard Cuneo, Dir. of Sls.; *Dist. Mgr.:* Rex Johnson

AUTOMATED PRODUCTION CONCEPTS, 63 Hillside Terrace, Wayne, NJ 07470, Tel: 201-831-8300, TELEX: 130120, FAX: 201-633-7755; Empl.: 4

AUTOMATED PROD. EQUIP. CORP., 142 Peconic Ave., Medford, NY 11763, Tel: 516-654-1197, TWX: 510-228-2120, FAX: 516-289-4735; FSC No.: 57216; *Sls. Mgr.:* Arthur Ayala

AUTOMATIC COIL CORP., Sub. Designatronics, Inc., 3545 N.W. 71st St., Dept. E, Miami, FL 33147, Tel: 305-696-6660, FAX: 305-696-0626; FSC No.: 03765; Empl.: 245 ..... **A•1198-1201, 1506-1509**

Local Sales Offices & Reps

AL Huntsville, Hughes Assocs. 205-533-9108
CA Huntington Beach, Mil-Com Sls. 714-840-2424
CA Mtn. View, Fetty/Schoenduve 415-962-8330
CA San Diego, Mil-Com Sls. 619-484-3402
CA Thousand Oaks, Mil-Com Sls. 805-647-8569
FL Pensacola, Hughes Assocs. 904-433-1787
GA Norcross, Hughes Assocs. 404-662-1587
IL Downers Grove, Rockford Controls Co. 312-360-2046
MS Corinth, Hughes Assocs. 601-287-2915
NJ Paramus, Design Elctrns. 201-845-6224
NY E. Syracuse, Nycom 315-437-8343
NC Cary, Hughes Assocs. 919-467-7029
OH Medina, Rockford Controls Ohio, Inc. 216-725-3705
PA McKees Rocks, Rockford Controls of Ohio 412-331-0306
TN Jonesboro, Hughes Assocs. 615-753-2719
VA Fairfax, Schibley Assocs., Inc. 703-591-3008

AUTOMATIC SWITCH CO., 50-60 Hanover Road, Florham Park, NJ 07932, Tel: 1-201-966-2000, TELEX: 136422, FAX: 1-201-966-2628; Empl.: 1,200; *Sls. Mgr.:* Wayne Bouchard

AUTOMATIC SYSTEMS DEVELOPERS, P.O. Box 3210, Industry St., Poughkeepsie, NY 12603, Tel: 914-473-5530, FAX: 914-454-2538; Empl.: 650; *Sls. Mgr.:* Stanley Bachman

AUTOMATIC TIMING & CONTROLS CO., 201 So. Gulph Rd., King of Prussia, PA 19406, Tel: 215-337-5500, 800-441-8245, TELEX: 84-6437; Empl.: 300; *Sls. Mgr.:* R. L. Swanson

AUTOMATION DISPLAYS INC., 3533 N. White Ave., Eau Claire, WI 54703, Tel: 715-834-9595, FAX: 715-834-9596; Empl.: 19

AUTOMATION ELCTRNS., R.J.A. Inds., Inc., 9640 Topanga Cyn Pl. Bldg. J, Chatsworth, CA 91311, Tel: 818-998-5124, FAX: 818-998-6654; Empl.: 25; *Sls. Mgr.:* Robert J. Aiani

AUTOMATION PRODS., INC., 3030 Max Roy, Houston, TX 77008, Tel: 713-869-0361, TELEX: 775-959, FAX: 713-869-7332

AUTOMATION UNLIMITED, Icon Corporation, 134 New Boston St., Woburn, MA 01801, Tel: 617-933-7288, FAX: 617-933-2042; *Sls. Mgr.:* Rich Farley; *Dist. Mgr.:* Kevin Bagaline

AUTOMOTION, INC., 683 Airport Blvd., Ann Arbor, MI 48108, Tel: 313-662-7771, FAX: 313-662-3707; Empl.: 20; *Sls. Mgr.:* David E. Drenning ..... **B•1234**

Local Sales Offices & Reps

CA Laguna Hills, South Rep 714-951-1084
CT Seymour, Sturdy Corp. 203-888-1480
IL Chicago, Clarkson Co. 312-286-2314
MA Wellesley Hills, Sturdy Corp. 617-235-2330
MN Little Canada, Assured Sls. 612-482-1309
NH Derry, Sturdy Corp. 603-434-8440
NY Pittsford, Vordex, Inc. 716-586-8119
NC Charlotte, H & A, Inc. 704-598-8599
OH Dayton, Ray Stan Controls 513-962-2604
OR Portland, Controltek, Inc. 503-641-0876
TX Richardson, Control Dynamics 214-644-6945
WA Spokane, Controltek, Inc. 509-922-2971

AUTOROLL MACHINE CORPORATION, 11 River St., Middleton, MA 01949, Tel: 508-777-2160, TELEX: 940250, FAX: 508-777-9453; Empl.: 120

AUTOSPLICE, INC., 59-12, 37th Ave, Woodside, NY 11377, Tel: 718-429-0500, TELEX: 420902, FAX: 718-429-1313; Empl.: 197; *Sls. Mgr.:* O. Nedelkovich

Local Sales Offices & Reps

CA San Diego, Autosplice West 619-530-0077
CA San Jose, Autosplice N.W. 408-224-8673
IL Chicago, Schiffer Assoc. 312-847-2400
IN Fort Wayne, Menze Sls. 219-747-5616
MA Cambridge, Autosplice Northeast 617-494-8430

AUTOSWAGE PRODUCTS, 726 River Rd., Shelton, CT 06484, Tel: 203-929-1401, TELEX: 963-542; Empl.: 170; *Sls. Mgr.:* R. D'Autrechy

Local Sales Offices & Reps

AL Montgomery, M.Y.A., Inc. 205-284-1948
CA Glendale, Haldeman & Frazier 818-957-4554
CT Roxbury, Yankee Engrg. 203-426-5679
IN Greensburg, H. K. Feaster Assocs. 812-663-5689
MO Maryland Heights, Meiners Sls. 314-739-1114
NY Pittsford, Production Mktg. Grp. 716-248-5835
SC Fort Mills, Eagle Sales, Inc. 803-548-2222
TX Arlington, Paine & Murray, Inc. 817-461-6331
WA Bellevue, H.J. Sls. Co. 206-453-1957
Can Candiac, Que., W. H. Elctrns. Registered 514-632-3685

AUTOTROL CORPORATION, P.O. Box 557, Crystal Lake, IL 60014, Tel: 815-459-3080, TELEX: 72-2417, FAX: 815-459-3227; Empl.: 140; *Sls. Mgr.:* Loris Thacker

AUTRONICS CORP., 314 E. Live Oak, Ste. A, Arcadia, CA 91006, Tel: 818-445-5470, TWX: 910-582-3216, FAX: 818-446-0014; FSC No.: 03972; Empl.: 95; *Sls. Mgr.:* Annabelle Cloud, Contracts Mgr.; *Dist. Mgr.:* Gary Noyes

AVA ELECTRONICS CORPORATION, P.O. Box 184, 4000 Bridge St., Drexel Hill, PA 19026, Tel: 215-284-2500, TELEX: 3711411, FAX: 215-259-8379; Empl.: 100; *Sls. Mgr.:* William McKinley; *Dist. Mgr.:* Michael Ward

AVA INSTRUMENTATION, INC., 8010 Highway 9, Ben Lomond, CA 95005, Tel: 408-336-2281, TELEX: 5101007906 AVA, FAX: 403-336-5049; FSC No.: 61933; Empl.: 7; *Sls. Mgr.:* Allan Hughes

AVANTEK, INC., 481 Cottonwood Dr., Milpitas, CA 95035-7492, Tel: 408-432-3080, TWX: 310-371-8717, FAX: 408-954-0633; Empl.: 3200; *Dist. Mgr.:* John Locke

Local Sales Offices & Reps

CA Westlake Vl, Avantek, Inc. 805-373-3870
IL Palatine, Avantek, Inc. 312-358-8963
MD Cloumbia, Avantek, Inc. 301-381-2600

Local Distributors

AL Huntsville, Comp. Dists. Inc. 205-883-7501
AZ Tempe, Sertek, Inc. 602-894-9405
CA Sunnyvale, Penstock, Inc. 408-730-0300
CA Westlake Vl, Sertek, Inc. 818-707-2872
FL Largo, Applied Specialties of FL 813-530-7309
FL Melbourne, Comp. Dists. Inc. 407-724-9910
GA Norcross, Comp. Dists. Inc. 404-441-3320
IL Palatine, Penstock Midwest 317-784-3870
MD Beltsville, Applied Specialists, Inc. 301-792-2211
MA Lexington, Sickles Distbn. Sls. 617-862-5100
NJ Fairfield, Penstock-East 201-808-1414

NC Raleigh, Comp. Dists. Inc. 919-787-7311
TX Dallas, Thorson Distbg. Co. 214-233-5744
WA Bellevue, Penstock, Inc. 206-454-2371
Can Sertek, Inc. 818-707-2872

FAX: 203-354-8597

AVEL-LINDBERG INC., 5 Old Town Park Rd., Unit 47, New Milford, CT 06776, Tel: 203-355-4711; Empl.: 8; *Sls. Mgr.:* Melanie B. Roman ..... **A•2258-2259**

Local Distributors

CT Wallingford, Sager Elctrl. Supp. Co. 203-265-4600
MA Hingham, Sager Elctrl. Supp. Co. 617-749-6700
MA Hingham, Sager Electrical Supp. Co. .. 617-749-6700

AVEX ELECTRONICS, 1683 Winchester Rd., P.O. Box 1026, Bensalem, PA 19020, Tel: 215-638-1515, 800-345-1295, FAX: 215-638-9108; FSC No.: 58414; *Sls. Mgr.:* Mike Battery Batley; *Dist. Mgr.:* Mike Batley .... **D•1454-1456**

Local Sales Offices & Reps

CO Denver, Tessco 303-778-1119
IA Marion, Ensco-Rep 319-377-8550
KS Wichita, Ensco-Rep 316-683-1070
MO Maryland Hgts., Ensco Rep Inc. 314-423-3935
NE Countryside, Ensco Rep 913-384-0840

AVIBANK MANUFACTURING, INC., 210 S. Victory Blvd., Burbank, CA 91503, Tel: 818-843-4330, TWX: 910-498-2215; FSC No.: 84256; Empl.: 465; *Sls. Mgr.:* D. Ladin

FAX: 201-382-4996

AVIONIC INSTRUMENTS, 1414 Randolph Ave., Avenel, NJ 07001, Tel: 201-388-3500, TELEX: 844413; Empl.: 160; *Sls. Mgr.:* Bryce Wiedeman; *Dist. Mgr.:* Mike Barnaba ..... **D•1642-1644, 2166-2173**

AVTECH

FAX: 613-226-2802

AVTECH ELECTROSYSTEMS LTD., P.O. Box 5120, Stn. F, Ottawa, Ontario, Canada K2C 3H4, Tel: 613-226-5772, TELEX: 053-4591; Empl.: 8 ..... **D•1220**

Local Sales Offices & Reps

NY Ogdensburg, Avtech Electrosystems Ltd. 315-472-5270
Can Ottawa, Ont., Avtech Electrosystems Ltd. 613-226-5772

Unitron

FAX: 214-341-2099

AVTEL DIV., UNITRON INC., 10925 Miller Rd., Dallas, TX 75238, Tel: 214-340-8600, TELEX: 882511; FSC No.: 6130; Empl.: 75; *Sls. Mgr.:* R. L. Beutel ... **D•2175-2177**

Local Sales Offices & Reps

CA Sunland, JVC Assocs. (Jim Crevier) ... 818-352-7348
NC Charlotte, Bruster Lawing & Assocs. .. 803-831-1205
VA Midlothian, Bruster Lawing & Assocs. 804-794-3879

AVX

FAX: 803-626-2442

AVX CORPORATION, Box 867, Myrtle Bch., SC 29577, Tel: 803-448-9411, TWX: 810-661-2252; FSC No.: 9K916; *Sls. Mgr.:* Allan Cole; *Dist. Mgr.:* Robert Burns ..... **A•1019-1023, 1778; B•1008**

Local Sales Offices & Reps

AL Huntsville, Beacon Elctrns. 205-881-5031
AZ Scottsdale, Interstate Mktg. 602-244-9050
CA San Diego, Interstate Mktg. 619-693-3220
CA San Jose, Quadrep Inc. 408-432-3300
CA Woodland Hills, Interstate Mktg. Assocs. 818-883-7606
CO Englewood, Thorson Rocky Mt. Inc. ... 303-779-3435
FL Casselberry, Dyne-A-Mark 305-831-2822
FL Clearwater, Dyne-a-Mark 813-441-4702
FL Fort Lauderdale, Dyne-a-Mark 305-771-6501
GA Atlanta, Beacon Elctrns. 404-256-9640
IL Chicago, M. Gottlieb Assocs. 312-775-1151
IL Itasca, Janus, Inc. 312-250-9650
IL Waukeska, Janus, Inc. 414-542-7575
IN Ft. Wayne, F.J. Campisano Co. 219-486-6443
IN Indianapolis, Frank J. Campisano 317-253-7651
IN Kokomo, M. Gottlieb Assocs. 317-455-0444
IA Cedar Rapids, R. F. Welch 319-362-6824
KS Spring Hill, Beneke & McCaul 816-765-2998
MD Baltimore, Burgin-Kreh Assocs. 301-265-8500
MA Chelmsford, J.E. Boeing Co. 617-256-5800
MI Farmington Hills, J. L. Montgomery 313-489-0099
MI Flint, M. Gottlieb Assocs. 313-732-3922
MN Minneapolis, Comstrand Inc. 612-788-9234
MO Grandview, Beneke & McCaul 816-765-2998
NJ Bellmawr, Thomas Assocs., Inc. 609-933-2600
NM Albuquerque, Thorson-Desert States, Inc. 505-293-8555
NY Ithaca, Bob Dean, Inc. 607-257-1111
NY Melville, Comtronic Assocs. 516-249-0505
NY Wappingers Falls, Bob Dean, Inc. 914-297-6406
NC Raleigh, Tingen Technical Sales 919-878-4440
OH Beaverton, Western Tech Sls. 503-644-8860
OH Cincinnati, F.J. Campisano Co. 513-574-7111
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BARNES ENGINEERING DIV., EDO Corporation, 88 Long Hill Cross Rds., Shelton, CT 06484, Tel: 203-926-1777, TELEX: 6819115, FAX: 203-926-9285; Empl.: 250; *Sls. Mgr.:* M. L. Marusic

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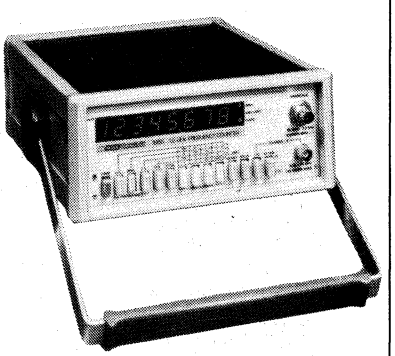

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Can Pointe Claire, Que., Designtronics 514-695-3124
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Can Willowdale, Willer Engrg., Ltd. 416-499-4421

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PA Paoli, Tyler Griffin Co. 215-647-1550

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OH Dayton, Electro Entprs. 513-426-5551
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WA Tacoma, Inspection Technlg. 509-759-9492

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Can Vancouver, BC, Madison Indl. Equip. Ltd. 604-872-8155

Local Distributors
AL Mobile, Brownell Instrs. & Control Co. 205-479-5405
AZ Phoenix, Minarik Elec. Co. 602-233-3000
CA Carson, Power Trans. Specialties 213-631-7502
CA Fremont, Elec. Motor Svc. 415-651-2706
CA Glendale, Minarik Elec. Co. 818-507-6500
CA Newark, Republic Supp. Co. 415-794-9019,
CA San Diego, Minarik Elec. Co. 619-560-6632
CA Santa Clara, Minarik Elec. Co. 408-727-0575
CO Denver, Wazee Elec. Co. 303-623-8658
CT Berlin, B & B Motor & Control 203-828-8550
CT Hartford, Machine Drives & Controls .. 203-728-0403
CT Norwalk, Machine Drives & Controls .. 203-846-2007
FL Hialeah, Condo Elec. & Ind. Supp., Inc. 305-691-5400
FL Jacksonville, Electrical-Mech. Dr., Inc. 904-731-9977
FL Orlando, Brownell Instrs. & Conts. Co. 407-843-6770
FL Tampa, Electrical-Mech. Dr., Inc. 813-621-8675
GA Hapeville, Brownell Instrs. & Conts. Co. 404-762-5181
GA Tucker, Research Designs, Inc. 404-491-0745
IL Chicago, Excel Elec. Svc. Co. 312-421-7220
IL Franklin Pk., Flolo Corp. 312-595-1010
IL Rockford, Tek-Matic, Inc. 815-282-1775
IN Indianapolis, B & B Motor & Control ... 317-248-0396
KS Kansas City, Kornfeld Thorp Elec. 913-321-7070
MD Baltimore, Advent Electric Inc. 301-532-8149,
MA Medford, Empire Elctrl. Co. 617-395-5000
MA Somerville, Electro Sls. Co., Inc. 617-666-0500
MI Detroit, Howard Elec. Co. 313-923-0430
MI Grand Rapids, MacKay Ind. Sls. 616-241-1671
MI Novi, Reserve Motion Control Sys. 313-473-1370
MN Minneapolis, Boustead Elec. & Mfg. ... 612-544-9131
MO St. Louis, State Elec. Co. 314-569-2140
MO St. Louis, Zeller Elec., Inc. 314-638-9641
NE Omaha, Precision Bearing Co. 402-593-7050
NH Manchester, Empire Elctrl. 603-627-6630
NJ Cherry Hill, Jos. T. Fewkes & Co. 609-424-5810
NY Binghamton, K. J. Elec. Corp. 607-772-1760
NY East Syracuse, K. J. Elec. Corp. 315-437-2826
NY Long Island City, B & B Motor & Control 718-784-1313
NY Rochester, B & B Motor & Control 716-424-7040
NC Charlotte, Brownell Instrs. & Conts. Co. 704-597-1270
NC Charlotte, Piedmont Motor &Control Ltd. 704-523-7121,
OH Dayton, Thal Mor Assoc., Inc. 513-298-9939
OH Middleburg Hgts., Reserve Motion Control Sys. 216-826-0290
OK Oklahoma City, Evans Elec. Mtr. Ctrs., Inc. 405-631-1344
OK Tulsa, Southwest Drives, Inc. 918-665-1455
OR Portland, North Coast Elec. 503-281-8888
PA Altoona, Miller Elec. Svc. & Supp. 814-942-9943
PA Bridgeport, Advent Elec., Inc. 215-277-6610
PA Pittsburgh, Braunlich-Roessle 412-471-6995
SC Taylors, B & B Motor & Control 803-268-5702
TN Memphis, Brownell Instrs. & Conts. Co. 901-795-8487
TN Nashville, Electric Motor Rewind, Inc. 615-256-2522,
TN Nashville, Tennessee Machinery Co. .. 615-244-8150
TX Dallas, Motion Inds. 214-351-2211
TX Dallas, Purvis Bearing Svc. 214-358-5588
TX Houston, B & B Motor & Control 713-820-7931
TX Houston, Research Des., Inc. 713-995-8591
TX San Antonio, Minarik Elec. Co. 512-822-7097
VA Richmond, Ind. Supp. Corp. 804-355-8041
WA Seattle, Indl. Elec. Mtr. & Mach., Inc. ... 206-329-3900
WI Milwaukee, Trester Svc. Elec. 414-264-8170
WI New Berlin, Elec. Sls. & Engrg. 414-782-2400
Can Brantford, Ont., Renold Canada 800-265-9970
Can Edmonton, Alberta, Soper's Supp. Ltd. 403-423-4066
Can Montreal, Que., Lalonde Elec., Inc. 514-524-7507
Can Mt. Royal, Que., Renold Canada 514-731-3591
Can Scarborough, Ont., Toronto Elec. 416-755-7716
Can Toronto, Renold Canada Ltd. 416-453-2190,
Can Vancouver, B.C., Armature Elec. 604-879-6141
Can Vancouver, BC, Renold Canada Ltd. .. 604-255-8455

BOEING ELECTRONICS, P.O. Box 24969, M/S 9N-41, Seattle, WA 98124-6269, Tel: 206-657-7474, TELEX: 329430, FAX: 206-657-8883; Empl.: 5500; *Sls. Mgr.:* R.F. Priebe

BOGEN COMMUNICATIONS, INC.

FAX: 201-934-9832

BOGEN COMMUNICATIONS, INC., MPD Products, 50 Spring St., P.O. Box 575, Ramsey, NJ 07446, Tel: 201-934-8500, TWX: 710-990-5047; *Sls. Mgr.:* Christopher Wildfoerster ..... **C•1294**

Local Sales Offices & Reps

AZ	Scottsdale, Dar-C Inc.	602-948-2240
CA	Pleasonton, Moulthrop Sls.	415-463-0450
CA	San Diego, Tauber Assocs.	619-274-7242
CO	Englewood, Comp. Sls.	303-779-8060
FL	Tampa, SRT Mktg.	813-884-4805
IL	Palatine, Technlg. Sls.	312-991-6600
IN	Indianapolis, Marketing Engrg.	317-872-5665
KS	Overland Park, Spectrum Sls.	913-648-6811
MA	Burlington, Conti Younger	617-273-1582
MI	Brighton, A. P. Assocs.	313-229-6550
MN	Eden Prarie, Electro Mark	612-944-5850
MO	St. Louis, Spectrum Sls.	314-731-5151
NJ	Berkeley Hgts., Cambridge Allen & Assocs.	201-464-0203
NY	Mendon, Tech-Mark, Inc.	716-624-3840
NC	Greensboro, Hile Sls., Inc.	919-288-1500
OR	Beaverton, Advanced Power Prods.	503-646-0994
PA	Philadelphia, Samuel K. Macdonald, Inc.	215-659-4414
TX	Dallas, Dunbar	214-239-7151
UT	Salt Lake City, Comp. Sls.	801-268-8440
WI	Waukesha, Technlg. Sls.	414-786-5015
Can	Ontario, White Radio Ltd.	416-632-6894

Local Distributors

AL	Huntsville, Resistacap, Inc.	205-883-4270
AZ	Scottsdale, Electro Mark	602-991-0110
CA	San Diego, Tauber Elec.	619-272-7242
CA	San Jose, Rose Elctrns.	408-263-2934
CA	Santa Clara, Cypress Elctms., Inc.	408-980-2500
CA	Van Nuys, Nesco	213-781-0505
CO	Arvada, Denver Beta Wintronics	303-431-7161
FL	Boca Raton, Plainview Elctrns.	305-997-7705
IL	Morton Grove, Power Pak	312-966-6000
IN	Indianapolis, Bell Elctrns.	317-875-8200
IN	Indianapolis, Elctrn. Prod. Concepts	317-872-5665
MA	Canton, Impact Sls.	617-821-1500
MA	Danvers, Generation Elctrns.	617-777-4866
MA	Sharon, Adcour	617-784-8123
MI	Brighton, A. P. Sls.	313-227-3604
MN	Minneapolis, Stark Elctrns.	612-332-1325
MN	Thief River Falls, Digi Key	218-681-6674
NJ	Camden, Gen. Radio Supp.	609-964-8560
NJ	Clifton, Engrd. Assemblies Corp.	800-4-Battery
NJ	Plainfield, Mars Elec.	201-757-4332
NY	Buffalo, Summit Dist.	716-887-2800
OR	Beaverton, Micro Power Elctrns.	503-626-7086
PA	Philadelphia, Powell Elctrns.	215-365-1900
TX	Dallas, Computer Comps.	214-239-0271
WI	Milwaukee, Taylor Elctrns.	414-241-4321
Can	Ontario, White Radio Ltd.	416-632-6894

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BOGEN COMMUNICATIONS, INC., 50 Spring St., P.O. Box 575, Ramsey, NJ 07446, Tel: 201-934-8500, TWX: 710-990-5047, FAX: 201-934-9832 ..... **C•1294**

BOKER'S, INC., 3104 Snelling Ave., Minneapolis, MN 55406-1937, Tel: 612-729-9365, FAX: 612-729-8910; FSC No.: 85446; Empl.: 110; *Sls. Mgr.:* Andy Tscholl

BOMAR CRYSTAL, 201 Blackford Ave., Middlesex, NJ 08846, Tel: 201-356-7787, 800-526-3935, FAX: 1-201-356 7362; Empl.: 75; *Sls. Mgr.:* Steve Weinstein

BOMCO, See MuShield Co.

BONAR KARD-O-LITE, INC., 421 Feheley Dr., King of Prussia, PA 19406, Tel: 215-277-2910, FAX: 215-277-2956; Empl.: 30; *Sls. Mgr.:* Robert Gorra ..... **B•1132**

BOONTON

FAX: 201-584-3037

BOONTON ELECTRONICS CORP., 791 Route 10, Randolph, NJ 07869, Tel: 201-584-1077, TWX: 710-986-8215 BOONTRONICS; FSC No.: 04901; Empl.: 180; *Sls. Mgr.:* R. Morrell ..... **D•1231**

Local Sales Offices & Reps

AL	Huntsville, Sci. Devices	205-536-1969
AZ	Phoenix, Aztec Entprs.	602-944-9185
CA	North Hollywood, O'Halloran Assocs.	213-877-0173
CA	Palo Alto, O'Halloran Assocs.	415-969-1600
CO	Denver, Aztec Entprs.	303-779-5285
CT	Mt. Carmel, Sci. Devices	203-248-9361
FL	Orlando, Sci. Devices	305-841-8180
IL	Elmhurst, Sector Engrg. Sls., Inc.	312-530-7850
IN	Indianapolis, Sector Engrg. Sls., Inc.	317-842-1120
KS	Lenexa, Ramsey Assoc.	913-541-1007
MD	Lanhan, Sel-Tronics	301-731-8080
MA	Lexington, R. J. Sickles	617-862-5100
MN	Minneapolis, Sector Engrg. Sls., Inc.	612-593-1809
MO	Maryland Hgts., Ramsey Assoc.	314-878-5042
NJ	Teaneck, Sci. Devices	201-837-1004
NM	Albuquerque, Aztec Entprs.	505-262-1688
NY	Rochester, Sci. Devices	716-334-2445
NC	Winston-Salem, Sci. Devices	919-765-5776
OH	Centerville, Micro Sls.	513-433-8171
PA	Melrose Park, R. Meyers	215-224-1663
TX	Austin, Testech	512-327-7033
TX	Richardson, Testech	214-644-5010
UT	Ogden, Aztec Entprs.	801-621-1655
WA	Bellevue, Sci. Devices	206-747-5169
WI	Milwaukee, Sector Engrg. Sls., Inc.	414-352-8280

BOPLA ENCLOSURES, 7330 Executive Way, Frederick, MD 21701, Tel: 301-696-9300, FAX: 301-696-9494; FSC No.: 4Y520; Empl.: 35; *Sls. Mgr.:* Andy Kassman ..... **C•1012**

Local Sales Offices & Reps

CA	Irvine, Comp. Mktg. Assocs.	714-951-5950
FL	Tampa, FL Comp. Sls.	813-960-7044
IL	Chicago, Paddock Mktg./Sls.	312-452-7852
IN	Nobelsville, R & D Elctrns.	317-849-2026
MA	Needham, T.E.S.C.O.	617-444-7925
PA	Lancaster, Indl. Comps. Inc.	215-889-0650
VA	Reston, Colrud Corp.	703-620-6621
WA	Federal Way, K. R. Jensen Sls.	206-874-2772

Local Distributors

MA	Framingham, Now Elctrns.	617-872-5876
OR	Portland, Radar Elctrns.	503-232-3404
PA	Harrisburg, Cumberland Elctrns.	717-232-5999
PA	Lancaster, Peak Elctrns.	215-293-9000
WA	Seattle, Radar Elec.	206-282-2511

BORG-WARNER THERMOELECTRICS, BORG-WARNER CORP., See TECA, ThermoElectric Cooling America Corp.

BOSCH, ROBERT, CORP., 2800 S. 25th Ave., Broadview, IL 60153, Tel: 312-865-5200, TELEX: 23-5563, FAX: 312-865-6429; *Sls. Mgr.:* Dieter Bloecks; *Dist. Mgr.:* Dave Robson

Local Sales Offices & Reps

AL	Huntsville, Hughes Assocs.	205-533-9281
AZ	Scottsdale, Luscombe Engrg.	602-949-9333
CA	Campbell, Luscombe Engrg.	408-370-2020
CA	Montrose, Luscombe Engrg.	818-249-9000
CA	Pasadena, Luscombe Engrg.	213-684-2000
CO	Longmont, Piper Sls.	303-651-2378
CT	Madison, Conti Younger Assocs.	203-245-1136
GA	Norcross, 20th Century Mktg.	404-446-1999
IL	Woodridge, Trend-Tronics, Inc.	312-985-0626
IA	Davenport, Rush & West Assocs.	319-388-9494
MA	Burlington, Conti Younger	617-273-1582
MA	Burlington, Conti-Younger Assocs.	617-273-1582
MI	Sterling Hgts., Geotronix	313-254-0520
MN	Minneapolis, H.M.R., Inc.	612-888-2122
MO	Ballwin, Rush & West Assocs.	319-394-7271
MO	St. Louis, Rush & West Assocs.	314-965-3322
NY	Liverpool, Bradnon Assocs.	315-652-3954
NY	Yonkers, Sonkin Assocs.	914-968-8282
NC	Raleigh, 20th Century Mktg.	919-782-4624
OH	Richfield, Geotronix Inc.	216-659-6100
PA	Cornwells Hts., William Staats Co.	215-639-5231
PA	Norristown, Brandon Assocs.	215-278-0500
TN	Memphis, 20th Century Mktg.	901-756-4681
TX	Dallas, P.J. Scanlon Co.	214-231-4661
TX	Lewisville, Jim Hughes Co.	214-221-1536
WA	Mercer Island, Electronic Comp. Sls.	206-232-9301

BOSCHERT, INC., Computer Products/Boschert, 3797 Spinnaker Ct., Fremont, CA 94538, Tel: 415-657-6700, FAX: 415-683-6400 ..... **D•1684, 1699**

Refer to Computer Products, Inc., Fremont, CA, for sales offices, Reps. and Distributors.

BOSCHERT, INC., See Computer Products, Inc.

BOURNS

BOURNS, INC., Resistive Components Group, 1200 Columbia Ave., Riverside, CA 92507, Tel: 714-781-5050, TWX: 910-332-1252; Empl.: 6000; *Sls. Mgr.:* Dennis Lause; *Dist. Mgr.:* Vince Ingrao ..... **A•1876-1877, 2084-2087**

Local Sales Offices & Reps

AL	Huntsville, CSR Elctrns.	205-533-2444
AZ	Phoenix, Summit Sls.	602-998-4850
CA	Calabasas, Quad Rep. Inc.	818-887-4219
CA	Irvine, Quad Rep. Inc.	714-261-6706
CA	San Diego, Quad Rep.Inc.	619-560-8330
CA	San Jose, QuadRep, Inc.	408-946-4000
CO	Parker, Parker Webster	303-841-4888
FL	Altamonte Springs, Dyne-A-Mark	305-831-2097
FL	Clearwater, Dyne-A-Mark	813-441-4702
FL	Ft. Lauderdale, Dyne-A-Mark	305-771-6501
FL	Palm Bay, Dyne-A-Mark	305-727-0192
GA	Atlanta, CSR Elctrns.	404-396-3720
ID	Boise, Intermountain Technlg.	208-322-5022
IN	Carmel, Technlg. Mktg. Corp.	317-844-8462
IN	Ft. Wayne, Technlg. Mktg. Corp.	219-432-5553
IA	Cedar Rapids, REP Assocs. Corp.	319-373-0152
KY	Louisville, Technlg. Mktg. Corp.	502-499-7808
MD	Baltimore, Micro-Comp.	301-247-0400
MA	Lexington, John E. Boeing Co.	617-862-2500
MI	Detroit, Rathburg Assocs.	313-882-1717
MN	Edina, Mel Foster	612-941-9790
MO	Bridgeton, Centech	314-291-4230
MO	Raytown, Centech	816-358-8100
NJ	Bellmawr, Thomas Assocs.	609-933-2600
NY	Ithaca, Bob Dean	607-257-1111
NY	Melville, Comtronic Assocs.	516-249-0505
NC	Raleigh, CSR Elctrns.	919-878-9200
OH	Richfield, Bear Mktg.	216-659-3131
OK	Oklahoma City, Ammon & Rizos	405-942-2552
OR	Portland, J. J. Backer	503-297-8744
OR	Salem, J. J. Backer	503-362-0717
TX	Austin, Ammon & Rizos	512-454-5131
TX	Dallas, Ammon & Rizos	214-644-5591
TX	Houston, Ammon & Rizos	713-781-6240
UT	Salt Lake City, Parker Webster	801-266-9939
VA	Huddleston, Micro-Comp	301-247-0400
WA	Seattle, J. J. Backer	206-285-1300

Local Distributors

AL	Huntsville, Hall-Mark Elctrns.	205-837-8700
AL	Huntsville, Hamilton/Avnet Elctrns.	205-837-7210
AL	Huntsville, Pioneer/Washington	205-837-9300
AL	Huntsville, Schweber	205-882-2200
AZ	Phoenix, Hall-Mark Elctrns.	602-243-6601
AZ	Phoenix, Schweber Elctrns.	602-997-4874
AZ	Phoenix, TTI	602-861-0222
AZ	Tempe, Bell Inds.	602-966-7800

AZ Tempe, Elctrn. Supp. 602-258-4769
AZ Tempe, Hamilton/Avnet 602-231-5100
CA Canoga Park, Schweber Elctrns. 213-999-4702
CA Chatsworth, Avnet Elctrns. 213-700-2600
CA Chatsworth, TTI 818-709-1010
CA Citrus Hts, Hall-Mark Elctrns. 916-443-7282
CA Compton, Harper S.I.D. 213-979-5090
CA Costa Mesa, Avnet Elctrns. 213-558-2313
CA Costa Mesa, Avnet Elctrns. 714-754-6111
CA Costa Mesa, Hamilton Elctrns. 714-641-4100
CA Culver City, Hamilton Electro Sls. 213-558-2121
CA Culver City, Hamilton Electro Sls. 213-558-2883/84
CA El Segundo, Hall-Mark Elctrns. 213-643-9101
CA Garden Grove, Bell Inds. 213-444-0301
CA Gardena, Bell Inds. 213-515-1800
CA Irvine, Schweber Elctrns. 714-863-0261
CA Irvine, Schweber Elctrns. 714-556-3880
CA Oakland, Brill Elctrns. 415-834-5888
CA Riverside, Elctrn. Supp. Corp. 714-787-9220
CA Roseville, Bell Inds. 916-969-3100
CA Sacramento, Hamilton/Avnet 916-920-3150
CA Sacramento, Schweber Elctrns. 916-929-9732
CA San Diego, Bell Inds. 619-268-1277
CA San Diego, Elctrn. Supp. 619-278-5020
CA San Diego, Hall-Mark Elctrns. 619-268-1201
CA San Diego, Hamilton/Avnet 619-571-7500
CA San Jose, TTI 408-943-9155
CA Santa Ana, Teknopak 714-558-8840
CA Santa Clara, Schweber Elctrns. 408-496-0200
CA Santa Clara, Schweber Elctrns. 408-748-4700
CA Sunnyvale, Bell Inds. 408-734-8570
CA Sunnyvale, Hall-Mark Elctrns. 408-773-9990
CA Sunnyvale, Hamilton/Avnet 408-743-3300
CA Tustin, Hall-Mark Elctrns. 714-669-0681
CA Woodland Hills, Avnet Elctrns. 213-884-3322
CO Denver, Newark Elctrns. 303-757-3351
CO Englewood, Hall-Mark Elctrns. 303-790-1662
CO Englewood, Hamilton/Avnet 303-779-9998
CO Wheat Ridge, Bell Inds. 303-424-1985
CT Danbury, Hamilton/Avnet 203-797-2856
CT Danbury, Schweber Elctrns. 203-792-3500
CT Hamden, Almo Elctrns. Corp. 203-288-6556
CT Norwalk, Pioneer Std. 203-853-1515
CT Statford, TTI 203-375-1400
CT Wallingford, Midan Elctrns. 203-265-2077
FL Altamonte Springs, Pioneer Std. 305-834-9090
FL Altamonte Springs, Schweber Elctrns. 305-331-7555
FL Clearwater, Hall-Mark Elctrns. 813-530-4543
FL Dania, Summit Distrs. 305-920-6253
FL Ft. Lauderdale, Hall-Mark Elctrns. 305-971-9280
FL Ft. Lauderdale, Hamilton/Avnet 305-971-2900
FL Ft. Lauderdale, Hammond Elctrns. 305-973-7103
FL Ft. Lauderdale, Pioneer/Washington 305-771-7520
FL Hollywood, Schweber Elctrns. 305-927-0511
FL Largo, Graham Elctrns. 813-541-4434
FL Orlando, Hall-Mark 305-855-4020
FL Orlando, Hammond Elctrns. 305-849-6060
FL Orlando, Pioneer/Orlando 305-834-9090
FL Orlando, TTI 305-859-1000
FL St. Petersburg, Hall-Mark Elctrns. 813-576-8691
FL St. Petersburg, Hamilton/Avnet 813-576-3930
FL Winter Park, Hamilton/Avnet 305-628-3888
GA Norcross, Hall-Mark Elctrns. 404-447-8000
GA Norcross, Hamilton/Avnet 404-447-7500
GA Norcross, Hammond Elctrns. 404-449-1996
GA Norcross, Pioneer/Washington 404-448-1711
GA Norcross, Schweber Elctrns. 404-449-9170
GA Norcross, TTI 404-662-0911
IL Bensenville, Hall-Mark Elctrns. 312-860-3800
IL Bensenville, Hamilton/Avnet 312-860-8523
IL Chicago, Bell Inds. 312-982-9210
IL Chicago, Newark Elctrns. 312-638-4411
IL Elk Grove Village, Pioneer Std. 312-437-9680
IL Elk Grove Village, Schweber Elctrns. 312-364-3750
IL Palatine, Ohm Elctrns. 312-359-5500
IN Carmel, Hamilton/Avnet 317-844-9333
IN Fort Wayne, Graham Elctrns. 219-423-3422
IN Indianapolis, Graham Elctrns. 317-634-8202
IN Indianapolis, Pioneer Std. Elctrns. 317-849-7300
IN Lafayette, Graham Elctrns. 317-423-5564
IA Cedar Rapids, Bell Inds. 319-395-0730
IA Cedar Rapids, Hamilton/Avnet 319-362-4757
IA Cedar Rapids, Schweber Elctrns. 319-373-1417
KS Lenexa, Hall-Mark Elctrns. 913-888-4747
KS Overland Park, Schweber Elctrns. 913-492-2921
KS Overland Pk., Hamilton/Avnet Elctrns. 913-888-8900
MD Baltimore, Radio Elec. Svc. Co. 301-529-0500
MD Beltsville, Radio Elec. Svc. Co. 202-937-9100
MD Columbia, Hall-Mark Elctrns. 301-796-9300
MD Columbia, Hamilton/Avnet 301-995-3500
MD Gaithersburg, Almo Elctrns. Corp. 301-670-0090
MD Gaithersburg, Pioneer/Washington 301-921-0660
MD Gaithersburg, Schweber Elctrns. 301-840-5900
MA Bedford, Schweber Elctrns. 617-275-5100
MA Canton, Almo Elctrns. Corp. 617-821-1450
MA Lexington, Pioneer Std. 617-863-1200
MA Norwood, Gerber Elctrns. 617-769-6000
MA Woburn, Hall-Mark Elctrns. 617-935-9777
MA Woburn, Hamilton/Avnet 617-273-7500
MI Flint, RS Elctrns. 313-762-5800
MI Grand Rapids, Hamilton/Avnet 616-243-8805
MI Grand Rapids, RS Elctrns. 616-241-3483
MI Kalamazoo, RS Elctrns. 616-381-5470
MI Livonia, Hamilton/Avnet 313-522-4700
MI Livonia, Pioneer Std. Elctrns. 313-525-1800
MI Livonia, RS Elctrns. 313-525-1155
MI Livonia, Schweber Elctrns. 313-525-8100
MI Roseville, RS Elctrns. 313-779-2450
MI Wyandotte, RS Elctrns. 313-AV2-5880
MN Bloomington, Hall-Mark Elctrns. 612-854-3223
MN Eden Prairie, Schweber Elctrns. 612-941-5280
MN Edina, Schweber Elctrns. 612-941-5280
MN Minneapolis, Newark Elctrns. 612-331-6350
MN Minnetonka, Hamilton/Avnet 612-932-0600
MN Minnetonka, Pioneer Std. Elctrns. 612-935-5444
MO Earth City, Hamilton/Avnet 314-344-1200
MO Earth City, Schweber Elctrns. 314-739-0526
MO Maryland Hts, Hall-Mark Elctrns. 314-291-5350
NH Hudson, C&H Elctrns. 603-882-1133
NH Manchester, Schweber Elctrns. 603-625-2250
NJ Camden, General Radio 609-964-8560
NJ Cherry Hill, Hall-Mark Elctrns. 609-424-7300
NJ Cherry Hill, Hamilton/Avnet 609-424-0110
NJ Clifton, J-Mar Elctrns. 201-772-6400
NJ Fairfield, Hall-Mark Elctrns. 201-575-4415
NJ Fairfield, Hamilton/Avnet 201-575-3390
NJ Fairfield, Schweber Elctrns. 201-227-7880
NJ Pine Brook, Pioneer Std. 201-227-1262
NM Albuquerque, Bell Inds. 505-292-2700
NM Albuquerque, Hamilton/Avnet Elctrns. 505-765-1500
NY Bohemia, TTI 516-567-1500
NY Buffalo, Summit Distrs. 716-884-3450
NY E. Syracuse, Hamilton/Avnet 315-437-2647
NY Fairport, Pioneer-Harvey 716-381-7070
NY Hauppauge, Hamilton/Avnet 516-231-9800
NY Hauppauge, Mast Distrs. 516-273-4422
NY Hauppauge, Pioneer-Harvey 516-231-9200
NY Melville, Hamilton/Avnet 516-454-6000
NY Rochester, Hamilton/Avnet Elctrns. 716-475-9130
NY Rochester, Schweber Elctrns. 716-424-2222
NY Rochester, Summit Distrs. 716-334-8110
NY Ronkonkoma, Hall-Mark Elctrns. 516-737-0600
NY Vestal, Pioneer Std. 607-748-8211
NY Westbury, Schweber Elctrns. 516-334-7474
NC Charlotte, Pioneer/Washington 704-527-8188
NC Greensboro, Hammond Elctrns. 919-275-6391
NC Raleigh, Hall-Mark Elctrns. 919-872-6286
NC Raleigh, Hall-Mark Elctrns. 919-872-0712
NC Raleigh, Hamilton/Avnet 919-878-0819
NC Raleigh, Schweber Elctrns. 919-876-0000
OH Beachwood, Schweber Elctrns. 216-464-2970
OH Cincinnati, Hall-Mark Elctrns. 513-563-5980
OH Cincinnati, Hughes-Peters 513-351-2000
OH Cleveland, Hamilton/Avnet 216-831-3500
OH Cleveland, Pioneer Std. 216-587-3600
OH Columbus, Graham Elctrns. 614-895-1590
OH Columbus, Hughes-Peters 614-294-5351
OH Dayton, Bell Inds. 513-434-8213
OH Dayton, Hamilton/Avnet 513-433-0610
OH Dayton, Pioneer Std. 513-236-9900
OH Dayton, Schweber Elctrns. 513-439-1800
OH Maumee, RS Elctrns. 419-893-0721
OH Solon, Hall-Mark Elctrns. 216-349-4632
OH Westerville, Hall-Mark Elctrns. 614-891-4555
OK Tulsa, Hall-Mark Elctrns. 918-665-3200
OK Tulsa, Schweber Elctrns. 918-622-8000
OR Beaverton, Almac Elctrns. 503-641-9070
OR Lake Oswego, Bell Inds. 503-241-4115
OR Lake Oswego, Hamilton/Avnet Elctrns. 503-635-8831
PA Horsham, Pioneer/Washington 215-674-4000
PA Horsham, Schweber Elctrns. 215-441-0600
PA Philadelphia, Almo Elctrns. Corp. 215-698-4000
PA Pittsburgh, Almo Elctrns. Corp. 412-931-5990
PA Pittsburgh, Pioneer Std. Elctrns. 412-782-2300
PA Pittsburgh, Schweber Elctrns. 412-782-1600
SC Greenville, Hammond Elctrns. 803-233-4121
TN Nashville, Graham Elctrns. 615-242-2682
TX Austin, Hall-Mark Elctrns. 512-258-8848
TX Austin, Hamilton/Avnet 512-837-8911
TX Austin, Harrison Equip. Co. 512-458-3555
TX Austin, Pioneer Std. Elctrns. 512-835-4000
TX Austin, Schweber Elctrns. 512-458-8253
TX Dallas, Hall-Mark Elctrns. 214-343-5000
TX Dallas, Hall-Mark Elctrns. 214-341-1147
TX Dallas, Harrison Equip. Co. 214-239-2750
TX Dallas, Pioneer Std. Elctrns. 214-386-7300
TX Dallas, Schweber Elctrns. 214-661-5010
TX El Paso, Ideal Indl. Elctrn. Supp. 915-779-6647
TX Fort Worth, TTI 214-429-1440
TX Houston, Hall-Mark Elctrns. 713-781-6100
TX Houston, Hamilton/Avnet 713-975-3501
TX Houston, Harrison Equip. Co. 713-879-2600
TX Houston, Pioneer Std. 713-988-5555
TX Houston, Pioneer Std. Elctrns. 214-386-7300
TX Houston, Schweber Elctrns. 713-784-3600
TX Irving, Hamilton/Avnet 214-659-4100
TX Stafford, Harrison Equip. 713-879-2600
UT Salt Lake City, Bell Inds. 801-972-6969
UT Salt Lake City, Hamilton/Avnet 801-972-2800
WA Bellevue, Almac Elctrns. 206-643-9992
WA Bellevue, Bell Inds. 206-747-1515
WA Bellevue, Hamilton/Avnet 206-643-3950
WI Brookfield, Schweber Elctrns. 414-784-9020
WI Mequon, Taylor Elec. 414-241-4321
WI Milwaukee, Electronic Expd. 414-228-8100
WI New Berlin, Hamilton/Avnet 414-784-4510
WI Oak Creek, Hall-Mark Elctrns. 414-761-3000
WI Waukesha, Bell Inds. 414-547-8879

BOURNS INSTRUMENTS INC., 1200 Columbia, Riverside, CA 92507, Tel: 714-781-5148, TWX: 910-332-6103; Empl.: 220; *Sls. Mgr.:* Dennis Dalbeck

BOWMAR INSTRUMENT CORP., Aerospace Div., 8000 Bluffton Rd., Ft. Wayne, IN 46809, Tel: 219-747-3121, TWX: 810-332-1510; FSC No.: 99479; Empl.: 215; *Sls. Mgr.:* Gary McClintick

BOWMAR INSTRUMENT CORP., Data Entry Division, 4640 126th Ave. N., Clearwater, FL 34622-4796, Tel: 813-573-2525, TWX: 810-863-0375, FAX: 813-573-1317; Empl.: 100; *Sls. Mgr.:* Walter Kunz

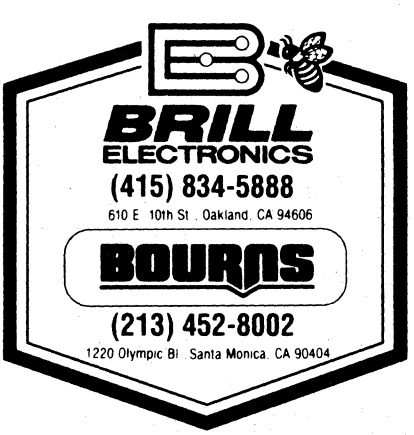
BOWMAR TELECOMMUNICATIONS DIV., 531 Main St., Acton, MA 01720, Tel: 508-263-8365, TWX: 710-347-1441, FAX: 617-263-3358; Empl.: 60; *Sls. Mgr.:* John Hyatt ..... **D•1379**

Local Sales Offices & Reps

CA Palo Alto, Mollard Mktg. 415-961-0456
CA Santa Ana, Brooks-Moore & Assocs. 714-541-2044
CO Commerce City, Meas. Consits. 303-286-1414
FL Lakeland, Curry Controls 813-646-5781
GA Atlanta, Cascade Controls 404-587-1368
IL Des Plaines, Lincoln, Hodges & Assocs. 312-297-3810
KS Overland Park, Barry Sls. 913-642-0270
LA Baton Rouge, Mid-South Sls. 504-924-0106
LA Lake Charles, Mid South Sls. 318-433-0356
LA Slidell, Mid-South Sls. 504-641-7480
MD Columbia, Tyler Griffin Co. 301-995-1215
MA Billerica, Eastronix, Inc. 508-670-2400
MI Livonia, Amtech Reps. 313-474-8300
MN Minneapolis, Waltam Sls. Co. 612-781-2778
MO St. Louis, Barry Sls. 314-821-2525
NJ Perth Amboy, Cosine, Inc. 201-442-3600
NM Albuquerque, Meas. Consits. 303-286-1414
NY Clarence, EIL/Trott Elctrns. 716-634-8500
NY Pittsford, EIL/Trott Elctrns. 716-586-8251
NC Charlotte, EIL/Trott Elctrns. 704-376-2237
OH Dayton, J. C. Hofstetter Co. 513-296-1010
OH Medina, J. C. Hofstetter Co. 216-241-4880
OR Portland, Frank Jackson Assocs. 503-645-8511
PA Hickory, J. C. Hofstetter Co. 412-356-2305
PA Paoli, Tyler Griffin Co. 215-647-1550
TN Knoxville, EIL/Trott Elctrns. 615-525-9871
TX Carrollton, Seaton Corp. 214-380-0414
UT Centerville, Measurement Consits. 801-298-3388
WA Redmond, Frank Jackson Assocs. 206-881-7277
WI Janesville, Lincoln, Hodges & Assocs. 608-754-4214,414-542-3087

Local Distributors

CA Los Angeles, EIL Instrs. 213-685-7020
CA Sunnyvale, EIL Instrs. 408-245-4320



CO Denver, EIL Instrs. 303-534-4160
CT Middleton, EIL Instrs. 203-346-6646
FL Palm Bay, EIL Instrs. 407-725-8300
IL Bridgeview, EIL Instrs. 312-430-2292
IN Indianapolis, EIL Instrs. 317-545-1373
KY Louisville, EIL Instrs. 502-454-3420
MD Sparks, EIL Instrs. 301-771-4800
MA Burlington, EIL Instrs. 617-272-9450
NJ Pennsauken, EIL Instrs. 609-488-0474
NY Hauppauge, EIL Instrs. 516-231-6333
OH Dayton, EIL Instrs. 513-435-2134
PA Pittsburgh, E.I.L. 412-823-2255
TX Dallas, EIL Instrs. 214-931-1236
TX Houston, EIL Instrs. 714-271-3100
VA Springfield, EIL Instrs. 703-569-2611
WA Redmond, EIL Instrs. 206-882-3222

BP MICROSYSTEMS, 10681 Haddington, Ste. 190, Houston, TX 77043, Tel: 713-461-9430, 1-800-225-2102, TELEX: 1561477, FAX: 713-461-7413; Empl.: 7

BRADFORD ELECTRONICS, INC., 550 High Street, Bradford, PA 16701, Tel: 814-362-5700, TELEX: 914496, FAX: 814-362-5635; FSC No.: 24546; Empl.: 225; *Sls. Mgr.:* Gerald M. Miller; *Dist. Mgr.:* Jon Trabert ..... **A•1024-1025, 1879-1889**

Local Sales Offices & Reps

AL Huntsville, JWL Assocs. 205-883-1712
AZ Tempe, Bradford Sls. Off. 602-966-0291
CA Los Alamitos, Reed Elctrns. Mktg. 213-598-6676
CA Redwood City, J. S. Heaton Co. 415-367-9000
CA San Diego, Bradford Sls. Off. 619-690-5112
CO Colorado Springs, Bradford Sls. Off. ... 303-593-7529
CO Loveland, Bradford Sls. Off. 303-667-7500
CT Guilford, Kaelber & Mack 203-389-8643
FL Coral Springs, Graham Assocs. Inc. ... 305-775-6733
FL Melbourne, Graham Assocs, Inc. 407-773-6631
FL Palm Bch. Gdns., Graham Assocs. Inc. 407-622-4049
FL Winter Gdn., Graham Assocs. Inc. 407-656-9369
GA Atlanta, JWL Assocs. 404-320-7643
IL Skokie, IRI 312-967-8430
IN Ft. Wayne, Scott Elctrns. 219-489-5690
IN Indianapolis, Scott Elctrns. 317-841-0010
KS Shawnee Mission, Bradford Sls. Off. .. 913-432-9140
MD Glen Burnie, Tri-Mark 301-761-6000
MA Wakefield, Howard C. Jappe Co. 617-245-9359
MI Plymouth, Jay Mktg. Assocs. 313-459-1200
MN Bloomington, IRI 612-854-1120
NJ Fairlawn, Kaelber & Mack 201-797-7865
NY Commack, Kaelber & Mack 516-499-2924
NY Liverpool, Bradford Sls. Off. 315-457-1401
NC Pineville, JWL Assocs. 704-541-5750
NC Raleigh, JWL Assocs. 919-787-4836
OH Cincinnati, Scott Elctrns. 513-791-2513
OH Cleveland, Scott Elctrns. 216-473-5050
OH Dayton, Scott Elctrns. 513-294-0539
OH Reynoldsburg, Scott Elctrns. 614-863-1281
OR Beaverton, LD Elctrns. 503-684-5571
PA Horsham, TMI 215-441-4300
TX Dallas, E. F. Aymond Co. 214-826-7620
TX San Antonio, E. F. Aymond Co. 512-675-8339
WA Snohomish, LD Elctrns. 206-568-0511
WA Spokane, LD Elctrns. 509-922-4883
WI Milwaukee, IRI 414-259-0965
Can Scarborough, Ont., Bradford Elctrns., Inc. 514-483-3812

Local Distributors

AL Huntsville, Schweber Elctrns. 205-895-0480
AZ Phoenix, Schweber Elctrns. 602-997-4874
AZ Tempe, Acacia/VNR Elctrns. 602-894-2874
AZ Tempe, Bell Inds. 602-966-7800
AZ Tempe, Schweber Elctrns. 602-431-0030
AZ Tempe, Shelley-Ragon, Inc. 602-894-2058
AZ Tempe, T.T.I., Inc. 602-431-1191
CA Canoga Pk., Schweber Elctrns. 818-999-4702
CA Chatsworth, Shelley-Ragon, Inc. 818-998-3333
CA Chatsworth, T.T.I, Inc. 818-709-1010
CA Cypress, Bell Inds. 714-895-7801
CA Denver, T.T.I, Inc. 303-429-6806
CA Garden Grove, Bell Inds. 714-220-0681
CA Gardena, Bell Inds. 213-515-1800
CA Irvine, Acacia/VNR Elctrns. 213-971-2428
CA Irvine, Schweber Elctrns. 714-863-0254
CA Lakewood, Acacia/VNR Elctrns. 303-232-2882
CA Los Angeles, Bell Inds. 213-826-6778
CA Milpitas, T.T.I, Inc. 408-946-5577
CA Rocklin, Bell Inds. 916-652-0414
CA Sacramento, Schweber Elctrns. 916-929-9732
CA San Diego, Acacia/VNR Elctrns. 619-565-4365
CA San Diego, Neumann Elctrns. 619-695-3005
CA San Diego, Shelley-Ragon, Inc. 619-453-7133
CA San Diego, T.T.I, Inc. 619-587-4888
CA San Diego, Wyle Distbn. Grp. 619-565-9171
CA San Jose, Schweber Elctrns. 408-946-7171
CA San Jose, Shelley-Ragon, Inc. 408-432-0600
CA Santa Ana, T.T.I, Inc. 714-641-9393
CA Santa Clara, Wyle Distbn. Grp. 408-727-2500
CA Sunnyvale, Acacia/VNR Elctrns. 408-745-7200
CA Sunnyvale, Bell Inds. 408-734-8570
CA Thousand Oaks, Bell Inds. 805-499-6821
CA Wheat Ridge, Bell Inds. Inc. 303-424-1985
CO Denver, IEC 303-292-6121
CO Englewood, Shelley-Ragon, Inc. 303-762-0670
CT Danbury, Schweber Elctrns. 203-748-7080
CT Oxford, Schweber Elctrns. 203-264-4700
CT Wallingford, Almo Elctrns. Corp. 203-269-6801
CT Wallingford, Cronin Elctrns., Inc. 203-265-3134
CT Wallingford, T.T.I, Inc. 203-284-7474
FL Altamonte Springs, Schweber Elctrns. 305-331-7555
FL Ft. Lauderdale, Hammond Elctrns. 305-973-7103
FL Orlando, Hammond Elctrns. 305-849-6060
FL Orlando, T.T.I, Inc. 407-859-1000
FL Pompano Bch., Schweber Elctrns. 305-977-7511
FL Tampa, Shelley-Ragon, Inc. 813-623-6560
GA Norcross, Schweber Elctrns. 404-446-5842
GA Norcross, T.T.I, Inc. 404-662-0911
IL Elk Grove VL, Bell Inds., Inc. 312-640-1910
IL Elk Grove VL, Schweber Elctrns. 312-364-3750
IL Lombard, Shelley-Ragon, Inc. 312-629-8833
IN Ft. Wayne, Bell Inds., Inc. 219-423-3422
IN Indianapolis, Bell Inds., Inc. 317-875-8200
IA Cedar Rapids, Schweber Elctrns. 319-373-1417
KS Overland Pk., Schweber Elctrns. 913-492-2921
MD Columbia, T.T.I, Inc. 301-995-1331
MD Gaithersburg, M.S Elctrns. 301-921-0200
MD Gaithersburg, Schweber Elctrns. 301-840-5900
MD Jessup, Almo Elctrns. Corp. 301-953-2566
MD White Marsh, Resco/Baltimore, Inc. ... 301-529-0500
MA Bedford, Schweber Elctrns. 617-275-5100
MA Canton, Almo Elctrns., Inc. 617-821-1450
MA Needham, Cronin Elctrns., Inc. 617-449-5000
MA Wilmington, T.T.I, Inc. 508-658-4700
MA Woburn, Sterling Elctrns. 617-938-6200
MI Ann Arbor, Bell Inds., Inc. 313-971-9093
MI Livonia, Schweber Elctrns. 313-525-8100
MN Eden Prairie, T.T.I, Inc. 612-944-5080
MN Edina, Schweber Elctrns. 612-941-5280
MN St. Paul, Shelley-Ragon, Inc. 612-642-2828
MO Earth City, Schweber Elctrns. 314-739-0526
MO Independence, Shelley-Ragon, Inc. 816-254-3410
NJ East Brunswick, Almo Elctrns. Corp. .. 201-613-0200
NJ Fairfield, Schweber Elctrns. 201-227-7880
NJ Mt. Laurel, T.T.I, Inc. 609-234-6400
NJ Pinebrook, Schweber Elctrns. 201-227-7880
NM Albuquerque, Bell Inds., Inc. 505-292-2700
NY Bohemia, Justin Elctrns., Inc. 516-589-4000
NY Medford, LI, Shelley-Ragon, Inc. 516-447-2000
NY Rochester, Schweber Elctrns. 716-424-2222
NY Ronkonkoma, T.T.I, Inc. 516-737-2073
NY Valley Stream, LI, L & S Elctrns. 516-561-2474
NY Westbury, Schweber Elctrns. 516-334-7474
NC Greensboro, Hammond Elctrns. 919-275-6391
NC Raleigh, Resco/Raleigh 919-781-5700
NC Raleigh, Schweber Elctrns. 919-876-0000
OH Beachwood, Schweber Elctrns. 216-464-2970
OH Columbus, Hughes-Peters, Inc. 614-294-5351
OH Columbus, T.T.I, Inc. 614-848-5770
OH Dayton, Bell Inds., Inc. 513-434-8231
OH Dayton, Bell Inds., Inc. 513-435-8660
OH Dayton, Schweber Elctrns. 513-439-1800
OK Tulsa, Schweber Elctrns. 918-622-8000
OR Beaverton, Shelley-Ragon, Inc. 503-641-1691
OR Lake Osego, Bell Inds., Inc. 503-241-4115
PA Horsham, Schweber Elctrns. 215-441-0600
PA Mars, Almo Elctrns. Corp. 412-931-5990
PA McKean, Advacom, Inc. 814-476-7774
PA Philadelphia, Almo Elctrns. Corp. 215-698-4009
PA Pittsburgh, Schweber Elctrns. 412-782-1600
TX Austin, Schweber Elctrns. 512-339-0088
TX Dallas, Schweber Elctrns. 214-661-5010
TX Dallas, Shelley-Ragon, Inc. 214-349-2424
TX Ft. Worth, T.T.I, Inc. 817-595-3100
TX Ft. Worth, T.T.I, Inc. 817-831-8300
TX Houston, Schweber Elctrns. 713-784-3600
UT Midvale, Bell Inds., Inc. 801-255-9611
VA Charlottesville, Viginia Elec. Comps., Inc. 804-296-4184
WA Redmond, Bell Inds., Inc. 206-885-9963
WA Redmond, Shelley-Ragon, Inc. 206-883-2220
WA Redmond, T.T.I, Inc. 206-882-0291
WI Milwaukee, Marsh Elec. Inc. 414-475-6000
WI New Berlin, Schweber Elctrns. 414-784-9020
WI Waukesha, Bell Inds., Inc. 414-547-8879
Can Alberta, Future Elctrns. 403-235-5325
Can British Columbia, Future Elctrns. 604-438-5545
Can Ontario, Future Elctrns. 613-820-8313
Can Ontario, Future Elctrns. 416-638-4771
Can Quebec, Future Elctrns. 514-694-7710
OR Beaverton, Acacia/VNR Elctrns. 503-646-3377

BRADFORD ELCTRNS., INC., Special Resistor Div., PO Box 1179, Robbinsville, NC 28771-1179, Tel: 704-479-6451; Empl.: 140; *Sls. Mgr.:* Larry Viar

BRADY, W. H., CO., Indl. Prods. Div., 2221 W. Camden Rd., Milwaukee, WI 53201, Tel: 414-351-6630, TELEX: 26-677, TWX: 910-262-3151, FAX: 1-800-292-2229; *Sls. Mgr.:* M. O. Williamson; *Dist. Mgr.:* M. O. Williamson

BRADY, W.H., CO. NAMEPLATE DIV., See Brady, W.H., Co., Elctrn. Prods. Div

BRADY, W. H., CO., Xymox Div., 8225 W. Parkland Ct., P.O. Box 571, Milwaukee, WI 53201, Tel: 414-354-8300, TELEX: 26-677, TWX: 910-262-3151, FAX: 414-354-0453; FSC No.: 85480; *Sls. Mgr.:* F. P. Yorio

BRAEMAR CORP., 11400 Rupp Drive, Burnsville, MN 55337, Tel: 612-890-5135; Empl.: 130; *Sls. Mgr.:* Ron Zylstra

BRAILSFORD & CO., 670 Milton Rd., Rye, NY 10580, Tel: 914-967-1820, FAX: 914-967-1836; Empl.: 25

BRAND DIELECTRICS, INC., Route 203, N. Windham, CT 06256, Tel: 203-423-6321; Empl.: 5; *Sls. Mgr.:* Philip Harvey

BRANDEN, T. G., CORP., 15822 S.W. Upper Bns. Fry. Rd., Lake Oswego, OR 97035, Tel: 503-620-7571; Empl.: 8; *Sls. Mgr.:* Curt Norby

BRANDT ELECTRONICS, INC., 815 E. Middlefield Road, Mountain View, CA 94043, Tel: 415-967-4944, FAX: 415-967-9105; FSC No.: 57837; Empl.: 52; *Sls. Mgr.:* Frank D. Brandt

Local Sales Offices & Reps

AZ Phoenix, Tech Sls. Inc. 602-246-1614
CA Saratoga, E. Reid Miller 408-257-6927
CO Boulder, Herb Bass Assoc. 303-530-7509
FL Orlando, Honeyco 407-299-1000
GA Warner Robins, DeBona Consultant Assoc. 912-922-6560
IL Wauconda, Cudahy Sls. Co. 312-526-2484
MD Ellicott City, Nelson Elctrns, Inc. 301-747-7887
MA Chelmsford, B.B.C., Inc. 508-452-7211
MO St. Louis, AME Sls., Inc. 314-962-9771
NY East Syracuse, Emtech Assoc. 315-437-6410
NY Wantagh, BYTEC Rep. 516-781-7400
TX Richardson, Vector Sls. 214-234-4291
WA Everett, Huntley 206-337-5594

BRANMAG, INC., 908 Niagara Falls Blvd., North Tonawanda, NY 14120, Tel: 716-693-5994, FAX: 416-856-4802; FSC No.: 9V968; Empl.: 6; *Sls. Mgr.:* B. Veljkovic

BRAXTON MFG., Echo Lake Rd. N, P.O. Box 429, Watertown, CT 06795, Tel: 203-274-6781, TWX: 710-477-0621, FAX: 203-274-9195; Empl.: 115; *Sls. Mgr.:* Richard Rosa

BREEZE-ILLINOIS, TransTechnology Corp., 8800 Allen Rd., Peoria, IL 61615-1584, Tel: 309-693-3300, TWX: 510-390-3691, FAX: 303-693-3308; Empl.: 280; *Sls. Mgr.:* Stanley Profiri; *Dist. Mgr.:* Stanley Profiri

Brentek International

BRENTEK INTERNATIONAL, INC., 526 Windsor St, Reading, PA 19601, Tel: 215-375-7200; Empl.: **2**; *Sls. Mgr.:* Roberta Breneman

Local Sales Offices & Reps

IL Schaumburg, Martan, Inc. 312-303-5660
MA Burlington, Anacon Sls. 617-272-9080
MN Minneapolis, Scott Elctrns. 612-929-2985
NJ Hackensack, L-Tron Assocs. (East) ... 201-342-8033
NY Pittsford, L-Tron Assocs. 716-385-7520
PA Reading, Brentek Int'l, Inc. 215-375-7200
WI Grafton, Martan, Inc. 414-377-6640

Local Distributors

CA San Diego, Industrial Computer Source 800-523-2320
MN Minneapolis, Control Design Supply ... 612-721-1628
NY Glen Head, Livera-Polk Assocs. 516-759-9300
WI Germantown, Professional Control Corp. 414-251-3000
Can Mississauga,Ont., Transduction 800-268-0427

BREN-TRONICS, INC., 10 Brayton Ct., Commack, NY 11725, Tel: 516-499-5155, TELEX: 22-1213 TTCUR, FAX: 516-499-5504; FSC No.: 51828; Empl.: 75; *Sls. Mgr.:* Don Fagon

FAX: 201-778-2792

BRIM ELECTRONICS, P.O. Box 336 E, Fair Lawn, NJ 07410, Tel: 201-796-2886; FSC No.: 57834 ..... **C•1820-1829**

Local Sales Offices & Reps

AZ	Phoenix, Mactronix	602-998-1848
MA	Stow, GH Assocs.	617-897-1741
MA	Stow, R G Assocs.	617-897-7146
EXP	NY, N.Y.C., Roburn Agencies	212-989-5939

Local Distributors

AL	Dothan, Carmichael Whls. Supp.	205-793-7066
CA	Canoga Park, Tim-Co. Sls.	213-992-5040
CA	San Diego, Shanks & Wright	619-239-0176
CT	Manchester, IMS	203-649-4415
CT	Waterbury, Century Elec.	203-755-0405
FL	Lake Mary, Electronic Fasteners	305-321-4000
KS	Topeka, Acme Radio Supp. Co.	913-235-1363
LA	New Orleans, Radio Parts	504-581-5959
MA	Billerica, Eastern Video Sys.	617-667-0009
MA	Lexington, Wholesale Elect. Supp.	617-862-3590
MA	Springfield, Electro-Term	413-734-6469
MA	Waltham, Linear Elect.	617-894-7300
NH	Dover, American Radio Corp.	603-742-6800
NJ	Hackensack, Milcor	201-489-1313
NY	LIC, H.L. Dalis	212-361-1100
NY	N.Y.C., Center Indl.	212-YU9-6363
OK	Tulsa, Radio, Inc.	918-587-9123
RI	Newport, J & S Elctrn. Distb.	401-847-2977
TN	Knoxville, Bondurant Bros. Co.	615-573-9151
TX	Texarkana, Lavender Elec.	501-773-4631
TX	Texarkana, McCulloch Elctrns.	214-792-6923
VT	Cavendish, C S Svc. & Supp. Co.	802-226-7582
VA	Norfolk, Todd Elec.	804-855-3111
WA	Seattle, Amateur Radio Supp.	206-767-3222

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BRISTOL BABCOCK INC., 1100 Buckingham St., Watertown, CT 06795, Tel: 203-575-3000, 800-243-3576, TELEX: 962417, FAX: 203-754-1477; Empl.: 600; *Sls. Mgr.:* Carlos Batista

BROOKS ELECTRONICS, 4001 N. American St., Philadelphia, PA 19140, Tel: 215-228-4433, FAX: 215-227-7687; Empl.: 70; *Sls. Mgr.:* G. Brooks; *Dist. Mgr.:* G. Brooks

BROOKS INSTRUMENT DIV., Emerson Elec. Co., 407 W. Vine St., Hatfield, PA 19440, Tel: 215-362-3500, TELEX: 4975082, FAX: 215-362-3745; Empl.: 1500

BROOKS POWER SYSTEMS, 1810 Byberry Rd., Bensalem, PA 19020, Tel: 215-244-0264, 1-800-523-1551, FAX: 215-244-0160; Empl.: 90; *Sls. Mgr.:* Joan LaRocca

BRUEL & KJAER INSTRS. INC., 185 Forest St., Marlboro, MA 01752-3093, Tel: 508-481-7000, TWX: 710-347-1187, FAX: 508-485-0519; Empl.: 200

Local Sales Offices & Reps

CA	Foster City, Bruel & Kjaer Instrs.	415-574-8100
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GA	Marietta, Bruel & Kjar Instrs.	404-422-5200,
IL	Hoffman Estates, Bruel & Kjaer Instrs.	312-358-7582
MD	Gaithersburg, Bruel & Kjaer Instrs.	301-948-0494
MA	Marlborough, Bruel & Kjaer Instrs.	508-481-7737
MI	Livonia, Bruel & Kjaer Instrs.	313-522-8600
NJ	West Caldwell, Bruel & Kjaer Instrs.	201-227-6100
OH	Milford, Bruel & Kjaer Instruments	513-831-8878
TX	Irving, Bruel & Kjaer Instrs.	214-751-1700,
WA	Seattle, Bruel & Kjaer Instrs.	206-324-5905,

BRUNING COMPUTER GRAPHICS, P.O. Box 3020, 777 Arnold Dr., Martinez, CA 94553, Tel: 415-372-7568, TWX: 910-481-5951 ZETAPLOTS MART; FSC No.: 52893; Empl.: 200; *Sls. Mgr.:* Gary Hasenfus

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CA	Irvine, Vale Elctrns. Assocs.	714-551-4821
CA	Pasadena, P. Nurches Co.	213-681-8957
CA	Santa Clara, Engrg. Assocs.	408-988-5001
CO	Denver, Moss Mktg.	303-455-7205
FL	Indian Rock Bch., PAR Assocs., Inc.	813-596-8841
GA	Atlanta, Par Assoc.	404-391-9117
IL	Mt. Prospect, Robert Adams Sls.	312-297-8733
KS	De Soto, Midtec Assoc.	913-441-6565
MD	Columbia, Tyler Griffin Co.	301-995-1215
MA	Belmont, Elctrn. Comps. & Svc.	617-484-8680
MN	Minneapolis, A. J. Warner Co.	612-729-7371
MO	Florissant, Midtec Assocs., Inc.	314-837-5200
NJ	Ocean, P. Saftler Assocs.	201-922-3014
NM	Albuquerque, Moss Mktg.	505-292-7505
NY	Fulton, P. Saftler Assocs.	315-592-7184
NY	Lynbrook, P. Saftler Assoc.	516-593-7880
OH	Beechwood, Elctrn. Sls. Masters, Inc.	800-321-1848
OH	Columbus, McFadden Sls.	614-761-3177
OK	Tulsa, Advance Tech. Sls.	918-664-0482
OR	Forest Grove, Doran Sls. Assocs., Inc.	503-357-3333
PA	Paoli, T. Griffin Co.	215-647-1550
TX	Austin, Advance Tech. Sls.	512-440-7677
TX	Dallas, Advance Tech. Sls.	214-340-1300
TX	Houston, Advance Tech. Sls.	713-440-3888
WA	Redmond, Doran Sls. Assocs., Inc.	206-885-1885

Local Distributors

CA	Los Angeles, Elect. Switches	213-664-1141
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GA	Atlanta, Lakeland Engrg. Equip.	404-696-7334
MI	Ann Arbor, Wedemeyer Elctrns.	313-665-8611
MN	Albuquerque, Ideal Elctrn. Supp.	505-345-7887
NY	Hauppauge, Broadline Elctrn. Dist.	516-231-4100
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TX	El Paso, Ideal Indl. Elctrn.	915-779-6647
WA	Seattle, Radar Elec.	206-282-2511
WA	Spokane, Radar Elec.	509-747-3053

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BUEHLER PRODUCTS, INC., P. O. Box 33400, Raleigh, NC 27606, Tel: 919-469-8522, TWX: 510-924-2474; Empl.: 400; *Sls. Mgr.:* D. Frank Slightom

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BULBTRONICS, INC., 1260 N. Hancock St. Ste. 106, Anaheim, CA 92807, Tel: 714-693-0533, FAX: 714-693-0814

BULOVA WATCH CO., See Frequency Control Prods., Inc., American Time Prods. Div.

BUMPER PRODUCTS CORP., 14 King St., P.O. Box 45, Mt. Holly, NJ 08060, Tel: 609-261-8100, 800-541-2500, FAX: 609-261-7300; *Sls. Mgr.:* Ed Rosenthal

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CA	Tustin, Sierra Pacific Engrg.	714-731-3411
CO	Denver, Harthun Assoc.	303-792-5050
CT	W. Hartford, Peak Sls.	203-233-1693
FL	Casselberry, Southern Elec. Sls. Corp.	305-332-4718
FL	Melbourne, Southern Elec. Sls. Corp.	305-242-9661
GA	Atlanta, Murphy and Cota	404-875-2525
IL	Des Plaines, Lincoln, Hodges and Assocs.	312-297-3810
KS	Mission, Mertens Co.	913-432-9323
MA	Topsfield, Peak Sls.	508-887-3868
MI	Royal Oak, Hilltronics	313-398-5556
MN	St. Paul, Kencotronics	612-645-7717
MO	St. Louis, Mertens Co.	314-993-6600
NH	Manchester, Peak Sls.	603-647-0544
NJ	Palisades Park, A. P. Technical Sls.	201-461-8875
NY	Albany, Niagara Elec. Sls.	518-869-0130
NY	Buffalo, Niagara Elec. Sls.	716-825-3100
NY	East Syracuse, Niagara Elec. Sls.	315-437-1656
NY	Rochester, Niagara Elec. Sls.	716-271-1223
NC	Burlington, Murphy & Cota	919-584-6450
OH	Cincinnati, Anderson-Bolds, Inc.	513-528-5680
OH	Cleveland, Anderson-Bolds, Inc.	216-229-4700
OH	Worthington, Anderson-Bolds Inc.	614-885-3933
OR	Forest Grove, Doran Sls. Assocs.	503-357-3333
PA	Philadelphia, Kenneth B. Erdman, Co.	215-233-0172
WA	Redmond, Doran Sls. Assocs.	206-885-1885
WI	Janesville, Antek Mktg. Corp.	608-754-4214

Local Distributors

AL	Muscle Shoals, Jones Elctrns., Inc.	205-383-1241
CA	Anaheim, Control Design Supp.	714-821-1516
CA	Fresno, Control Elec.	209-268-4411
CA	Long Beach, Elctrl. Power & Controls	213-498-6699
FL	Miami, B & R Elctrns. Supp. Inc.	305-255-4510
FL	Miami, Electro-Standards Labs	305-593-6060
FL	Oakland Pk., Zelcon Inc.	305-565-2555
IL	Chicago Heights, Helsel-Jepperson	312-756-5600
IL	Harvey, George Elctrns.	312-331-1983
MA	Fall River, Broadway Elec. Sls.	617-673-3339
MA	Holyoke, Falcetti & Clark Elec.	413-532-9402
MA	Medford, Empire Elec.	617-395-5000
MA	Springfield, Yankee Elec.	413-739-2101
MI	Grand Rapids, S & F Elctrns. Supp.	616-459-0216
MI	St. Clair Shores, Spemco	313-771-2700
MN	Minneapolis, Elctrn. Center Inc.	612-371-5200
NE	Lincoln, Scott Elec. Supp.	402-446-8221
NH	Manchester, Cohen Machinery Co. Inc.	603-624-4324
NJ	Oakland, Relay Specialties	201-337-1000
NY	Gloversville, Montano Elctrl. Supp.	518-725-3139
NY	Roosevelt, Automated Equip. Co.	516-538-7417
NY	Woodside, Switches Unlimited	718-478-5000
NC	Durham, Triangle Elec. Motor	919-596-1333
NC	Gastonia, JMT Elctrns. & Control	704-867-4401
OH	Cincinnati, Richards Elec. Supp.	513-242-8800
PA	Harrisburg, Cumberland Elctrns.	717-232-9715
PA	Philadelphia, Esco Elctrl. Supp.	215-923-6050
RI	Providence, J & H Elec. Co., Inc.	401-421-7840
SC	Greenville, Sawyer Elctrns. Corp.	803-235-0438
TX	San Antonio, Sherman Elec. Supp. Inc.	512-224-1004
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BURLING INSTRUMENTS, P.O. Box 298, Chatham, NJ 07928, Tel: 201-635-9481, FAX: 201-635-9530; Empl.: 29; *Sls. Mgr.:* Roger Nation

BURNDY CORPORATION, Richards Ave., Norwalk, CT 06852, Tel: 203-838-4444, FAX: 203-852-6228/6227; Empl.: 3500; *Sls. Mgr.:* Stan Suszek

BURR-BROWN CORP., P.O. Box 11400, Tucson, AZ 85734, Tel: 602-746-1111, TELEX: 66-6491, TWX: 910-952-1111, FAX: 602-741-4395; Empl.: 1500; *Sls. Mgr.:* M. Dickey/B. McGrath/J. Stoupa

BURTON ELECTRICAL ENGINEERING, Wyle Laboratories, 111 Maryland Street, P.O. Box 217, El Segundo, CA 90245-0217, Tel: 213-772-1406, TELEX: 858485, TWX: 910-348-6699, FAX: 213-322-3603; FSC No.: 81861; Empl.: 55; *Sls. Mgr.:* Nasir Shah

BUSINESS TIMEKEEPING SYSTEMS, INC., 170 Navajo St., San Marcos, CA 92069-2593, Tel: 619-744-3044; Empl.: 12; *Sls. Mgr.:* William W. Stephenson; *Dist. Mgr.:* William W. Stephenson

BUSSCO INC., 119 Standard St., El Segundo, CA 90245, Tel: 213-322-6580, TWX: 910-348-6295, FAX: 213-322-8130; FSC No.: 29593; Empl.: 55

BUSSMANN:COOPER INDUSTRIES, P.O. Box 14460, St. Louis, MO 63178, Tel: 314-394-2877, TELEX: 44 841; FSC No.: ;Multiple; Empl.: 3000; *Sls. Mgr.:* John Monter; *Dist. Mgr.:* John Monter ..... **C•1295**

BYTEK CORP., Instrument Systems Div., 508 N.W. 77th St., Boca Raton, FL 33487-1323, Tel: 407-994-3520, TELEX: 4998369 BYTEK, FAX: 407-994-3615; Empl.: 45; *Sls. Mgr.:* Madeline Selwitz

BYTEX CORP., 120 Turnpike Rd., Southborough, MA 01772, Tel: 617-480-0840, TELEX: 951151; Empl.: 230; *Sls. Mgr.:* Jeffrey Goodman

CABLESCAN, INC., Subsidiary of Eubanks Engrg. Co., 145 E. Emerson Ave., Orange, CA 92665, Tel: 714-998-1961, TELEX: 291693; *Sls. Mgr.:* Jerry Stephens

CABLE SYSTEMS, INC., 210 Broadway, Everett, MA 02149, Tel: 617-389-7080, FAX: 617-389-4758; FSC No.: 33426; Empl.: 70; *Sls. Mgr.:* Darrell Fernald

CABLETEST PRODUCTS CO., 81 W. Wyoming Ave., Melrose, MA 02176, Tel: 617-665-2932; Empl.: 28; *Sls. Mgr.:* H. E. Holley; *Dist. Mgr.:* H. E. Holley

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CABTRON SYSTEMS, INC., 200 N. Anets Dr., Northbrook, IL 60062, Tel: 312-498-6090; Empl.: 45; *Sls. Mgr.:* Mike Gober ..... **C•1014**

Local Sales Offices & Reps

AZ	Tempe, Sierra Tech. Grp.	602-894-2335
CA	Hayward, Larsen Assocs.	415-785-1473
CA	Orange, XBX Sls., Inc.	714-998-8200
CA	San Diego, XBX Sls., Inc.	619-586-1577
CO	Englewood, Sierra Tech. Grp.	303-790-1700
CT	Cheshire, Meco, Inc.	800-225-3409
FL	Orlando, D.A.I.	407-299-7754
GA	Lilburn, Phillip Matthews Corp.	404-381-1662,
IN	Indianapolis, Liberty Sls.	317-888-8396
KS	Wichita, Buckman & Assocs.	316-267-2052
MD	Silver Spring, Ansell Engrg.	301-949-1655
MA	Reading, Meco, Inc.	617-944-6660,800-225-3409
MI	Livonia, Lowell-Wendt	313-464-2722
MN	St. Paul, Countryman Assocs.	612-645-9151
MO	St. Charles, Buckman & Assocs.	314-947-4727
NJ	Mt. Lakes, N.J. Comps. for Elctrns.	201-334-2921
NM	Organ, Sierra Tech. Grp.	505-382-5542
NC	Kings, Phillip Matthews Corp.	919-983-9790,
OH	Dayton, Geotronix	513-854-5939
OH	Richfield, Geotronix	216-659-6100
OR	Portland, McLaren, Inc.	503-297-2248
PA	Allison Pk., Geotronix	412-487-1770
PA	Blue Bell, Comp. for Elctrns.	215-825-3939
TX	Dallas, Dunbar Assocs.	214-239-7151
UT	Holladay, Sierra Tech. Grp.	801-272-3733
WA	Bellevue, McLaren	206-454-3400

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AL	Huntsville, Beacon Elctrns.	205-881-5031
AZ	Scottsdale, Arcom Sls.	602-947-5745
CA	Irvine, Groh Assocs.	714-837-9871
CA	Redwood City, James S. Heaton Co.	415-367-9000
CA	San Diego, Groh Assocs.	619-453-7572
CA	Valencia, Groh Assocs.	805-259-0261
CO	Boulder, Front Range Mktg.	303-443-4780
FL	Longwood, D-Assocs.	407-830-8976
GA	Atlanta, Beacon Elctrns.	404-256-9640
IA	Cedar Rapids, Dy-Tronix	319-377-8275
KS	Wichita, Dy-Tronix Inc.	316-838-0884
MN	Minnetonka, Gibb Elctrn. Sls.	612-935-4600
MO	Raytown, Dy-Tronix	913-229-6333
MO	St. Louis, Dy-Tronix	314-291-4777
NH	Amherst, D. A. Crowley & Assocs., Inc.	603-673-7050
NJ	Madison, Livera Polk Assoc., Inc.	201-377-3220
NJ	Pitman, Colrud Corp.	609-589-5866
NY	Glen Head, Livera Polk Assoc., Inc.	516-759-9300
NC	Raleigh, Beacon Elctrns.	919-787-0330
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OR	Beaverton, Elctm. Sources	503-627-0838
WA	Bellevue, Elctm. Sources	206-451-3500

Local Distributors

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CAD ENGRG. & ASSEMBLY INC., 8663 Tyler Blvd., Mentor, OH 44060, Tel: 216-255-7744, FAX: 216-255-5900; Empl.: 28

CADILLAC PLASTIC & CHEM. CO. DIV. OF M.A. HANNA, 143 Indusco Ct., Troy, MI 48083, Tel: 313-583-1200, TWX: 810-232-1886, FAX: 313-583-4715; Empl.: 1000

CAIG LABS., 1175-0 Industrial Ave., Escondido, CA 92025, Tel: 619-743-7143, FAX: 619-743-2460; Empl.: 15

CALABRO INDS., INC., See UNITRACK Div., Calabro Inds., Inc.

CAL-AV, INC., 515B Westchester Drive, Campbell, CA 95008, Tel: 408-371-0666; Empl.: 8

CALAY SYSTEMS, INC., 16842 Von Karman Ave., No. 100, Irvine, CA 92714, Tel: 714-863-1700, TELEX: 6711321, FAX: 714-863-0310; Empl.: 70

CAL CRYSTAL LAB., INC., 1142 N. Gilbert, Anaheim, CA 92801, Tel: 714-991-1580, 800-333-9825, FAX: 714-491-9825; Empl.: 27; *Sls. Mgr.:* Herb Plumhoff

CALEX MFG. CO., INC., 3355 Vincent Rd., Pleasant Hill, CA 94523, Tel: 415-932-3911, TELEX: 269888, FAX: 415-932-6017; FSC No.: 29988; Empl.: 75; *Sls. Mgr.:* Steve Corbett ..... **D•1006-1008, 1664-1668**

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CA	Mtn. View, Saber Entprs., Inc.	415-368-0427
CA	San Diego, Saber Entprs., Inc.	619-271-1523
CA	San Jose, AMASCO	408-262-1897
CA	Torrance, AMASCO	213-781-9494
CT	Tolland, R.G. Assocs.	203-875-4201
IL	O'Fallon, J & J Entprs.	618-632-8221
MA	Lowell, R.G. Assocs.	617-458-9802
MA	Marshfield, R.G. Assocs.	617-837-3290
NJ	Marlton, Analectro Tech. Rep., Inc.	201-396-8310
NJ	Scotch Plains, Annlectro Tech. Rep., Inc.	201-396-8310
NC	Raleigh, Geotronix	216-659-6100
OH	Trottwood, Geotronix	513-253-6700
OK	Tulsa, Spectra Sls. Corp.	918-665-8899
OR	Portland, Topp Engrg.	503-244-7265
PA	Allison Pk., Geotronix	412-487-1770
TX	Houston, Chauvin Engrg. Co.	713-668-4770
TX	Houston, Spectra Sls. Corp.	713-270-8212
TX	Richardson, Spectra Sls. Corp.	214-234-3600
VA	Alexandria, Analectro Tech. Rep., Inc.	703-922-4317
WA	Bellevue, Topp Engrg. Sls. Co.	206-747-5400

Local Distributors

OH	Richfield, Alpha Distr.	216-659-7100

CALIBRON INSTRUMENTS, Burton-Rogers Co., 220 Grove St., Waltham, MA 02154, Tel: 617-894-6440, FAX: 617-893-8393; Empl.: 14; *Dist. Mgr.:* W. Burton

CALIFORNIA AUTOMATION INC., 11815 Sorrento Valley Rd., San Diego, CA 92121, Tel: 619-452-1341

CALIFORNIA AVIONICS LABS., See Cal-Av, Inc.

CALIFORNIA DC

FAX: 805-498-8381

CALIFORNIA DC, 2150 Anchor Ct., Newbury Park, CA 91320, Tel: 805-499-3621; Empl.: 100; *Sls. Mgr.:* C. Paton; *Dist. Mgr.:* C. Paton ..... **D•1670-1673**

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IL	Arlington Hgts., Coombs & Assocs.	312-439-9810
MA	Wellesley Hills, Sturdy Corp.	617-235-2330
NY	Hicksville, L-Tronix	516-935-0220
TX	Houston, Prime Tech. Sls.	713-894-4161

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NY	Hicksville, L-Tronix	516-935-0220
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Can	Montreal, Que., Future Elctrns.	514-694-7710
Can	Ontario, RD Assocs.	416-444-0959

CALIFORNIA EASTERN LABS. INC., 3260 Jay St., Santa Clara, CA 95054, Tel: 408-988-3500, TELEX: 346393, TWX: 171197; Empl.: 100

California INSTRUMENTS

FAX: 619-279-8139

CALIFORNIA INSTRUMENTS, Amstar Electronics Group, 5125 Convoy St., Ste. 201, San Diego, CA 92111, Tel: 619-279-8620, 800-356-2244, 800-821-1634, TELEX: 695047 CALICO SDG; FSC No.: 16067; Empl.: 95; *Sls. Mgr.:* W.E. Bradbury ..... **D•2178-2181**

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CO	Denver, Aztec Entprs.	303-779-5285
CT	Mt. Carmel, Sci. Dvcs.-NE	203-248-9361
FL	Melbourne, Saber Assocs.	305-724-0920
IL	Chicago, EIA, Inc.	312-298-2290
IN	Indianapolis, EIA, Inc.	317-257-7231
KS	Overland Park, Ramsey Assocs.	913-541-1007
LA	Metairie, Data Mktg. Assocs.	504-833-3655
MD	Rockville, Creative Mktg. Assocs.	301-251-4100
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MI	Warren, Deitrich & Assoc.	313-751-4990
MN	Minnetonka, E.I.A., Inc.	612-933-7793
MO	St. Louis, Ramsey Assocs.	314-532-9386
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NM	Albuquerque, Aztec Entprs.	505-262-1688
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NY	Whitney Pt., TAE-Rep, Inc.	607-692-3705
OH	Cincinnati, Dietrich & Assoc.	513-984-8924
OK	Tulsa, Data Mktg. Assocs.	918-494-2711
OR	Beaverton, Northwest T&M	503-645-9000
PA	Horsham, Sci. Dvcs. East	215-956-0700
PA	Pittsburgh, Dietrich & Assoc.	412-892-2992
TX	Austin, Data Mktg. Assocs.	512-338-4701
TX	Dallas, Data Mktg. Assocs.	214-661-0300
TX	Houston, Data Mktg. Assocs.	713-954-5020
TX	San Antonio, Data Mktg. Assocs.	512-342-3031
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WA	Redmond, N.W. Test & Measurement	206-881-8857
Can	N. Vancouver, B.C., Jerome & Francis Co., Ltd.	604-986-1286
Can	Ottowa, Ont., A.I.M.	613-722-8286

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CA	San Diego, El Dorado Sls.	619-549-2202
FL	Seminole, Q-Rep	813-393-6393
IL	Itasca, Janus, Inc.	312-250-9650
IN	Kokomo, Schillinger Assoc.	317-455-2708
MI	Southfield, Ted Peterson & Assoc.	313-350-1040
MN	Minneapolis, Internation Elec.	612-571-0000
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NY	Jericho, J-Square Mktg.	516-935-3200
NY	Penifield, Upstate Comps.	716-381-6070
NC	Raleigh, KZJ Comp.	919-782-8100
OH	Cleveland, Arthur H. Baier	216-461-6161
OH	Cleveland, Arthus H. Baier	212-461-6161
OH	Dayton, Arthur H. Baier	513-276-4128
PA	Sellersville, Tech-Com Mktg.	215-453-0711
TX	Dallas, Merino Sls.	214-233-6002
VA	Baltimore, Conroy Sales	301-296-2444
Can	Ontario, Cantech Rep.	613-725-3704

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MA	W. Peabody, Massachusetts Comps. Inc. (MCI)	617-535-7270
NJ	Fairfield, C.H.P.S.	201-882-0997

CALIFORNIA MICROWAVE, 990 Almanor Ave., Sunnyvale, CA 94086, Tel: 408-732-4000, TELEX: 35 2016, TWX: 910-339-9231, FAX: 408-732-4244; Empl.: 780

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FAX: 818-287-7350

CALMARK CORP., 4915 Walnut Grove Ave., San Gabriel, CA 91776, Tel: 818-287-0451, TWX: 910-589-1540; FSC No.: 52094; Empl.: 80; *Sls. Mgr.:* Bruce Rockwell; *Dist. Mgr.:* Bruce Rockwell ..... **C•1015**

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CA	San Jose, Calmark Corp.	408-434-1615
CO	Lakewood, Cristee-Meade	803-232-0287
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TX	Richardson, Zonk Assocs.	214-238-7651
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CO	Englewood, Cypress Elec.	303-792-5829
FL	Largo, Lo-Dan	813-586-2851
FL	Longwood, Intertec Comps.	305-834-7777
IL	Elk Grove, Martec Assocs.	312-956-8090
MD	Beltsville, Petricko, Inc.	301-937-4960
MA	Haverhill, Cord	617-374-0100
MN	Minneapolis, Aero-Space Computer Supp.	612-884-4725
NJ	Corbin City, Index	609-628-4040
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NY	Endwell, Pryme-Line Distrs.	607-748-5200
OH	Miamisburg, E.C.I. Distrs.	513-866-3340
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TX	El Paso, International Elex.	915-598-3406
TX	Richardson, Zec Sls.	214-669-0895

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Can Mississauga, Ont., Rush Elex. Ltd. 416-677-7280

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FL Boca Raton, Beacon Elctrns. 305-997-5740
FL Clearwater, Beacon Elctrns. 813-796-2378
FL Longwood, Beacon Elctrns. 305-332-1940
GA Atlanta, Beacon Elctrns. 404-256-9640
IL Elk Grove Vlg., Control Sls. 312-595-2110
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IN Ft. Wayne, Technlg. Mktg. Corp. 219-432-5553
IA Cedar Rapids, Dy-Tronix, Inc. 319-377-8275
KS Leawood, Dy-Tronix, Inc. 913-339-6333
KS Wichita, Dy-Tronix, Inc. 316-838-0884
KY Louisville, Technlg. Mktg. Corp. 502-893-1377
MD Randallstown, Beacon North, Inc. 703-478-2480
MA Waltham, Gerber Sls. Corp. 617-890-3334
MI Grand Rapids, Rathsburg Assoc. 616-949-7400
MI Southfield, Rathsburg Assoc. 313-559-9700
MN Minnetonka, Gibb Elctrns. 612-935-4600
MO Bridgeton, Dy-Tronix,Inc. 314-291-4777
NJ Cherry Hill, Quality Comps. 609-428-6266
NM Albuquerque, Reptronix 505-292-1718
NY Latham, L-Tron Corp. 518-785-5032
NY Pittsford, L-Tron Corp. 716-383-0050
NY Port Washington, Ashtec, Inc. 516-767-0336
NC Raleigh, Beacon Elctrns. 919-787-0330
OH Beachwood, Thompson & Assocs. 216-831-6277
OH Dayton, Thompson & Assocs. 513-435-7733
OH Orient, Thompson & Assocs. 614-272-2086
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PA Wayne, Quality Comps. 215-687-3553
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VA Sterling Park, Beacon North 703-478-2480
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CANON U.S.A., Elctrn. Comps. Div., One Canon Plaza, Lake Success, NY 11042, Tel: 516-488-6700, TELEX: 96-1333; Empl.: 500; *Sls. Mgr.:* P. Specter ..... **B•1237, 1937-1938**

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GA Atlanta, CSR Elctrns. 404-396-3720
IL Schiller Pk., Wm. Bolles Assocs. 312-678-7888
IN Indianapolis, D-M Assoc. 317-842-4424
KS Mission, Mertens Co. 913-432-9323
MD Gaithersburg, Naudain Assocs. 301-258-5040
MA Hopkinton, Berkshire Elctrns. 617-435-9356
MI Lathrup Village, R. C. Nordstrom & Co. 313-559-7373
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Can Markham, Ont., Deskin Sls. 416-475-1412

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AL Montgomery, Southern Controls 205-277-5030
AZ Tempe, L-Comp, Inc. 602-730-1633
AR Little Rock, Carlton Bates 501-562-9100
CA Buena Park, Cypress Elctrns. 213-744-0355
CA Gardenia, Cal Switch 213-770-2330
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CA San Diego, Cypress Elctrns. 619-535-0011
CA Santa Clara, Cypress Elctrns. 408-980-2500
CA Van Nuys, Wes-Garde Comps. 213-873-4802
CO Englewood, Industrial Elctrns. 303-649-9444
CO Wheat Ridge, Cypress Elctrns. 303-431-2622
CT Hartford, Wes-Garde Comps. 203-527-7705
CT Wallingford, Sager Elec. Supp. 203-265-4600
FL Lakeland, Wes-Garde Comps. 813-644-7564
IL Carol Stream, Wes-Garde Comps. 312-653-1460
IL Wheeling, Hawk Elctrns. 312-459-4030
IN Indianapolis, Mar Elctrns., Inc. 317-633-6699
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KS Wichita, RSC Elctrns. 316-267-5213
MD Jessup, Treeko Sls., Inc. 1-800-638-0582
MD Rockville, FIC Corp. 301-881-8124
MA Hingham, Sager Elec. Supp. 617-749-6700
MI St. Clair Shores, Spemco 313-771-2700
MN Minneapolis, Bergquist Co. 612-835-2322
MN Minneapolis, Stark Elctrns. 612-332-1325
MO Kansas City, Walters Ind. Elec. 816-531-7015
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NH Nashua, Wes-Garde Comp. 603-880-1971
NH Salem, Sager Elec. Supp. 603-898-1348
NJ Mt. Laurel, Wes-Garde Comps. 609-778-8190
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NY Happauge, Sager Elec. Supp. 516-348-1300
NY Rochester, Simcona Elctrns. Corp. 716-328-3230
NY Woodside, Switches Unltd. 718-478-5000
NC Raleigh, Sager Elec. Supp. 919-850-9550
OH Cleveland, Repco Elctrns. 216-248-8900
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OK Oklahoma City, RSC Elctrns. 405-631-7729
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OR Beaverton, Cypress Elctrns. 503-641-2233
PA McKean, Advacom, Inc. 814-476-7774
SC Columbia, Dixie Elctrns. 803-779-5332
TN Nashville, Electra Distrbg. Co. 615-256-0800
TX Dallas, Cypress Elctrns. 214-869-1435
TX Dallas, Wes-Garde Comps. 214-357-1768
TX Stafford, Southwest Elctrns. 713-240-4000
WA Bothell, Cypress Elctrns. 206-483-1144
WA Kent, Component Resources 206-454-8666
WI Cedarburg, A.A. Elec. 414-377-8000
WI Waukesha, Hawk Elctrns. 414-547-4457

CAROL CABLE CO. INC., 249 Roosevelt Ave., Pawtucket, RI 02862, Tel: 401-724-9605, TELEX: 927-750, FAX: 401-724-3446; FSC No.: 53909; Empl.: 300

CAROLINA STEEL & WIRE, P.O. Box 829, Lexington, SC 29072-0829, Tel: 803-359-5501, TELEX: 573355, FAX: 803-359-1201; FSC No.: 72954; Empl.: 125

CARPENTER TECHNOLOGY CORP., P.O. Box 14662, Reading, PA 19612, Tel: 215-371-2000, TELEX: 836-432; Empl.: 4000; *Sls. Mgr.:* R. J. Weiler

CARROLL TOUCH, INC., P.O. Box 1309, Round Rock, TX 78680, Tel: 512-244-3500, TELEX: 881906, FAX: 512-244-7040; Empl.: 156; *Sls. Mgr.:* Terry Smith/Al Davis

Carrot Components Corporation

FAX: 805-987-5062

CARROT COMPONENTS CORPORATION, 750 West Ventura Blvd., Camarillo, CA 93010, Tel: 805-484-0540, TELEX: 18 1095, TWX: 910-336-1237; Empl.: 9; *Sls. Mgr.:* Kenneth E. Rhines; *Dist. Mgr.:* Kenneth E. Rhines ..... **C•1297-1299**

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AZ Phoenix, Allegro Assocs. 602-967-1337
CA Los Altos, Nickerson-Gray 415-941-5777
CA Santa Ana, Tri-Four Tech. 714-261-6738
CO Englewood, Romulus Elex, Inc. 303-770-4988
FL Satelite Bch., JLS Assocs. 305-773-7531
GA Alpharetta, JLS Assocs. 404-751-9012
IL Bensenville, Heighway Tech. Sls. 312-860-7900
IN Carmel, Current Elex. Mktg. 317-575-9943
MD Gaithersburg, Carwithen Assocs., Inc. 301-921-9545
MI Troy, C. B. Jensen & Assocs. 313-643-0506
MN Minneapolis, Microelectronic Sls. 612-829-0948
MO Kansas City, T.R. Assocs. 816-741-5885
NE Omaha, T.R. Assocs. 402-572-7785
NJ New Brunswick, Synergy Sls. 201-828-5090
NY Dryden, Sturges Elctrn. Inc. 607-844-8604
NC Raleigh, JLS Assocs. ... 919-846-7445,919-848-0750
OH Dayton, Shamrock Elex. Sls. 513-258-1727
OR Beaverton, N.R. Schultz Co. 503-643-1644
PA Prospect Pk., Elf Sls. 215-534-3340
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TX Dallas, D.J. Sls. 214-783-8876,214-783-7319
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AZ Scottsdale, Horizon Comps., Inc. 602-483-1112
CA Anaheim, Tary Elctrns. 714-630-2464
CA Costa Mesa, P.K.C. 714-556-7007
CA Granada Hills, Acort Inds. 818-700-2991
CA Industry, Ital Elctrns. 818-968-8515
CA Irvine, Kelex Elctrns. 714-863-1230
CA Manhattan Beach, Prime Electro Prods. Co. 213-379-3642
CA San Carlos, Logan Elctrns. 415-594-0700
CA Santa Ana, Vision Elctrns. 714-261-6777
CA Santa Clara, Rancor/RCI 408-986-8990
CA Sunnyvale, PSC, Inc. 408-773-1333
CO Denver, Component Dist., Inc. 303-799-4916
CT Bridgeport, Park Dists. 203-366-7200
CT Wallingford, Midstate Elctrns. 203-265-9900
FL Clearwater, Component Dist., Inc. 813-796-0466
FL Longwood, Intertec Comps. Inc. 305-834-7777
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HI Honolulu, Integrated Circuit Supp. 808-839-1966
IL Addison, Belford Elctrns. 800-323-1231
IL Lisle, Components, Inc. 312-852-7707
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MA Marlborough, Hardware Specialty Co. 617-481-8622
MA N. Adams, Shine Elctrns. 413-664-9933
MA Newton, In-Stock Prods. 617-870-5750
MI Livonia, LWC Dists. 313-464-7700
MN Eden Prairie, Custom Computer Cable 612-941-5651
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NH Hudson, Interconnect of N.E. 603-883-1515
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NH Nashua, Brevan Elctrns. 603-889-7230
OR Woodburn, Contech 503-981-3807
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RI Warwick, ARC Elctrns. 401-732-4038
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TX Dallas, EDC 214-257-0322

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CARTER MANUFACTURING CORPORATION, 237 Sugar Road, Bolton, MA 01740, Tel: 508-779-5501, FAX: 508-779-6166; FSC No.: 03929; Empl.: 30; *Sls. Mgr.:* Leo T. Nichols, VP Sls.

CARTER MOTOR, 400 Stagecoach Trail, Warren, IL 61087-0647, Tel: 815-745-2100, FAX: 815-745-2135; *Sls. Mgr.:* John W. Smith III

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CA Santa Barbara, Power Partners 800-468-5400
FL Brandon, R.C.Simon & Co. 813-689-6524
FL Lighthouse Point, R. C. Simon & Co. .. 305-941-2757
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IL Palatine, T-Squared Assocs. 312-991-2144
KS Overland Pk., Electri-Rep 913-649-2168
MA Burlington, Anacon Sls. Assocs., Inc. .. 617-272-9080
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MN Minneapolis, Hei-Lite Sls. 612-861-6051
MO St. Louis, Electri-Rep 314-993-4421
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OH Medina, J. C. Hofstetter Co. 216-241-4880
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NC Raleigh, Montgomery Mktg. 919-851-0010
VA Richmond, Glasscock Assocs. 804-740-0063
WI Milwaukee, Key Entprs., Inc. 414-453-9462

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MD Savage, Pyttronic 301-792-0780

CATEL TELECOMMUNICATIONS, 4050 Technology Pl., Fremont, CA 94537, Tel: 415-659-8988, TWX: 910-338-2263; Empl.: 150

CATON

FAX: 617-585-2973

CATON CONNECTOR CORP., Jones River Indl. Pk., 20 Wapping Rd., Kingston, MA 02364, Tel: 617-585-4315; FSC No.: 52196; Empl.: 28; *Sls. Mgr.:* D. Galambos ..... **C•1300-1304**

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CA Tarzana, High Voltage Sls. 818-881-9194
FL Altamonte Springs, Krebs Myton & Assoc. 305-788-9333
IL Carol Stream, Chemistry, Ltd. 312-690-1736
MA Tewksbury, Sequal Assocs. 617-851-4010
NM Albuquerque, Westfahl & Assocs. 505-881-0995
NY Glen Head, Livera Polk 516-759-9300
OH Cincinnati, Delta Sales 513-271-5444
OR Portland, SPS Elctrns. 503-297-6919
PA Trevose, PSA, Inc. 215-245-0513
TX Plano, Zeus Engrg. 214-423-2027
WA Redmond, SPS ELctrns. 206-323-4140
Can Thornhill, Ont., RFQ, Ltd. 416-881-1976

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FAX: 213-828-0846

CBM AMERICA CORP., 2020 Santa Monica Blvd. Ste. 410, Santa Monica, CA 90404, Tel: 213-828-8245, TELEX: 182508; Empl.: 20; *Dist. Mgr.:* Robin Pierce ..... **D•1082-1083**

Local Distributors

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IL Chicago, Micro Business Elec. 312-539-2994
NY Hewlett, Metropolitan Sls. 516-599-7900
OH Centerville, IPD 513-433-2800
TX Dallas, R Squared Elctrns. 214-406-1117
Can Toronto, Ont., TLS 416-479-1911

CCD IMAGING, Fairchild Weston Systems, Inc., 1801 McCarthy Blvd., Milpitas, CA 95035, Tel: 408-433-2500; *Sls. Mgr.:* Jim Johnson

C-COR ELCTRNS., 60 Decibel Rd., State College, PA 16801, Tel: 814-238-2461, TWX: 510-670-3513; FSC No.: 12775; Empl.: 650; *Sls. Mgr.:* J. Hastings

CDRL DATA, INC., 21642 North 9th Ave., Suite 103, Phoenix, AZ 85027-2823, Tel: 602-582-8844, FAX: 602-582-2199; FSC No.: 56060; Empl.: 25; *Sls. Mgr.:* James J. Edwards

CDS - COLORADO DATA SYS., 3301 W. Hampden, Unit C, Englewood, CO 80110, Tel: 303-762-1640, 800-CDS-ATE1, TWX: 910-933-0193, FAX: 303-781-0253; Empl.: 80; *Sls. Mgr.:* Bob Frodoe

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CEC, 330 W. Taft Ave., Orange, CA 92665, Tel: 714-637-2970; Empl.: 50

CEC INSTRUMENTS, Imo Industries Inc., 955 Overland Ct., San Dimas, CA 91773, Tel: 714-394-4481, TELEX: 200445 RCA, FAX: 818-351-0557; Empl.: 200; *Sls. Mgr.:* Lon Acheson

CELCO, 70 Constantine Dr., Mahwah, NJ 07430, Tel: 201-327-1123, TWX: 710-988-1018; FSC No.: 05954; Empl.: 25; *Sls. Mgr.:* P. S. Christaldi

CELESCO TRANSDUCER PRODS., INC., 7800 Deering Ave., Canoga Pk., CA 91304-5005, Tel: 818-884-6860, TELEX: 499-8137; *Sls. Mgr.:* Bart Gudmundson

CELESTION INDUSTRIES, INC., 89 Doug Brown Way, Holliston, MA 01746, Tel: 508-429-6706, TELEX: 948417, FAX: 508-429-2426; *Sls. Mgr.:* Barry Fox

CELL-CON INCORPORATED

FAX: 215-363-8719

CELL-CON, INC., 305 Commerce Dr., Exton, PA 19341, Tel: 215-363-8552; Empl.: 14; *Sls. Mgr.:* Gene Kiley ..... **D•1473**

CENTECH CORPORATION, 200 W. 88th St., Minneapolis, MN 55420, Tel: 612-881-8245, TWX: 431-0015-L8M, FAX: 612-881-4137; *Sls. Mgr.:* Norton G. Saude

CENTENT CO., 3879 S. Main St., Santa Ana, CA 92707, Tel: 714-979-6491; Empl.: 12; *Sls. Mgr.:* A. Freimanis

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CENTRONIC, INC., Morgan Crucible Co., Electronics Div., 1829 B DeHavilland Dr., Dept. E , Newbury Park, CA 91320-1702, Tel: 805-499-5902, FAX: 805-499-7770; FSC No.: 63334; Empl.: 20; *Sls. Mgr.:* George Pankau; *Dist. Mgr.:* Lou McCall

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CERAMASEAL, Box 260, New Lebanon, NY 12125, Tel: 518-794-7800, TELEX: 14-5442, FAX: 518-794-8080; FSC No.: 07601; Empl.: 89; *Sls. Mgr.:* Gene D. Sawin

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CO	Golden, J. F. Hurlbut Co.	303-279-7796
FL	Orlando, Physimetrics	407-894-8081
GA	Atlanta, Physimetrics	404-955-0155
IL	Downers Grove, Physics Equip.	312-810-9414
IL	Mt. Prospect, Automation Equip. Co.	312-398-7550
KS	Lenexa, Midtec Assocs.	913-541-0505
MD	Baltimore, R. A. Wafer Assoc.	301-744-1133
MA	Boston, P-J Engrg. Sls.	617-783-0510
MO	St. Louis, Midtec Assocs.	314-275-8666
NJ	Piscataway, Eastern Metro Assocs.	201-752-9292
NY	Farmington, R.M. Scanlon Assoc.	716-924-7450
NY	Plainview, Eastern Metro Assocs.	516-931-1414
NY	Syracuse, R.M. Scanlon Assoc.	315-437-1271
NY	W. Hempstead, Eastern Metro Assocs.	516-292-1131
NC	Charlotte, JWL Assoc.	704-541-5750
PA	Clairton, Kurt J. Lesker Co.	412-233-4200
PA	Feasterville, Knowles Assocs.	215-322-7100
TN	Knoxville, Physimetrics	615-966-7553
TX	Richardson, Spectra Sls.	214-234-3600
UT	Salt Lake City, J. F. Hurlbut	801-595-8818
WA	Seattle, J.J. Assocs.	206-246-6619

CERAMAWIRE, Box 1084, Cranford, NJ 07016, Tel: 201-276-1170; Empl.: 4; *Sls. Mgr.:* Edward Hamilton

CERAMIC DEVICES INC., 8145 Ronson Rd., San Diego, CA 92111, Tel: 619-560-7575, FAX: 619-560-4906; Empl.: 40; *Sls. Mgr.:* Linda Parrish

CERAMIC MAGNETICS, INC., 87 Fairfield Rd., Fairfield, NJ 07006, Tel: 201-227-4222, TELEX: 138 730, FAX: 201-227-6735; Empl.: 90

CERA-MITE CORP., 1327 Sixth Ave., Grafton, WI 53024, Tel: 414-377-3500, TELEX: 62916271, FAX: 414-377-7309; Empl.: 215; *Sls. Mgr.:* Claude Marquardt

CERMETEK MICROELECTRONICS INC., 1308 Borregas Ave., Sunnyvale, CA 94088-3565, Tel: 408-752-5000, TWX: 910-379-6931, FAX: 408-752-5004; Empl.: 50; *Sls. Mgr.:* Gilbert Chacon

C.G. INSTRUMENTS, 434 Windsor Pk. Dr., Dayton, OH 45459, Tel: 513-434-7643, FAX: 513-434-7643; Empl.: 5; *Sls. Mgr.:* Dale K. Mann

CGRS MICROTECH, P.O. Box 102L, Langhorne, PA 19047, Tel: 215-757-0284; Empl.: 5; *Sls. Mgr.:* J. Swope; *Dist. Mgr.:* J. Swope

CGTI, 2 Windward Ave., White Plains, NY 10605, Tel: 914-949-3719, TWX: 710-568-1305; Empl.: 170; *Sls. Mgr.:* G. N. Snider

CHABIN CORP., 890 Fortress St., Chico, CA 95926, Tel: 916-891-6410, TWX: 910-536-1001; *Sls. Mgr.:* Peter Tunis

CHACE PRECISION METALS, INC., 1704 Barnes St., Reidsville, NC 27320, Tel: 918-342-2381, FAX: 919-342-4012; Empl.: 170; *Sls. Mgr.:* Pat J. Urban

CHA INDUSTRIES, 3565 Haven Avenue, Menlo Park, CA 94025, Tel: 415-363-8011, TELEX: 334426, FAX: 415-363-8061; *Sls. Mgr.:* Jack Patten

CHALCO ENGRG. CORP., Chalco Industries, Inc., 15126 S. Broadway, Gardena, CA 90248-1898, Tel: 213-321-0121, 213-323-5525, TWX: 910-346-7026, FAX: 213-323-0405; Empl.: 95; *Sls. Mgr.:* Steven Kierman, Dir. Sls.

Champion Technologies, Inc.

FAX: 312-451-7585

CHAMPION TECHNOLOGIES, INC., 2553 N. Edgington, Franklin Park, IL 60131, Tel: 312-451-1000, TELEX: 4880104, ESYLNK: 62931824; Empl.: 175; *Sls. Mgr.:* John Keilman ..... **A•1360**

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FL	Orlando, Perrott Assocs.	407-288-7748
FL	Orlando, Perrott Assocs.	305-298-7748
GA	Duluth, Advanced Components Mktg.	404-447-5499
IN	Fort Wayne, R. O. Whitesell	219-432-5591
IN	Indianapolis, R. O. Whitesell	317-359-9283
IA	Cedar Rapids, R. F. Welert Co.	319-377-1575
MD	Glen Burnie, Third Wave Solutions	301-787-0220
MA	Natick, Wayland Engrg. Sls.	617-655-6080
MI	Southfield, R. O. Whitesell Assoc.	313-559-5454
MI	St. Joseph, R. O. Whitesell Assoc.	616-983-7337
MN	Minneapolis, Microelectronics Sls.	612-829-0948
MO	St. Louis, Abrams Assoc.	314-569-0447
NY	Great Neck, Trionic Assoc.	516-466-2300
NY	Rochester, Ossmann Comp. Sls.	716-442-4460
NY	Syracuse, Ossmann Comp. Sls.	315-437-7052
NC	Charlotte, Quantum Mktg.	704-365-4538
OH	Cincinnati, R. O. Whitesell	513-521-2290
OH	Cleveland, R.O. Whitesell & Assoc.	216-447-9020
OH	Columbus, R. O. Whitesell	614-888-9396
OH	Dayton, R. O. Whitesell	513-298-9546
OK	Tulsa, H. J. Daly Co.	918-494-7711
OR	Tigard, Elctrn. Sources	503-684-0040
PA	Glenside, Koebert Assoc.	215-887-2310
PA	Pittsburgh, R. O. Whitesell	412-963-6161
TX	Austin, Electra Reps.	512-339-1163
TX	Dallas, Electra Reps.	214-248-3852
UT	West Valley City, Thorson Co.	801-973-7969
WA	Bellevue, Electronic Sources	206-451-3500
WI	Milwaukee, KMA Sls. & Co.	414-259-1771
EXP	IL, Franklin Pk., Motorola	312-451-1000

Local Distributors

AL	Huntsville, Hallmark Elctrns.	205-837-8700
AL	Huntsville, Pioneer Elctrns.	205-837-9300
AZ	Phoenix, Hallmark Elctrns.	602-437-1200
AZ	Tempe, Bell Inds.	602-966-7800
AZ	Tempe, Western Microtechnlg.	602-948-4240
CA	Canoga Pk., Hallmark Elctrns.	818-716-7300
CA	Cupertino, Western Microtechnlg.	408-725-1660
CA	Garden Grove, Bell Inds.	714-220-0681
CA	Gardena, Bell Inds.	213-515-1800
CA	Reseda, Jan Dvcs.	818-708-1100
CA	Roseville, Bell Inds.	916-969-3100
CA	San Diego, Hallmark Elctrns.	619-268-1201
CA	San Jose, Hallmark Elctrns.	408-946-0900
CA	Sunnyvale, Bell Inds.	408-734-8570
CA	Thousand Oaks, Bell Inds.	805-499-6821
CA	Torrance, Hallmark Elctrns.	213-217-8410
CA	Tustin, Hallmark Elctrns.	714-669-0662
CO	Englewood, Hallmark Elctrns.	303-790-1662
CO	Wheatridge, Bell Inds.	303-424-1985
CT	Norwalk, Pioneer Elctrns.	203-853-1515
CT	Wallingford, Hallmark Elctrns.	203-269-0100
FL	Altamonte Springs, Pioneer Elctrns.	305-834-9090
FL	Clearwater, Hallmark Elctrns.	305-428-8877
FL	Ft. Lauderdale, Pioneer Elctrns.	305-771-9280
FL	Orlando, Hallmark Elctrns.	305-855-4020
FL	Pompano Bch., Hallmark Elctrns.	305-971-9280
GA	Norcross, Hallmark Elctrns.	404-447-8000
GA	Norcross, Pioneer Elctrns.	404-448-1711
IL	Elk Grove Vl, Bell Inds.	312-640-1910
IL	Elk Grove Vl, Pioneer Elctrns.	312-437-9680
IL	Wooddale, Hallmark Elctrns.	312-860-3800
IN	Indianapolis, Bell/Graham	317-634-8202
IN	Indianapolis, Pioneer Elctrns.	317-849-7300
KS	Lenexa, Hallmark Elctrns.	913-888-4747
MD	Columbia, Hallmark Elctrns.	301-988-9800
MD	Gaithersburg, Pioneer Elctrns.	301-921-0660
MA	Billerca, Hallmark Elctrns.	617-935-9777
MA	Lexington, Pioneer Elctrns.	617-861-9200
MI	Livonia, Pioneer Elctrns.	313-525-1800
MN	Bloomington, Hallmark Elctrns.	612-854-3223
MN	Minnetonka, Pioneer Elctrns.	612-935-5444
MO	Earth City, Hallmark Elctrns.	314-291-5350
NJ	Cherry Hill, Hallmark Elctrns.	609-424-7300
NJ	Fairfield, Hallmark Elctrns.	201-575-4415
NJ	Pinebrook, Pioneer Elctrns.	201-575-3510
NM	Albuquerque, Alliance Elctrns.	505-292-3360
NM	Albuquerque, Bell Inds.	505-292-2700
NY	Bayshore, Brookdale Elctrns.	516-242-8033
NY	Fairport, Pioneer Elctrns.	716-381-7070
NY	Ronkonkoma, Hallmark Elctrns.	516-737-0600
NY	Vestal, Pioneer Elctrns.	607-748-8211
NY	Woodbury, Pioneer Elctrns.	516-921-8700
NC	Charlotte, Pioneer Elctrns.	704-527-8188
NC	Raleigh, Hallmark Elctrns.	919-872-0712
OH	Cincinnati, Stotts-Friedman Co.	513-574-7701
OH	Cleveland, Pioneer Elctrns.	216-587-3600
OH	Dayton, Bell Inds.	513-434-8231
OH	Dayton, Pioneer Elctrns.	513-236-9900
OH	Dayton, Stotts-Friedman Co.	513-298-5555
OH	Solon, Hallmark Elctrns.	216-349-4632
OH	Westerville, Hallmark Elctrns.	614-891-4555
OK	Tulsa, Hallmark Elctrns.	918-665-3200
OR	Lake Oswego, Bell Inds.	503-241-4115
PA	Horsham, Pioneer Elctrns.	215-674-4000
PA	Pittsburgh, Pioneer Elctrns.	412-782-2300
TX	Austin, Hallmark Elctrns.	512-258-8848
TX	Austin, Pioneer Elctrns.	512-835-4000
TX	Dallas, Hallmark Elctrns.	214-343-5037
TX	Dallas, Pioneer Elctrns.	214-386-7300
TX	Houston, Hallmark Elctrns.	713-781-6100
TX	Houston, Pioneer Elctrns.	713-988-5555
UT	Salt Lake City, Bell Inds.	801-972-6969

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CHANNEL MICROWAVE, TRAK Microwave Corp., 3/4 Lindsay Court, Dundee Technlg. Pk., Dundee, Scotland DD2 1TY, Tel: 44-382-561509, TELEX: 76266, FAX: 44-382-562643; Empl.: 30

CHAPMAN CORP., P.O. Box 10700, 125 Presumpscot St, Portland, ME 04104, Tel: 207-773-4726, TELEX: 493 1536 CHAP UI, FAX: 207-775-7369; Empl.: 42; *Sls. Mgr.:* David Hall

CHARLES RIVER DATA SYSTEMS, INC., 983 Concord St., Framingham, MA 01701, Tel: 508-626-1000, TELEX: 681-7373, FAX: 508-626-1046; Empl.: 170; *Sls. Mgr.:* David Greer; *Dist. Mgr.:* David Greer

CHASSIS-TRAK, See General Devices

CHATHAM CONTROLS, 33 River Rd., Chatham, NJ 07928, Tel: 201-635-8892; FSC No.: 04814; Empl.: 11

CHATSWORTH DATA CORPORATION, 20710 Lassen St., Chatsworth, CA 91311, Tel: 818-341-9200; Empl.: 65; *Sls. Mgr.:* Hank Boehm ..... **D•1232**

CHAUVIN ARNOUX, Chauvin Arnoux-France, 5 Faraday Dr., Dover, NH 03820, Tel: 603-749-6434, FAX: 603-742-2346

CHEMREX INC., ResTech Prods. Div., 6120 E. 58th Ave., Commerce City, CO 80022, Tel: 303-289-5651, FAX: 303-289-5283; *Sls. Mgr.:* Michael P. Manegold

CHEMTRONICS INC., 681 Old Willets Path, Hauppauge, NY 11788, Tel: 516-582-3322, 800-645-5244, TELEX: 968567, FAX: 516-582-3046; FSC No.: 21267; Empl.: 112; *Sls. Mgr.:* Louis Friedman; *Dist. Mgr.:* Scott Friedman

CHENANGO INDUSTRIES, INC., 200 Stage Road, Vestal, NY 13850, Tel: 607-748-1572, TWX: 510-252-0899, FAX: 717-879-4220; *Sls. Mgr.:* Rick Hammond

FAX: 714-838-4742

CHEROKEE INTERNATIONAL, INC., Core Industries, 2841 Dow Avenue, Tustin, CA 92680-7211, Tel: 714-544-6665, TWX: 510-101-0493; Empl.: 350; *Sls. Mgr.:* Lonnie Friend ..... **D•1674-1679**

Local Sales Offices & Reps

CA Santa Clara, Cindel, Inc. 408-988-8331
CO Longmont, Butler Tech. Sls. 303-651-7703
FL Boca Raton, Naylor Assoc. 407-482-5649
AL Huntsville, Naylor Assoc. 205-882-0068
IL Downers Grove, Richmar Elctrns. 312-968-0118
IL Prairie Vl, Lima & Assocs. 913-642-7471
IN Indianapolis, Richmar Elctrns. Corp. ... 317-846-6383

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MO Ferguson, Lima & Assocs. 314-521-0785
NH Londonderry, Bennetron 603-432-9092
NJ Englewood, Sprung/Nussbaum 201-569-5666
NJ Lawrenceville, DVS Co. 609-896-1112
NY Ithaca, Bob Dean, Inc. 607-257-1111
NY Wappinger Falls, Bob Dean, Inc. 914-297-6406
NC Resch. Triangle Pk, Naylor Assocs., Inc. 612-929-0457
OH Richfield, Geotronix 216-659-6100
OH Trotwood, Geotronix, Inc. 216-659-6100
OR Beaverton, Elctrns. N.W. 503-629-9241
PA Allison Pk., Geotronix, Inc. 412-487-1770
TX Houston, Barry Sls., Inc. 713-784-5860
TX Richardson, Barry Sls., Inc. 214-234-0255
VA Fairfax, DVS Co. 703-273-0050
WA Redmond, Elctrns. N.W. 206-883-1959
Can Downsview, Ont., Elbit Elctrns. 416-633-5050

FAX: 312-360-3566

CHERRY ELECTRICAL PRODUCTS, Cherry Corporation, 3600 Sunset Avenue, Waukegan, IL 60087, Tel: 312-360-3500; Empl.: 1,000; *Sls. Mgr.:* George Sinnokrak; *Dist. Mgr.:* George Di Martino ..... **B•1052, 1698-1701, 1859**

Local Sales Offices & Reps

AL Huntsville, CSR Elec., Inc. 205-533-2444
AZ Phoenix, O'Donnell Assocs. S.W. 602-944-9542
CA San Diego, O'Donnell Assocs., Inc. 619-578-1645
CA San Jose, O'Donnell Assocs. N., Inc. 408-432-1940
CA Torrance, O'Donnell Assocs., Inc. 213-539-9664
CO Denver, Spectrum Mktg. Assocs., Inc. 303-480-9991
CT N. Haven, Coakley, Boyd & Abbett, Inc. 203-239-6217
FL Orlando, Cahill Assocs. 407-282-5117
FL Stuart, Cahill Assocs. 407-288-3113
GA Atlanta, CSR Elctrns., Inc. 404-396-3720
IL Waukegan, Cherry Elctrl. Prods. 312-360-3500
IN Ft. Wayne, Menze Sls., Inc. 219-747-5616
IA Cedar Rapids, Dy-Tronix, Inc. 319-377-8275
KS Leawood, Dy-Tronix, Inc. 913-339-6333
KS Wichita, Dy-Tronix, Inc. 316-838-0884
MA Needham Hgts., Coakley, Boyd & Abbett, Inc. 617-444-5470
MI Farmington Hills, Cherry Elctrl. Prods., Automative 313-477-4477
MI Grand Rapids, Miltimore Sls., Inc. 616-942-9721
MI Novi, Miltimore Sls., Inc. 313-349-0260
MN St. Paul, Cahill, Schmitz & Cahill 612-646-7217
MO Bridgeton, Dy-Tronix, Inc. 314-291-4777
NJ Pitman, Colrud Corp. 609-589-5866
NJ W. Caldwell, Grimm, Siegel Assocs., Inc. 201-575-9300
NM Albuquerque, O'Donnell Assocs., S.W. 505-889-4522
NY Pittsford, Elcom Sls., Inc. 716-385-1400
NY Skaneateles, Elcom Sls., Inc. 315-685-8967
NC Charlotte, CSR Elctrns. 704-847-5806
NC Raleigh, CSR Elctrns., Inc. 919-878-9200
OK Tulsa, Comptech Sls., Inc. 918-622-7744
OR Portland, Westmark Elctrns., Inc. 503-641-8780
TN Knoxville, CSR Elctrns. 615-577-1317
TX Austin, Comptech Sls., Inc. 512-331-8922
TX Houston, Comptech Sls., Inc. 713-776-8330
TX Irving, Comptech Sls., Inc. 214-751-1181
UT Ogden, Spectrum Mktg. Assocs., Inc. .. 801-972-8552
IN Indianapolis, Bell Inds. 317-875-8200
WA Seattle, Westmark Elctrns., Inc. 206-281-4025
Can Coquitlam, B.C., r.n. Longman Sls., Inc. 604-931-4744
Can Kirkland, r.n. Longman Sls., Inc. 514-694-3911
Can Mississauga, Ont., r.n. Longman Sls., Inc. 416-670-8100
Can Ottawa, Ont., r.n. Longman Sls., Inc. ... 613-564-0100

Local Distributors

AL Birmingham, Ack Radio Supp. Co. 205-322-0588
AL Huntsville, Bell Inds. 205-837-1074
AL Huntsville, Powell Elctrns. 205-539-2731
AZ Phoenix, Future Elctrns. 602-968-7140
AZ Tempe, Harper S.I.D. 602-967-1464
AR Little Rock, Carlton-Bates 501-562-9100
CA Chatsworth, Future Elctrns. 818-700-0914
CA Compton, Harper S.I.D. 213-979-5090
CA Gardena, Cal Switch 213-770-2330
CA Irvine, Future Elctrns. 714-250-4141
CA Los Angeles, Elec. Switches 213-660-1310
CA Oakland, Brill Elctrns. 415-834-5888
CA Sacramento, Integrated Elec. 916-424-5297
CA San Diego, Future Elctrns. 619-278-5020
CA San Diego, Harper S.I.D. 619-578-2500
CA San Jose, Future Elctrns. 408-434-1114
CA San Jose, Harper S.I.D. 408-943-9490
CA Sunnyvale, Target Elctrns. 408-734-5611
CO Arvada, Denver Beta Wintronics 303-431-7161
CO Denver, Integrated Elec. 303-292-6121
CT Wallingford, Midan Elec., Inc. 203-265-2077
FL Ft. Lauderdale, KSM Elctrns. 305-971-5900
FL Ft. Lauderdale, Powell Elctrns. 305-484-8377
FL Ft. Lauderdale, Reptron Elctrns. 305-979-8227
FL Tampa, Reptron Elctrns. 813-855-4656
GA Atlanta, Ack Radio Supp. Co. 404-351-6340
GA Atlanta, KSM Elctrns. 404-458-2013
IL Champaign, Klaus Radio, Inc. 217-356-1896
IL Chicago, Newark Elctrns. 312-784-5100
IL Palatine, OHM Elctrns., Inc. 312-359-5500
IL Wheeling, Hawk Elctrns. 312-459-4030
IN Ft. Wayne, Bell Inds. 219-423-3422
IN Indianapolis, Bell Inds./Graham 317-875-8200
IN Indianapolis, PEI Genesis Elec. 317-879-0700
IN South Bend, PEI Genesis Elect. 219-287-2911
IA Cedar Rapids, Advent Elec., Inc. 319-363-0221
KS Edwardsville, Tennant Elctrns. 913-441-1801
MD Columbia, Powell Elctrns. 301-621-8080
MD Savage, Pyttronic Inds., Inc. 301-792-0780
MA Needham, Cronin Elctrns., Inc. 617-449-5000
MA Newton, Greene-Shaw Co. 617-969-8900
MI Livonia, Reptron Elect., Inc. 313-525-2700
MN Minneapolis, Newark Elctrns. 612-331-6350
MN Minneapolis, Stark Elctrns. 612-332-1325
MN Minneapolis, Sterling Elctrns. 612-831-2666
MO Kansas City, Walters Radio Supp. 816-531-7015
MO St. Charles, Finnigan Elctrns. 314-946-6201
NJ Clifton, J-Mar Elect., Inc. 201-772-6400
NM Albuquerque, Walker Elctrn. Supp. 505-883-2992
NY Buffalo, Summit Dists. 716-887-2800
NY Hempstead, Davis Elctrns. 516-483-9200
NY Rochester, Summit Dists. 716-334-8110
NY Westbury, Tennant Elctrns. 516-333-3930
NC Cary, Powell Elctrns. 919-467-1212
NC Winston-Salem, Kirkman Elect. 919-722-9131
OH Cincinnati, Hughes-Peters, Inc. 513-351-2000
OH Columbus, Hughes-Peters, Inc. 614-294-5351
OH Dayton, Bell Inds. 513-435-8660
OH Warren, REM Elctrns. Supp. Co. 216-373-1300
OH Worthington, Reptron Elctrns. 614-436-6675
OK Tulsa, Radio, Inc. 918-587-9123
OR Beaverton, Integrated Elec. 503-641-1690
OR Portland, Radar Elec. 503-232-3404
OR Portland, Tek-Elec. 503-246-5451
PA Erie, REM Elctrns. Supp. Co. 814-453-5626
PA Montgomeryville, Pyttronics Inds., Inc. 215-643-2850
PA Philadelphia, Powell Elctrns. 215-365-1900
PA Philadelphia, PEI Genesis Elect. 800-523-0727, 800-222-1772
TX Dallas, Southwest Elec., Inc. 214-234-3050
TX Dallas, Wallace Elec. Co., Inc. 214-340-0400
TX Irving, Harper S.I.D. 214-621-0500
TX San Antonio, Sherman Elctrns. Supp. 512-224-1004
TX Stafford, Southwest Elec., Inc. 713-240-4000
UT N. Salt Lake City, Integrated Elctrns. .. 801-298-1869
UT Salt Lake City, Stand. Supp. Co. 801-486-3371
VA Richmond, Sterling Elctrns. 804-226-2190
WA Bellevue, Integrated Elctrns., Inc. 206-455-2727
WA Seattle, Radar Elctrns. 206-282-2511
WI Milwaukee, Marsh Elctrns., Inc. 414-475-6000
WI Waukesha, Hawk Elctrns. 414-547-4457
Can Burnaby, B.C., ITT/Rae Ind. Elect. 604-291-8866
Can Concord, Ont., Trade Elctrns. Supp. ... 416-661-7111
Can Edmonton, Alberta, ITT/Rae Ind. Elect. 403-451-4001
Can London, Ont., C. M. Peterson Co., Ltd. 519-434-3204
Can Mississauga, Ont., Prelco Elect., Ltd. .. 416-678-0401
Can Montreal, Que., Prelco Elect., Ltd. 514-389-8051
Can Nepean, Ont., Prelco Elect., Ltd. 613-726-1800

CHERRY SEMICONDUCTOR CORP, 2000 S. County Trail, East Greenwich, RI 02818, Tel: 401-885-3600, TELEX: WUI 6817157; FSC No.: WUI 6817157;;;401-885-5786; Empl.: 365

CHESSELL CORP., 1 Pheasant Run, Newtown, PA 18940, Tel: 215-968-0660, TELEX: 685-1130; Empl.: 72; *Sls. Mgr.:* Charles Fetty; *Dist. Mgr.:* C. Fetty

CHESTER CABLE, Alcatel, N. A., Oakland Ave., Chester, NY 10918, Tel: 914-469-2141, TWX: 510-249-4813, FAX: 914-469-9935

CHESTERFIELD PRODUCTS, 37 Midland Ave., Elmwood Park, NJ 07407, Tel: 201-797-9655, FAX: 201-797-9504; Empl.: 35; *Sls. Mgr.:* M. Perry ..... **A•1690**

Local Sales Offices & Reps

AZ	Phoenix, CPS Assocs., Inc.	602-246-1097
CA	Palo Alto, J M Assocs.	415-857-1260
CA	San Diego, MTM Intl, Inc.	619-563-8520
FL	Coral Springs, Reynolds & Assocs. Inc.	305-344-4536
FL	Melbourne, Reynolds & Assocs. Inc.	407-259-7000
GA	Atlanta, Reynolds & Assocs., Inc.	404-925-9115
MD	Baltimore, Advanced Tech. Sls.	301-323-3140
MA	Framingham, Bengal Assocs.	617-877-2639
MA	Randolph, Bengal Assocs.	617-961-4120
NJ	Elmwood Park, L & M Assocs.	201-797-0441
NY	New York, L & M Assocs.	212-243-6155
PA	Andalusia, L & M Assocs.	215-245-6658
TX	Richardson, Carl Tinch Sls. Co.	214-231-1322
WA	Seattle, Datacom Assocs., Inc.	206-285-2525

CHICAGO CONDENSER CORP., 2900 West Chicago Ave., Chicago, IL 60622, Tel: 312-227-7070, FAX: 312-227-6646; *Sls. Mgr.:* Joan Looi

CHICAGO LASER SYSTEMS, INC., 4034 N. Nashville Ave., Chicago, IL 60634, Tel: 312-282-2710, TELEX: 617-1269 LASER UW, FAX: 312-282-8455; *Sls. Mgr.:* Bernard Alpiner, V.P.

CHICAGO LOCK CO., 4311 W. Belmont Ave., Chicago, IL 60641, Tel: 312-282-7177, TELEX: ITT 4994023, FAX: 312-282-8199; Empl.: 375; *Sls. Mgr.:* Dale N. Padjen

CHLORIDE ELECTRO NETWORKS, Chloride Power Electronics, Inc., Maple Street, Caledonia, NY 14423, Tel: 716-538-4421, TWX: 510-254-0422, FAX: 716-538-8017

CHLORIDE POWER ELECTRONICS, 10931 Pellicano Drive, El Paso, TX 79935, Tel: 915-592-9985, FAX: 915-595-1664; FSC No.: 08715; Empl.: 1000; *Sls. Mgr.:* Robin Lee

CHOMERICS, INC.:W.R. GRACE & CO., 77 Dragon Ct., Woburn, MA 01888, Tel: 617-935-4850, TWX: 710-393-0173; Empl.: 650; *Sls. Mgr.:* William G. Lionetta, Jr.; *Dist. Mgr.:* Gary L. Wood

CHR INDUSTRIES, INC., Fluorcarbon Co., 407 East St., P.O. Box 1911, New Haven, CT 06509, Tel: 203-777-3631, TWX: 710-465-0264; Empl.: 116; *Sls. Mgr.:* Frank Reilly; *Dist. Mgr.:* Frank Reilly

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CHRISTIE ELECTRIC CORP., 18120 S. Broadway, Gardena, CA 90248, Tel: 213-715-1402, TWX: 910-349-6260; FSC No.: 02294; Empl.: 90; *Sls. Mgr.:* Hank Kohnen **D•1474-1477, 1680**

Local Sales Offices & Reps

CA	Los Altos, Frauman Assocs.	415-941-0660
CA	Mission Viejo, Freben Intl, Inc.	714-770-1072
CA	Sacramento, Hikok Entprs.	916-344-1758
FL	Orlando, Newco, Inc.	305-293-7700
GA	Lithia Springs, Newco, Inc.	404-941-6077
IN	Indianapolis, Carter, McCormic & Peirce	317-244-1685
MD	Laurel, CSDS	301-490-3800
MA	Wayland, Daner-Hayes, Inc.	617-655-0888
MN	Minneapolis, Deerland Distrs.	612-331-6433
MO	Independence, Engineering Svcs., Co.	816-254-3600
MO	St. Louis, Engineering Svcs., Co.	314-997-1515
NY	Wantagh, Bytec Reps.	516-781-7400
NM	Albuquerque, Brytec Sls., Inc.	505-884-1123
OH	Cleveland, Carter, McCormick & Peirce	216-779-5100
OH	Dayton, Carter, McCormic & Peirce	513-836-0951
PA	Cheltenham, Stein Instrumentation	215-379-1990
PA	Pittsburgh, Carter, McCormic & Peirce	412-826-3800
TX	Richardson, Carl Tinch Sls. Co.	214-231-1322
UT	Murray, Butterworth Mktg.	801-268-2244
WA	Seattle, Advanced Power Prod.	206-852-9558
WI	Genoa City, Vineland Tech. Sls.	414-279-3871

Local Distributors

CT	Stanford, Aero Quality Sls.	203-351-8500
GA	Atlanta, Piemont Aviation Svcs.	404-765-1850
MI	Brighton, Applied Power Prods.	313-227-3604
TN	Memphis, Aircraft Parts Intl.	901-345-1832
TX	Dallas, Aviall Corp.	214-357-1811
TX	Houston, Matt Mathews Rechargeable Batteries	713-641-6449

CHROMALOX INSTRS. & CONTROLS, 1382 Heil-Quaker Blvd., La Vergne, TN 37086-3536, Tel: 615-793-3900, TELEX: 55-5129, FAX: 615-793-3563; Empl.: 110; *Sls. Mgr.:* Mary Hausman **D•1141**

CHROMATICS, 2558 Mountain Ind. Blvd, Tucker, GA 30084, Tel: 404-493-7000, TWX: 810-766-8099

CHRONO-LOG CORP., 2 W. Park Rd., Havertown, PA 19083, Tel: 215-853-1130, FAX: 215-853-3972; Empl.: 20; *Sls. Mgr.:* Kathy Jacobs **D•1084**

Local Sales Offices & Reps

AL	Huntsville, Dynamic Measurements	205-535-6663
Can	Don Mills, Ont., York Instrs.	416-445-1255,

CHURCHILL CORP., 344 Franklin St., Box G, Melrose, MA 02176, Tel: 617-665-4700; FSC No.: 94867; Empl.: 30; *Sls. Mgr.:* W. Schermerhorn

CICOIL CORP., 24960 Ave. Tibbitts, Valencia, CA 91355-3428, Tel: 805-295-1295, FAX: 805-295-0813; Empl.: 75; *Sls. Mgr.:* Tad Shiner

CIMCO WIRE & CABLE, INC., See Specialty Cable Corp.

CINCH

CINCH CONNECTOR DIVISION, Labinal Components & Systems Inc., 1501 Morse Ave., Elk Grove Village, IL 60007, Tel: 312-981-6000, TWX: 910-222-1796; *Sls. Mgr.:* James L. Hartranft Jr.; *Dist. Mgr.:* Scott Campbell **C•1305-1307**

Local Sales Offices & Reps

AL	Huntsville, R.O. Whitesell & Assocs.	205-883-5110
AZ	Scottsdale, Pinnacle Elctrn. Comp. Sls., Inc.	602-994-0441
CO	Boulder, Front Range Mktg.	303-443-4780
CA	Calabasas, Centaur Corp.	818-704-1655
CA	Irvine, Centaur Corp.	714-261-2123
CA	San Diego, Centaur Corp.	619-278-4950
CA	Santa Clara, Technology Sls., Inc.	408-727-7200
CT	Branford, Coakley, Boyd & Abbett	203-481-2218
CT	Weston, South Atlantic Comp. Sls.	203-226-6547
FL	Orlando, South Atlantic Comp. Sls.	407-857-3650
GA	Norcross, South Atlantic Comp. Sls.	404-447-6154
IL	Itasca, Circuit Sls., Inc.	312-773-0200
IN	Ft. Wayne, R.O. Whitesell & Assocs.	219-432-5591
IN	Indianapolis, R.O. Whitesell & Assocs.	317-359-9283
IN	Kokomo, R.O. Whitesell & Assocs.	317-457-9127
IA	Cedar Rapids, C.H. Horn & Assocs.	319-393-8703
KS	Wichita, DLE Elctrns.	316-683-6400
KY	Pewee Valley, R.O. Whitesell & Assocs.	502-241-1441
MA	Needham Heights, Coakley, Bond & Abbett	617-444-5470
MI	Grand Blanc, R.O. Whitesell & Assocs.	313-695-0770
MI	Grand Rapids, R.O. Whitesell & Assocs.	616-942-5420
MI	Southfield, R.O. Whitesell & Assocs.	313-559-5454
MI	St. Joseph, R.O. Whitesell & Assocs.	616-983-7337
MN	Minneapolis, Tecteam Sls., Inc.	612-854-6616
MO	St. Louis, John G. Macke Co.	314-432-2830
NJ	Hackensack, Coakley, Boyd, Abbett/Tylinski	201-440-4114
NY	Binghamton, Empire Tech. Assocs., Inc.	607-772-0651
NY	East Rochester, Empire Tech. Assocs., Inc.	716-381-8500
NY	Skaneateles, Empire Tech. Assocs., Inc.	315-685-5703
NC	Raleigh, South Atlantic Comp. Sls.	919-859-9970
OH	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290
OH	Cleveland, R.O. Whitesell & Assocs.	216-447-9020
OH	Columbus, R.O. Whitesell & Assocs.	614-888-9396
OH	Dayton, R.O. Whitesell & Assocs.	513-298-9546
OR	Beaverton, Earl & Brown Co., Inc.	503-643-5500
PA	Chestnut Hill, Deltatronics, Inc.	215-248-0294
PA	Pittsburgh, R.O. Whitesell & Assocs.	412-963-6161
TN	Knoxville, R.O. Whitesell & Assocs.	615-694-9476
TX	Austin, Sunbelt Comps., Inc.	512-335-0499
TX	Dallas, Sunbelt Comps., Inc.	214-248-8000
UT	Midvale, Front Range Mktg.	801-566-2500
WA	Redmond, Earl & Brown Co., Inc.	206-885-5064
WI	Brookfield, Circuit Sls., Inc.	414-784-7773
Can	Mount Gabriel, Que., Renmark Elctrns. Ltd.	514-229-5467
Can	Nepean, Ont., Renmark Elctrns. Ltd.	613-727-0320
Can	Richmond Hill, Ont., Renmark Elctrns. Ltd.	416-881-8844

Local Distributors

AZ	Tempe, Arrow Elctrns.	602-968-4800
CA	Canoga Pk., Hallmark Elctrns.	818-773-4500
CA	Chatsworth, Arrow Elctrns.	818-701-7500
CA	Sunnyvale, Arrow Elctrns.	408-745-6600
CA	Sunnyvale, Bell Cable Div.	408-745-0400
CA	Sunnyvale, Harper S.I.D.	408-943-9490
CA	Tustin, Hallmark Elctrns.	714-669-4100
FL	Deerfield Beach, Arrow Elctrns.	305-429-8200
IL	Bensenville, Hallmark Elctrns.	312-860-3800
IL	Bensenville, Hamilton/Avnet Elec.	312-860-7780
IL	Itasca, Arrow Elctrns.	312-250-0500
MD	Baltimore, Hallmark Elctrns.	301-988-9800
MD	Gaithersburg, Pioneer/Washington	301-921-0660
MA	Hingham, Sager Elec. Supp.	617-749-6700
MA	Norwood, Gerber Radio Supp.	617-329-2400
MA	Woburn, Arrow Elctrns.	617-933-8130
NJ	Fairfield, Hallmark Elctrns.	201-575-4415
NY	Hauppauge, Arrow Elctrns.	516-231-1000
NY	Melville, Hamilton/Avnet Elec.	516-231-9800
NY	Rochester, Arrow Elctrns.	716-275-0300
NC	Raleigh, Arrow Elctrns.	919-876-3132
OH	Cleveland, Pioneer/Cleveland	216-587-3600
OH	Dayton, Pioneer/Dayton	513-236-9900
TX	Carrollton, Arrow Elctrns.	214-380-6464
TX	Dallas, Hallmark Elctrns.	214-553-4300

CINCH CYLINDRICAL DIVISION, Labinal Comps. & Systems, Inc., 8821 Science Center Dr., Minneapolis, MN 55428, Tel: 612-537-1010, FAX: 612-537-9614; *Sls. Mgr.:* Jim Simmons

CINCINNATI ELCTRNS., 2630 Glendale Milford Rd., Cincinnati, OH 45241, Tel: 513-733-6100, TELEX: 21-4452, TWX: 810-464-8151; FSC No.: 80045; Empl.: 800

CINCINNATI ELECTROSYSTEMS, 420 Wards Corner Rd., Loveland, OH 45140, Tel: 513-831-6800, TELEX: 312328, FAX: 513-831-4866; Empl.: 110; *Sls. Mgr.:* J. Patrick Laux

CINCINNATI SUB-ZERO PRODS., 12011 Mosteller Rd., Cincinnati, OH 45241, Tel: 513-772-8810, TELEX: 214390 SUBZERO CIN, FAX: 513-772-9119; Empl.: 80; *Sls. Mgr.:* Harold Zeilman

CIPHER DATA PRODS., INC., P.O. Box 85170, San Diego, CA 92138, Tel: 619-578-9100, TWX: 910-335-1251, FAX: 619-549-8037; Empl.: 2000; *Sls. Mgr.:* Wes Bankston, VP Sls.; *Dist. Mgr.:* Wes Bankton

CIPRICO INC., 2955 Xenium Lane, Plymouth, MN 55441, Tel: 612-559-2034, FAX: 612-559-8799; Empl.: 79; *Sls. Mgr.:* Bill Rost

CIRCLE ELECTRONICS, A Division of F-Dyne Elctrns., 3501 Electronics Way, W. Palm Beach, FL 33407, Tel: 407-844-1310, FAX: 407-842-1858; *Sls. Mgr.:* William Edwards

CIRCUIT ASSEMBLY CORP., 18 Thomas St., Irvine, CA 92718-2703, Tel: 714-855-7887, TELEX: 183109UD, FAX: 714-855-4298; FSC No.: 52072; Empl.: 275; *Sls. Mgr.:* Edward Cadden

CIRCUITECH, INC., Division of Heyco, Inc., 542 Industrial Way West, Eatontown, NJ 07724, Tel: 201-542-6550, FAX: 201-542-1612; Empl.: 80; *Sls. Mgr.:* Ron Calvo

CIRCUIT TECHNOLOGY INC., 160 Smith St., Farmingdale, NY 11735, Tel: 516-293-8686, TWX: 510-224-6555; Empl.: 600; *Sls. Mgr.:* Kurt Kuhl

CIR-Q-TEL, INC., 6600-04 Virginia Manor Rd., Beltsville, MD 20805, Tel: 301-946-1800, TWX: 710-828-0521, ESYLNK: 62756149, FAX: 301-949-1874; FSC No.: 21377; Empl.: 45

CIRRIS SYSTEMS, 1864 S. State, Ste 90, Salt Lake City, UT 84115, Tel: 801-466-6600, 800-424-7747, TELEX: 446786 Cirris UD, FAX: 801-487-7494; Empl.: 25; *Sls. Mgr.:* Brent Stringham **D•1233**

CIRTECH, EG & G, 15237 Cherry St., Shawnee Mission, KS 66223, Tel: 913-681-2801, TWX: 910-749-6806; FSC No.: 5915; Empl.: 100; *Sls. Mgr.:* Wallace C. Wilson

CITIZEN BUSINESS MACHINES, See CBM America Corporation

CLAIREX ELECTRONICS, Clairex Corporation, 560 S. 3rd Ave., Mt. Vernon, NY 10550, Tel: 914-664-6602, FAX: 914-664-6449; Empl.: 192; *Sls. Mgr.:* Gerald Smith; *Dist. Mgr.:* George W. Farrall **B•1320**

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FL Boca Raton, Sales Specialists ... 305-395-5371
FL Largo, Sales Specialists ... 813-530-5545
GA Doraville, Advanced Comps. Mktg. ... 404-448-7025,
IL Chicago, Berndt Assoc. ... 312-283-0713
IN Carmel, Berndt Assoc. ... 317-884-0114
MA Bolton, Key Sales Assocs. ... 617-779-2780
MI Royal Oak, Hilltronics ... 313-435-0920,
MN Minneapolis, H.M.R. ... 612-920-8200
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MO Raytown, Cen Tech, Inc. ... 816-358-8100
OH Richfield, Geotronix ... 216-659-6100
OH Trotwood, Geotronix Inc. ... 513-854-5939
PA Allison Park, Geotronics, Inc. ... 412-487-1770
PA Newtown Square, W. Reeves Assoc. .. 215-356-7500
TX Dallas, J. B. Guenther ... 214-691-8500
UT Sandy, GTM Assocs.,Inc. ... 801-483-4103
WA Seattle, H. Levinson ... 206-323-5100
WI Milwaukee, Berndt Assoc. ... 414-545-8400
EXP NJ, Oradell, Sylvan Ginsbury ... 201-261-3200

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CA Culver City, EV Roberts ... 213-870-9561
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CA San Carlos, Control Design Supp.,Inc. ... 408-996-9197
CT Wallingford, Sager Elctrns. ... 203-265-4600
FL Miami, Elctrn. Equip. ... 305-871-3500
IL Chicago, Bell Indus. ... 312-982-9210
IN Indianapolis, Graham Elctrns. ... 317-634-8486
IN Indianapolis, Meunier Elec. Supp. ... 800-638-6437
MD Rockville, All American Transistor ... 301-251-1205
MA Hingham, Sager Elctrns. ... 617-749-6700
MA Norwell, Bordewieck Eng. Sls. ... 617-659-4915
MI Ann Arbor, Wedemeyer Elctrn. ... 313-665-8611
MN Minneapolis, Stark Elctrns. ... 612-332-1325
MO St. Louis, Van Sickle Radio Elect. ... 314-621-5000
NJ Mt. Laurel, D.F. Assocs. ... 609-234-5324
NY Buffalo, Summit Distr. ... 716-884-3450
OH Columbus, Hughes Peters ... 614-294-5351
OK Tulsa, Altair ... 918-665-0523
TX Houston, Altair ... 713-462-2410
TX Richardson, Altair ... 214-231-5166
WA Seattle, Radar Elec. ... 206-282-2511
Can Willowdale, Ont., Electro Sonic ... 416-494-1666

GENERAL INSTRUMENT

FAX: 312-262-7819

C.P. CLARE CORP., 3101 W. Pratt Blvd., Chicago, IL 60645, Tel: 312-262-7700, TELEX: 210075; Empl: 2400; *Sls. Mgr.:* Dermot Brereton; *Dist. Mgr.:* Dermot Brereton ... **B•1410, 1442-1443**

Local Sales Offices & Reps

AL Huntsville, Electramark Assocs. ... 205-830-4400
AZ Scottsdale, Summit Sls. ... 602-998-4850
CA El Toro, Gen. Instr., Clare Div. ... 714-586-0650
CA Los Angeles, Reed Elctrn. Mktg. ... 213-598-6676
CA San Diego, Gary Chilcote Assocs. ... 619-728-7678
CA San Jose, Ruppert Sls. & Engrg. ... 408-998-8717
CO Broomfield, Western Region Mktg. ... 303-469-8088
CT Waterbury, ConnTech-Ranan ... 203-754-2823
FL Altamonte Springs, Sls. Engrg. Concepts ... 407-682-4800
FL Deerfield Beach, Sls. Engrg. Concepts ... 305-427-7338
FL Tampa, Sls. Engrg. Concepts ... 813-854-2859
GA Norcross, Electramark ... 404-446-7915
IN Indianapolis, Schank Elctrn. Mktg. ... 317-842-6204
IA Cedar Rapids, Lorenz Sls. Inc. ... 319-377-4666
KS Merriam, Lorenz Sls. Inc. ... 913-384-6556
MD Randallstown, Beacon North Inc. ... 703-478-2480
MA Needham Heights, Kanan Assocs. ... 617-449-7400
MI Troy, Schank Elctrn. Mktg. ... 313-588-2040
MN Eden Prairie, High Technlg. Sls. Assocs. ... 612-944-7274
MO St. Louis, Lorenz Sls. ... 314-997-4558
NE Lincoln, Lorenz Sls. ... 402-475-4660
NJ Palisades Park, Janco Technlg. ... 201-941-4008
NY Hicksville, General Instr., Clare Div. ... 516-933-3645
NY Rochester, Electra Sls. Corp. ... 716-427-7860
NY Syracuse, Electra Sls. Corp. ... 315-463-1248
NC Raleigh, Zucker Assocs. ... 919-782-8433
OH Cleveland, Baehr, Greenleaf & Assoc. ... 216-892-1770
OH Dayton, Baehr-Greenleaf & Assocs. ... 513-439-0724
OR Portland, Westmark Elctrns. Inc. ... 503-641-8780
PA Erdenheim, Omni Sls. ... 215-233-4600
PA Evans City, Baehr-Greenleaf & Assocs. ... 412-776-2151
TX Dallas, Electra Reps ... 214-248-3852
TX Houston, Electra Reps ... 512-339-1163
UT Salt Lake City, Western Region Mktg. ... 801-486-1646
VA Sterling, Beacon North, Inc. ... 703-478-2480
WA Seattle, Westmark Elctrns. Inc. ... 206-281-4025
Can Toronto, Ont., Generl Instr. Of Can., Ltd. ... 416-789-7831

CLARKE-HESS COMMUNICATIONS RESEARCH CORP., 220 West 19th St., New York, NY 10011, Tel: 212-255-2940, TELEX: 238667-RAPID NYK, FAX: 212-675-2451; FSC No.: 34423; Empl.: 14 ... **D•1234-1235**

Local Sales Offices & Reps

AL Huntsville, Teqspec ... 205-883-6699
CT Manchester, ICS Assocs. ... 203-649-3765
FL Cocoa Bch., Teqspec ... 305-783-3444
FL Palm Harbor, Teqspec ... 813-785-2276
GA Norcross, Teqspec ... 404-242-7215
GA Snellville, Teqspec ... 404-972-7955
IL Chicago, Pat Lind Elctrns. ... 312-726-3513
IN Indianapolis, Pat Lind Elctrns. ... 317-632-7444
MA Westford, ICS Assocs. ... 617-692-3545
MN Circle Pines, Pat Lind Elctrns. ... 612-786-5770
NC Winston-Salem, Teqspec ... 919-765-5553
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FAX: 603-742-0481

CLAROSTAT MFG. CO., INC., Hawker Siddeley, PLC., 3 Washington St., Dover, NH 03820, Tel: 603-742-1120,800-872-0042, TELEX: MCI 6713344; FSC No.: 12697; Empl.: 600; *Sls. Mgr.:* Al Pepin (OEM); *Dist. Mgr.:* Al Tapscott ... **A•1918-1919, 2088-2091; B•1009, 1940-1941**

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AZ Phoenix, More Sls. ... 602-265-9201
AR Little Rock, J. Y. Schoonmaker ... 501-375-2168
CA Costa Mesa, Gravley & Assoc. Inc. ... 714-852-9994
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NH Home Off., Clarostat ... 603-742-1120, 1-800-872-0042
NY Fairport, Leonard D. Allen ... 716-377-3500
NY Manhasset, Win-Cor Elctr. Sls. ... 516-627-9474
NY Syracuse, L. D. Allen ... 315-437-8387
NC Raleigh, Millar Elctrns. ... 919-828-8840
OH Dayton, K.W. Elctrn. Sls. ... 513-890-2150
OH Shaker Hgts., K.W. Elctrn. Sls. ... 216-491-9177
OK Oklahoma City, J. Y. Schoonmaker ... 214-349-1650
OR Beaverton, Electronic Sources, Inc. ... 503-627-0838
PA Allison Park, K.W. Elctrn. Sls. ... 412-487-4300
TX Dallas, J. Y. Schoonmaker ... 214-349-1650
UT Sandy, Delltron Co. ... 801-942-4678
WA Bellevue, Elctrn. Sources, Inc. ... 206-451-3500
WI Brookfield, Sumer ... 414-784-6641

CLARY CORP., Precision Instrs. Div., 320 W. Clary Ave., San Gabriel, CA 91776, Tel: 818-287-6111, TWX: 910-589-3369, FAX: 818-286-7216; Empl.: 70; *Sls. Mgr.:* Stewart Nowak; *Dist. Mgr.:* Chris Dean

CLAUSS CUTLERY CO., Alco Industries, 223 N. Prospect St., Fremont, OH 43420, Tel: 419-332-7344, FAX: 419-332-8077; Empl.: 90; *Sls. Mgr.:* Thomas D. Reinert; *Dist. Mgr.:* Thomas D. Reinert

CLEAN ROOM PRODS., 1800 Ocean Ave., Ronkonkoma, NY 11779-6528, Tel: 516-588-7000, TELEX: 645151; Empl.: 110; *Sls. Mgr.:* Robert S. Kearton

CLEVELAND CRYSTALS, Box 17157, Euclid, OH 44117, Tel: 216-486-6100, TWX: 810-421-8031, FAX: 216-486-6103; FSC No.: 8K400; Empl.: 46; *Sls. Mgr.:* P. D. Marlowe

CLIFTON PRECISION, Litton Systems, Inc., Marple at Broadway, Clifton Hgts., PA 19018, Tel: 215-622-1000, TWX: 510-669-9782, FAX: 215-623-6344; FSC No.: 86197; Empl.: 1000; *Sls. Mgr.:* C.Scalies ..... **B•1238**

Local Sales Offices & Reps

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CA	Canoga Pk, Clifton Precision	818-347-0603
CA	Cupertino, Clifton Precision	408-996-7507
CA	Los Gatos, Luscombe Engrg. Co.	408-370-2020,
CA	Ontario, Clifton Precision	714-983-9374
CA	San Clemente, Clifton Precision	714-492-6904
CO	Denver, Motion Technlg.	303-757-3003
FL	Longwood, Boetto Corp.	407-331-1771
MA	W. Newton, Larcom Inc.	617-244-2053
MN	Eden Prairie, PWC, Inc.	612-934-1409
MO	St. Louis, Midwest Meridian	314-878-4441
OR	Tigard, Vantage Corp.	503-620-3280,
PA	Clifton Heights, Eastern Sls.	215-622-1000
TX	Garland, Carey, McMahill & Assocs.	214-681-1414
MI	Grand Rapids, Midwest Meridian	616-698-7391
WA	Bellevue, Vantage Corp.	206-455-3460,

CLIMATRONICS, 140 Wilbur Pl, Bohemia, NY 11716, Tel: 516-567-7300, TELEX: 5101007669; Empl.: 46; *Sls. Mgr.:* David Gilmore

CLIPLITE, See Visual Communications

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CML MACARR, A Marine Electric Systems Co., 50 Canal St, P.O. Box 1135, Clifton, NJ 07014-1135, Tel: 201-471-6800, TELEX: 139 039; FSC No.: 00062; Empl.: 100; *Sls. Mgr.:* Gary Mandell ..... **D•1009**

Local Sales Offices & Reps

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MI	Detroit, Bill Teplitz Associates	216-439-3265
OH	Cincinatti, Teplitz Assocs.	513-481-1648
OH	Cleveland, Teplitz Assocs.	216-439-3265
Can	Montreal, Metrone	514-483-2323,

CMV SOFTWARE SPECIALISTS INC., 5009 W. 12th St, Sioux Falls, SD 57106, Tel: 605-338-6645

COAST COIL CO., Coast Magnetics, 5333 W. Washington Blvd, Los Angeles, CA 90016, Tel: 213-936-6188, TELEX: 686103 AMI SPACE ASA; FSC No.: 05254; Empl.: 50

COASTCOM, P.O. Box 27068, Concord, CA 94527, Tel: 415-825-7500, TWX: 910-481-5781; FSC No.: 415 682-2015; Empl.: 100; *Sls. Mgr.:* Thomas M. Hresko, Nat'l. Dir. Sls.

COAX CONNECTION, 1736 Front St, Yorktown Hgts., NY 10598, Tel: 914-962-2303, 800-431-2103, FAX: 914-962-2296; FSC No.: 13-3289669 ..... **C•1308**

COAXIAL DYNAMICS, 15210 Industrial Parkway, Cleveland, OH 44135, Tel: 1-800-COAXIAL, FAX: 216-267-3142; Empl.: 40; *Sls. Mgr.:* R. J. Scott; *Dist. Mgr.:* J. R. Ittel

COAXITUBE CORP., 245 Naylor Mill Rd, Salisbury, MD 21801, Tel: 301-546-3911, FAX: 301-546-3913; Empl.: 10

COBER ELECTRONICS, 102 Hamilton Ave, Stamford, CT 06902, Tel: 203-327-0003, TWX: 710-474-3371, FAX: 203-359-6319; FSC No.: 28909; Empl.: 100; *Sls. Mgr.:* Saul Haffner

CODAR TECHNOLOGY, INC., 1500 Kansas Ave., Bldg. 2E, Longmont, CO 80501, Tel: 303-776-0472, TELEX: 4947090 Codar, FAX: 303-776-1806; Empl.: 60; *Sls. Mgr.:* D. Mac Donald

CODENOLL TECHNOLOGY CORP., 1086 N. Bwy., Yonkers, NY 10701, Tel: 914-965-6300, TELEX: 646159; Empl.: 104; *Sls. Mgr.:* Paul A. O'Brien; *Dist. Mgr.:* Paul A. O'Brien

CODY ELECTRONICS, INC., 2284-C Ringwood Ave., San Jose, CA 95131, Tel: 408-432-7570, FAX: 408-432-1891; Empl.: 30; *Sls. Mgr.:* Patrick Sargent

COGNITRONICS, 25 Crescent St., Stamford, CT 06906, Tel: 203-327-5307, TWX: 710-474-3523, FAX: 203-327-2002; Empl.: 140; *Sls. Mgr.:* Vincent Harrison

COHERENT COMMUNICATIONS SYS. CORP., 60 Commerce Dr., Hauppauge, NY 11788, Tel: 516-231-1550, TELEX: WUI 96-1439, FAX: 516-231-0018; Empl.: 150; *Sls. Mgr.:* William Hendrix

COHERENT GENERAL, INC., Picker Rd, Sturbridge, MA 01566, Tel: 508-347-2681, TELEX: 95-1806, FAX: 508-347-5134; Empl.: 200; *Sls. Mgr.:* William H. Shiner

COHERENT, INC., P.O. Box 10321, Palo Alto, CA 94303, Tel: 415-493-2111, TELEX: 34-8304, FAX: 415-493-1566; Empl.: 1625; *Sls. Mgr.:* Paul Crosby

COHU, INC., Elctrns. Div., 5755 Kearny Villa Rd., San Diego, CA 92123, Tel: 619-277-6700, TELEX: 910-335-1244, FAX: 619-277-0221; FSC No.: 05157; Empl.: 165; *Sls. Mgr.:* Jeff Tyler

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Local Sales Offices & Reps

AZ	Lake Havasu City, T. J. Mktg.	602-453-3233
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KS	Olathe, Advanced Tech. Sls.	913-782-8702
MA	Braintree, Coilcraft	617-848-9194
MI	Clark Lake, Dick Trull	517-529-9285
MO	St. Louis, Advanced Tech. Sls.	314-878-2921
NC	Raleigh, Rick Burns Assoc.	919-876-2224
TX	El Paso, Coilcraft	915-592-7891
VA	Lynchburg, M & S Mfg. Svcs.	801-272-5643
WA	Kirkland, DMI, Inc.	206-823-4798
Can	Oakville, Ont., Haltronics	800-387-7955

COIL-Q CORP., 340 Bronxville Rd., Bronxville, NY 10708, Tel: 914-337-4775; Empl.: 12

COIL WINDING EQUIPMENT CO., R.R. Plaza, P.O. Box 660, Oyster Bay, NY 11771, Tel: 516-922-5660, TELEX: 14-3128, FAX: 516-922-5029; Empl.: 25; *Sls. Mgr.:* Joseph Pizzonia

the Colber Corporation

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COLBER CORP., 26E Buffington St., Irvington, NJ 07111, Tel: 201-371-9500, TWX: 710-995-4416; Empl.: 50; *Sls. Mgr.:* Roberta Bryner ..... **A•1920-1921**

Local Sales Offices & Reps

IN	Fort Wayne, Walter W. Bieberich	219-432-2537
TN	Fairview, Walter W. Bieberich	615-799-0120

COLE HERSEE CO., 20 Old Colony Ave., Boston, MA 02127-2467, Tel: 617-268-2100, TELEX: 94-0901, FAX: 617-268-9490; *Sls. Mgr.:* Wesley L. Peterson

COLE INSTRUMENT CORP

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COLE INSTRUMENT CORP., 2650 S. Croddy Way, Santa Ana, CA 92704, Tel: 714-556-3100, TELEX: 678421; FSC No.: 31946; Empl.: 60; *Sls. Mgr.:* P. Hanson ..... **B•1702**

Local Sales Offices & Reps

AL	Huntsville, Brandel-Stephens	205-883-0445,
AZ	Scottsdale, Advent Comps.	602-481-0044
CA	Anaheim, Gabriel & Assocs.	714-666-0660
FL	Deerfield Bch., Brandel-Stephens	305-427-5441,
FL	Orlando, Brandel-Stephens	305-427-5441,
GA	Atlanta, Brandel-Stephens	404-261-7579,
IN	Ft. Wayne, Naunas Sls. Co.	219-432-4792,
MD	Gaithersburg, Carwithen Assocs.	301-921-9545,
MA	Norwood, Tom Maguire & Assocs.	617-551-0500,
MN	Minneapolis, Design Technlg. Inc.	612-424-7605,
MO	St. Louis, Harris & Hanson	314-432-3611
NY	Scottsville, Floring & Assocs., Inc.	716-889-4614,
NC	Greensboro, Brandel-Stephens	919-274-6952,
PA	West Chester, TCA	215-692-6853,
TX	Dallas, Control Components Inc.	214-458-8877

COLLINS AVIONICS DIVISIONS, Rockwell Intl, 400 Collins Rd. NE, Cedar Rapids, IA 52498, Tel: 319-395-1000, TELEX: 464-421, TWX: 910-525-1321; Empl.: 4,325; *Sls. Mgr.:* R.N. Thorpe

Collmer Semiconductor

FAX: 214-233-0481

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Local Sales Offices & Reps

CA	Playa Del Rey, Corcoran Assocs.	213-823-4589
TX	Dallas, Collmer Semiconductor Inc.	800-527-0251
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IN	Greenwood, Arete Sls. Inc.	317-882-4407
KS	Lenexa, Midtec Assocs., Inc.	913-541-0505
CA	S. Mission Viejo, Collmer Semiconductor Inc.	714-582-2188
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CA	San Jose, Comtech Mktg.	408-294-5445
MO	St. Louis, Midtec Assocs., Inc.	314-275-8666
NJ	Nutley, Falk-Baker Assocs.	201-661-2430
NY	Clark Mills, KLM Garner	315-853-6126
NY	Pittsford, KLM Garner	716-381-8350
NC	Cary, Tec Rep Svcs., Inc.	919-467-6444
NC	Charlotte, Tec Rep Svcs. Inc.	704-342-3900
OH	Beachwood, Elctrn. Salesmasters	216-831-9555
OR	Portland, Elctrn. Engrg. Sls.	503-639-3978
PA	Hatboro, Electro Rep	215-674-4421
RI	Cumberland, Omni-Rep	401-438-3423
TN	Brentwood, Tec Rep Svcs. Inc.	615-832-0449
CO	Golden, J. F. Hurlbut Co.	303-279-7796
TX	Austin, Barry Sls., Inc.	512-837-3616
TX	Houston, Barry Sls., Inc.	713-784-5860
CT	Madison, Omni-Rep	203-421-4561
FL	Oldsmar, Boggs & Assocs.	813-855-1812
TX	Richardson, Barry Sls., Inc.	214-234-0255
VA	Richmond, Glasscock Assocs.	804-740-0063
FL	W. Palm Bch., Boggs & Assocs.	305-478-8062
WA	Redmond, Elctrn. Engrg. Sls.	206-883-3374
WI	Waukesha, Electron Mktg. Corp.	414-547-1505
GA	Alpharetta, Tec Rep Svcs., Inc.	404-594-8973

Local Distributors

IN	Carmel, Altex Elctrns., Inc.	317-848-1323
IL	Chicago, NEP Elctrns., Inc.	312-625-8400

COLORADO CRYSTAL CORP.

FAX: 303-667-3500

COLORADO CRYSTAL CORP., 2303 W. 8th St., Loveland, CO 80537, Tel: 303-667-9248; FSC No.: 33096; Empl.: 105; *Sls. Mgr.:* David Lind ..... **A•1361-1363**

Local Sales Offices & Reps

CA	Calabasas, Shel Schreiber Assocs.	818-703-8083
CA	Los Altos, Kolm Mktg. Assoc.	415-948-2635
IA	Cedar Rapids, Barnes Midwest Sls.	319-393-9790
KS	Overland Park, Barnes Midwest Sls.	913-469-9688
MA	Randolph, Bengal	617-961-4120
OR	Beaverton, L. D. Elctrns.	503-649-6177
TX	Austin, Oeler & Menelaides	512-453-0275
TX	Dallas, Oeler & Menelaides	214-361-8876
TX	Houston, Oeler & Menelaides	713-682-7001
WA	Snohomish, L.D. Elctrns.	206-568-0511

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COLORADO VIDEO, INC., Box 928, Boulder, CO 80306, Tel: 303-530-9580, TWX: 910-940-3248, FAX: 303-530-9569; Empl.: 26; *Sls. Mgr.:* N. H. Bennett

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COLUMBIA RESCH. LABS., Macdade Blvd. & Bullens La., Woodlyn, PA 19094, Tel: 215-872-3900, TWX: 510-669-3625, FAX: 215-872-3882; FSC No.: 07571; Empl.: 95; *Sls. Mgr.:* Robert Hartzell

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CA	Anaheim, Westrep	213-404-3881
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CA	Santa Clara, Westrep	408-988-8833
CO	Littleton, Lange Sls., Inc.	303-795-3600
FL	Altamonte Springs, Semtronics	305-831-8233
FL	Clearwater, Semtronics	813-461-4675
GA	Norcross, Montgomery Mktg., Inc.	404-447-6124
IL	(Northern), Sumer, Inc.	312-991-8500
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IN	Indianapolis, Frank J. Compisano Co.	317-253-7651
IA	Cedar Rapids, S & O Sls.	319-363-7323
MD	Columbia, L. D. Lowery, Inc.	301-381-0225
MA	Chelmsford, J.E. Boeing Co.	508-256-5800
MI	Southfield, Rathsburg Assocs., Inc.	313-559-9700
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MO	Bridgetown, Cen Tech, Inc.	314-291-4230
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NC	Raleigh, Montgomery Mktg., Inc.	919-851-0010
OH	Cincinnati, Frank J. Campisano Co.	513-574-7111
OH	Cleveland, Components, Inc.	216-243-9200
OK	Tulsa, Ammon & Rizos Co.	918-749-6116
OR	Beaverton, Evergreen Mktg. Grp.	503-643-8020
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TX	Houston, Ammon & Rizos Co.	713-781-6240
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UT	Salt Lake City, Lange Sls., Inc.	801-487-0843
WA	Bothell, Evergreen Mktg. Grp.	206-485-8063
WI	Brookfield, Sumer, Inc.	414-784-6641
PR	Hato Rey, Semtronics	809-766-0700
Can	Hamilton, Ont., Cartwright/Southall Assocs., Inc.	416-528-0294
Can	Montreal, PQ, McIntyre Agencies Ltd.	514-731-9617

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MI	Livonia, RS Elctrns.	313-525-1155
MN	Minneapolis, Sterling Elctrns.	612-831-2666
NY	Buffalo, Summit Distrs., Inc.	716-887-2800
NY	Hauppauge, Arrow/Kierulff Elec. Grp.	516-231-1000
NY	Westbury, Schweber Elctrns.	516-334-7474
PA	Philadelphia, Almo Elctrns., Inc.	215-698-4000
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WA	Bellevue, Almac Elctrns. Corp.	206-643-9992
Can	Montreal, Que., Prelco Elctrns., Ltd.	514-389-8051
Can	Scarborough, Ont., Carsten Elctrns.	416-495-7705
Can	Willowdale, Ont., Electrosonic	416-494-1666

COMARK CORP., 93 West Street, Medfield, MA 02052, Tel: 508-359-8161, FAX: 508-359-2267; Empl.: 35

COMATEL USA, INC., 22 Eagle Rd., Commerce Pk., Danbury, CT 06810, Tel: 203-797-9445, TELEX: 643-011, FAX: 203-790-9298; *Sls. Mgr.:* Tim Papp

COMCAB, Wakefield National, Inc., 8255 Black Run Rd., Nashport, OH 43830, Tel: 614-828-2468, FAX: 614-828-2796; Empl.: 30; *Sls. Mgr.:* Susan Inderwish; *Dist. Mgr.:* Susan Inderwish

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MN	Minneapolis, Paul Ericson & Assocs., Inc.	612-831-5016
NY	Rochester, Just Right Elctrns.	716-442-2561
OH	Akron, Augnat Assocs.	216-273-1211
OH	Wadsworth, Communication Cables & Connectors	216-336-8780
OR	Tualatin, Nicor, Inc.	503-692-0421
WA	Redmond, Nicor, Inc.	206-885-3660

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Local Sales Offices & Reps

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CA	San Jose, Blue Elctrns. Sls.	408-248-4399
CO	Denver, Electrophase	303-296-0443
MA	Peabody, J-K Assocs.	508-535-8068
OR	Portland, SPS Elctrns.	503-297-6919
TX	Rockwall, Eatman Mfg. Rep.	214-771-1903

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CA	Stanton, Inductive Comps.	714-828-3420
CA	Sunnyvale, Target Elctrns.	408-734-5611
FL	Ft. Lauderdale, Savoy Elctrns.	800-327-1282

COMDATA CORP., 7900 N. Nagle Ave., Morton Grove, IL 60053, Tel: 312-470-9600, TELEX: 4931765

COMLINEAR CORP., 4800 Wheaton Drive, Fort Collins, CO 80525, Tel: 303-226-0500, TELEX: 45-0881; FSC No.: 62839; Empl.: 160; *Sls. Mgr.:* John Perzow; *Dist. Mgr.:* Bill Henderson

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Local Sales Offices & Reps

CA	Los Angeles, Richard Bolf	213-305-1025
IL	Palatine, Gregg Winn	312-705-9190
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NH	Nashua, Dan Heffernan	603-673-4908
GA	Atlanta, Larry Bushwick	404-436-1959
TX	Plano, Steve Britton	214-596-6065

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COMMUNICATIONS INSTRUMENTS, INC., P.O. Box 520, Hwy. 74 East, Fairview, NC 28730, Tel: 704-628-1711, TELEX: 577436, FAX: 704-628-1439; FSC No.: 58614; Empl.: 360; *Sls. Mgr.:* R. McClinton ..... **B•1444-1448**

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AZ	Phoenix, CPS Assocs.	602-246-1097
CA	Long Beach, R D & D Sls. Engrg.	213-988-1116
CA	Santa Clara, Ross Mktg.	408-988-8111
CT	Torrington, Phoenix Sls.	203-496-7709
FL	Oviedo, Conley & Assocs.	305-365-3283
GA	Atlanta, ElectroAir	404-351-3545
IL	Arlington Hts., MB Sls.	312-392-9499
IN	Ft. Wayne, Denton Mktg.	219-486-0665/1264
IA	Cedar Rapids, C. H. Horn & Assocs.	319-393-8703
KS	Lenexa, Midwest Tech. Sls.	913-888-5100
MD	Ellicott City, Doss Elctrns.	301-465-1336
MA	Needham, Component Technlg., Inc.	617-449-8490
MI	Grosse Pointe Park, Greiner Assocs., Inc.	313-499-0188
MN	North Mankato, El Sls.	507-345-5786
NY	East Rockaway, HLJ Comp. Tech.	516-599-2999
NY	Syracuse, M. M. Hare Co.	315-457-6859
NC	Raleigh, Godwin Assocs.	919-878-8000
OH	Cleveland, Arthur H. Baier Co.	216-461-6161
OH	Dayton, Arthur H. Baier Co.	513-276-4128
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AL	Huntsville, Time Elctrns.	205-721-1133
AZ	Tempe, Time Elctrns.	602-967-2000
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CA	Chatsworth, Time Elctrns.	818-998-7200
CA	San Diego, Time Elctrns.	619-586-1331
CA	Sunnyvale, Time Elctrns.	408-734-9888
CA	Torrance, Time Elctrns.	213-320-0880
CO	Englewood, Time Elctrns.	303-799-8851
CT	Cheshire, Time Elctrns.	203-271-3200
FL	Ft. Lauderdale, Time Elctrns.	305-974-4800
FL	Orlando, T & T Prods., Inc.	305-857-2282
FL	Orlando, Time Elctrns.	305-841-6565
GA	Norcross, Time Elctrns.	404-448-4448
IL	Wood Dale, Time Elctrns.	312-350-0610
MD	Columbia, Time Elctrns.	301-964-3090
MA	Peabody, Time Elctrns.	617-532-6200
MN	Bloomington, Time Elctrns.	612-532-1250
MO	St.Louis, Time Elctrns.	314-391-6444
NJ	Pine Brook, Time Elctrns.	201-582-4611
NY	E. Syracuse, Time Elctrns.	315-432-0355
NY	Hauppauge, Time Elctrns.	516-273-0100
NC	Charlotte, Time Elctrns.	704-522-7600
OH	Dublin, Time Elctrns.	614-761-1100
OR	Portland, Time Elctrns.	503-684-3780
PA	King of Prussia, Time Elctrns.	215-337-0900
TX	Austin, Time Elctrns.	512-339-3051
TX	Carrollton, Time Elctrns.	214-241-7441
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AL Huntsville, EMA Inc. 205-837-7363
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IN Greenwood, Valentine Assoc. 317-888-2260
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NJ Sicklerville, Brown & Assocs. 609-629-2254
NC Raliegh, EMA Inc. 919-847-8800
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VA Fairfax, Schibley Assocs. 703-591-3008

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COMPAR, D.G.W. Electronics Corporation, 85 Spy Ct., Markham, Ontario, Canada L3R 4Z4, Tel: 416-475-8500, TELEX: 06-966600, FAX: 416-475-4158; Empl.: 36; *Sls. Mgr.:* Tony Macina

COMPAS, 100 Chimney Point Dr., Ogdensburg, NY 13669, Tel: 315-393-3573, FAX: 315-393-7638; Empl.: 300; *Sls. Mgr.:* Edward Gilbert

COMPEX CORP., Taunton Professional Park, 238 Taunton Blvd., Medford, NJ 08055, Tel: 609-596-9388, FAX: 609-596-3482; Empl.: 24

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TX Dallas, Texas Avionics 214-363-6324
Can Neapean, Ont., Intrade Canada, Inc. 613-727-1272

COMPLIANCE DESIGN INC., 593 Massachusetts Ave., Boxboro, MA 01719, Tel: 617-264-4668, TWX: 317-632-DASH, FAX: 617-263-7086; *Sls. Mgr.:* Harry Davis

COMPONENT GENERAL, INC., 2445 Success Dr., Odessa, FL 33556, Tel: 813-376-6655, FAX: 813-372-9096; Empl.: 30; *Sls. Mgr.:* James A. Cook

Local Sales Offices & Reps

CA Palo Alto, Mollard Mktg. 415-961-0456
DC Washington, M. Lader Co. 202-296-2497
MA Andover, Bee Assoc. 508-475-2124
MN Minneapolis, Comstrand 612-788-9234
MO Grandview, R. R. Burton 816-763-5385
NY Buffalo, Ed Westgren Assoc. 716-632-0011
NY New Rochelle, Robert Diamond Inc. 914-632-2828
PA Conshohocken, M. Lader Co. 215-825-3177
PA Murrysville, Pittsburgh Sls. Assoc. 412-327-3268
TX Austin, Allied Comps., Inc. 512-331-4494
TX Dallas, Allied Comps., Inc. 214-238-0408
TX Ft. Worth, Allied Comps., Inc. 817-589-0456
EXP CT, New Canaan, Control Devices 203-966-7311

COMPONENT MFG. SVC., INC., 1 Component Park, W. Bridgewater, MA 02379, Tel: 508-580-0111, FAX: 508-559-9893; Empl.: 600; *Sls. Mgr.:* Scott Allen; *Dist. Mgr.:* Wayne Douglas ..... **C•1309**

COMPONENT RESEARCH CO. INC., 1655-26 St., Santa Monica, CA 90404, Tel: 213-829-3615, FAX: 213-829-9584; FSC No.: 12517;Multiple; Empl.: 230; *Sls. Mgr.:* Sylvia Kellerman ..... **A•1026-1064**

Local Sales Offices & Reps

SC Greenville, Walter Lamphier 803-232-4687

COMPONENTS CORP., 6 Kinsey Pl., Denville, NJ 07834, Tel: 201-627-0290, FAX: 201-361-5801; FSC No.: 26364; Empl.: 20; *Sls. Mgr.:* Fred Bielenberg .... **C•1311, 1616**

Local Sales Offices & Reps

CO Englewood, Hi-Tech Controls 303-771-0444
CA Tustin, Schoenbachler-Dobson Co. ... 714-544-1888
FL Orlando, EAB, Inc. 305-898-7444
MD Ellicott City, AM-Tech 301-461-5599
MN Hopkins, S. J. Collins & Assocs. 612-933-7661
MA Randolph, TMR Group 617-961-4486
OH Worthington, The Dynel Co. 614-436-9452
OR Beaverton, Cascade Sls. 503-626-7978
TX Dallas, deForest Sls. Co. 214-349-3290
EXP France, Charles Thayer 33-50.73.69.13
Can Brampton, Ont., T. W. Wilson Sls. 416-458-7327

Local Distributors

AZ Tempe, Control Design Supp. 602-829-7981
CA Anaheim, Bisco Inds. 714-635-0380
CA Anaheim, Control Design Supp. 213-802-2429
CA Los Angeles, Strassner Sls. Co. 213-242-8823
CA Manhattan Bch., Prime Electro Prods. 213-379-3642
CA San Carlos, Control Design Supp. 415-592-4808
CA San Jose, Bisco Inds. 408-435-8980
FL Altamonte Springs, Control Design Supp. 305-788-3220
GA Stone Mtn., Control Design Supp. 404-979-3502
IL Franklin Pk., Bisco Inds. 312-451-1230
IL Genoa, Control Design Supp. 815-784-6519
IN Indianapolis, Control Design Supp. 317-788-0551
IA Marion, Control Design Supp. 319-373-2923
MA Northboro, Papi Supp. Co. 617-393-3127
MA Woburn, Bisco Inds. 617-938-8590
MN Minneapolis, Control Design Supp. 612-721-1628
MO St. Louis, Control Design Supp. 314-426-3150
NJ Englewood, QC Elctrns. 201-569-0975
NY Mt. Vernon, QAR Indl. Elctrns. 914-699-2224
NC Charlotte, Control Design Supp. 704-588-4410
OH Centerville, Industrial Prods. Distbg. ... 513-435-2086
PA Malvern, Control Design Supp. 215-296-0150
TX Arlington, Bisco Inds. 817-640-7046
TX Dallas, Control Design Supp. 214-358-0489
WI New Berlin, Control Design Supp. 414-784-1016

COMPONENT SPECIALTIES CORP., 9143 E. La Rosa Dr., Temple City, CA 91780, Tel: 213-283-0015, FAX: 818-287-7189; FSC No.: 28984; Empl.: 45; *Sls. Mgr.:* D.R. Heins

COMPONENTS UNLIMITED, INC., 12140 SW Garden Pl., Portland, OR 97223, Tel: 503-620-3522, FAX: 503-684-5428; Empl.: 25; *Sls. Mgr.:* Jim Seiler; *Dist. Mgr.:* R. Trever Dougan

COMPUCART, Versa Tec, 107 N. Rome Ave., Tampa, FL 33606, Tel: 800-237-9024, 813-251-2431; Empl.: 25

COMPU-MECH INC., 2375 Dorr St., Toledo, OH 43607, Tel: 419-535-6702, TWX: 510-601-7362, FAX: 419-535-0805; *Sls. Mgr.:* John Stanley III

COMPUMOTOR CORPORATION, 1179 N. McDowell Blvd., Petaluma, CA 94952, Tel: 707-778-1244

COMPUTALKER, Compuvoice, Inc., 1119 Colorado Ave., Ste. 115, Santa Monica, CA 90401, Tel: 213-393-7781; Empl.: 1; *Sls. Mgr.:* Lloyd Rice; *Dist. Mgr.:* Lloyd Rice

COMPUTER AVIONICS, See CAC Microcircuits, Inc.

COMPUTER CABLE & PRODS., INC., Vertex Computer Cable & Products

COMPUTER COMPONENTS INC.

FAX: 914-738-6706

COMPUTER COMPONENTS, INC., 629 Fifth Ave., Pelham, NY 10803, Tel: 914-738-1611; FSC No.: 12965; Empl.: 25; *Sls. Mgr.:* John Hunsicker; *Dist. Mgr.:* John Hunsicker ..... **B•1449**

COMPUTER CONVERSIONS CORP., 6 Dunton Ct., E. Northport, NY 11731, Tel: 516-261-3300, TWX: 510-226-0448, FAX: 516-261-3308; FSC No.: 51086; Empl.: 100; *Sls. Mgr.:* S. J. Renard ..... **D•1158-1159**

Local Sales Offices & Reps

CA Granada Hills, Crown Elctrns. 213-877-3550
CA San Carlos, Cymatix 415-592-8076
IL Hoffman Estates, Bu-Nell Engrg. Co. .. 312-843-8600
IN Mishawaka, Engrd. Sls. 219-255-5111
IA Hoffman Estates, Bu-Nell Engrg. 312-843-8600
MA Brookline, Technology Prod. Grp. 617-731-0858
MI Newport, Industrial Sensors, Inc. 313-289-3374
NM Albuquerque, Fry-Gates 505-262-1525
NY Moravia, Electrotech Sys. 315-497-1598
NC Kanapolis, Bass & Assocs. 704-933-1762
OH Cincinnati, Rilco 513-271-0630
PA Ingoma, Greye Glass 412-366-6864
TX Lewisville, Automated Dynamics 214-221-0052

COMPUTER DEVICES, 34 Linnell Cir., Nutting Lake, MA 01865, Tel: 508-663-4980, TELEX: 949398; Empl.: 30; *Sls. Mgr.:* Sandra R. Clark

COMPUTER DOCTORS, 9204-B Baltimore Blvd., College Park, MD 20740, Tel: 1-800-RAM-STAR, 301-474-3095

COMPUTER DYNAMICS SALES, 107 S. Main St., Greer, SC 29651, Tel: 803-877-8700, FAX: 803-879-2030; *Sls. Mgr.:* Barry Steele

COMPUTER INSTRUMENTS DIV., 100 Madison Ave., Hempstead, NY 11550, Tel: 516-483-8200, TWX: 510-222-4189, FAX: 516-483-8327; Empl.: 50; *Sls. Mgr.:* B. Peskin

COMPUTER MAINTENANCE CORP., 405 Murray Hill Pkwy, East Rutherford, NJ 07073, Tel: 201-896-0707, FAX: 201-896-8503; Empl.: 105; *Sls. Mgr.:* Arthur Young

FAX: 818-882-0492

COMPUTER OPTICAL PRODUCTS, INC., Sub. of Hathaway Corp., 9321 Eton Ave., Chatsworth, CA 91311-6910, Tel: 818-882-0424, TELEX: 18-33-73-UD; Empl.: 50; *Sls. Mgr.:* David Richards ..... **B•1942**

Local Sales Offices & Reps

AL Huntsville, DHR Mktg., Inc. 205-722-0440
AZ Scottsdale, Bill Earl Assoc., Inc. 602-994-3813
CA El Toro, SDK & Assocs., Ltd. 714-855-9881
CA Englewood, Dynatech, Inc. 303-773-2830
CA Santa Clara, Fahmer Miller Assoc., Inc. 408-727-9800
CT Waterbury, Underwood Sls. Corp. 508-256-8191

FL Tampa, DHR Mktg., Inc. 407-740-7940
GA Duluth, DHR Mktg., Inc. 404-564-0529
IL Addison, Vikeland Sls., Inc. 312-832-8426
ME Lowell, Underwood Sls. Corp. 508-256-8191
MI Brighton, A.P. Assocs., Inc. 313-229-6550
MN St. Paul, Vikeland Sls., Inc. 612-645-4647
NY Sidney, Southern Tier Equip. 607-563-8978
NC Raleigh, DHR Mktg., Inc. 919-829-1970
OH Cincinnati, Stegman Blaine Mktg. 513-729-1969
OR Portland, General Elctrns. 503-297-8500
PA Philadelphia, Homersmith, Inc. 215-543-2434
SC Greenville, DHR Mktg., Inc. 803-235-3594
TN Nashville, DHR Mktg., Inc. 615-331-2745
TX Dallas, R.F. Kimball Co., Inc. 214-231-3447
VA Richmond, DHR Mktg., Inc. 804-359-8803
WI Waukesha, Vikeland Sls., Inc. 414-782-1133

COMPUTER PERIPHERALS INC., 667 Rancho Congo Blvd., Newbury Pk., CA 91320, Tel: 805-499-5751, 800-854-7600, TELEX: 759299CPI, FAX: 805-498-8848; Empl.: 100; *Sls. Mgr.:* Davius Antia; *Dist. Mgr.:* Mike Krunic

COMPUTER POWER INC., 124 W. Main St., High Bridge, NJ 08829, Tel: 201-638-8000, 800-526-5088, TELEX: 847481, FAX: 201-638-4931; FSC No.: 3643; Empl.: 200; *Sls. Mgr.:* J. Robert Hoeffler; *Dist. Mgr.:* J. Robert Hoeffler

Local Sales Offices & Reps

AL Huntsville, FM Assocs. 205-882-0689
AZ Xcottsdale, Williams Assocs. 602-947-4297
AR El Dorado, Kemp Engrg. 501-862-5869
CA Santa Clara, Manco 408-496-6611
CO Commerce City, Williams Assocs. 303-289-5647
CT Manchester, J&J Assocs. 203-645-8312
FL Orlando, FM Assocs. 407-851-5710
GA Norcross, FM Assocs. 404-446-0033
IL Park Ridge, Conrardy Co. 312-692-2226
IN Fishers, Carter McCormic & Pierce ... 317-842-9277
IA Des Moines, Beams 515-255-1148
KS Shawnee Mission, The Beams Co. 913-631-0300
LA Chalmette, Power Products Inc. 504-254-0851
MD Linthicum, KD Assocs. 301-859-5151
MD Towson, HL Frey Corp. 301-821-0058
MA Winchester, J&J Assocs. 617-729-5770
MI Farmington Hills, Carter McCormic & Pierce 313-477-7700
MO St. Louis, The Beams Co. 314-434-8448
NM Albuquerque, Williams Assocs. 505-255-1638
NC High Point, FM Assocs. 919-884-3939
OH Berea, Carter McCormic & Pierce 216-826-0400
OH Englewood, Carter McCormic & Pierce 513-836-0951
OK Tulsa, Kemp Engrg. 918-663-4501
OR Portland, Controltex Inc. 503-641-0876
PA Pittsburgh, Carter McCormic & Pierce 412-826-3800
PA Wayne, Mahar Assocs. 215-687-5350
TX Addison, Kemp Engrg. Inc. 214-931-7100
UT Salt Lake City, Williams Assocs. 801-486-6511
VA Richmond, Computer Environmental II 804-264-2528

Local Distributors

AL Hueytown, S&W Minicomputer Inc. 205-491-7777
AK Bethel, Basic Business Svcs. 907-543-3140
AZ Phoenix, Aspen Power Inc. 5602-937-4784
AZ Phoenix, Keystone Electro Sls. 602-995-3005
AR Springdale, Nelson Elec. Supp. Co. 501-751-5471
CA Brisbane, FYE Medical 415-468-1430
CA San Francisco City, Elec. Supp. 415-864-3888
CA San Mateo, Elesco 415-347-7721
CO Commerce City, Waco Elctrns. 303-289-5647
FL Boca Raton, Escom 305-994-4446
FL Miami, Advanced Network Prods. 305-891-2058
FL Miami, Alpeco Intl. 305-592-2985
FL Miami, Power Place 305-885-6746
FL Orlando, Veytec Inc. 305-849-6391
FL St. Petersburg, Comp/Power 813-866-0649
GA Clarkston, Power Place 404-299-1220
GA Tucker, Veytec 404-496-0989
IL Chicago, Thomas Computer 312-647-0880
IL Park Ridge, Condisco 312-692-2226
KS Cimarron, Resources Unltd. 316-855-3244
MD Landover, Generator Sys. Inc. 301-322-4777
NH Londonderry, Power Sys. Dist. 603-434-2371
NJ Eatontown, Syntrex 201-542-1500
NY Hauppauge, Manchester Equip. 516-435-1199
NC Wilkesboro, Interconnect Prods. Svc. .. 919-667-3356
OH Defiance, Northwest Elec. Control 419-782-9479
OR Beaverton, Micro Power Elctrns. 503-626-7086
OR Bellevue, North Coast Elec. 503-281-8888
OR Portland, North Coast Elec. 503-228-5111
PA Camp Hill, Diversified Data 717-761-0670
PA Seneca, Seneca Chemical & Supp. ... 814-676-1222
RI Newport, AP Sys. 401-847-6472
TN Hendersonville, Indl. Battery 615-525-2941
TN Westmoreland, Radco 615-841-3276
TX Euless, Power Place 817-267-3202
TX Houston, Professional Tool Box 713-789-5215
TX Rockdale, K&K Elctrns. 512-446-3773
TX San Antonio, Computer Room Technlgs. 512-675-3117
TX Stafford, Timers & Controls Inc. 713-240-4610
UT West Valley City, ESP Plus Inc. 801-973-8904
VA Richmond, Chappel Agy. 804-288-3621

COMPUTER PRODUCTS, INC., Measurement & Control Div., 2900 Gateway Dr., Pompano Beach, FL 33069, Tel: 305-974-5500, TELEX: 510-956-9895; Empl.: 170

COMPUTER PRODUCTS™
POWER CONVERSION

FAX: 415-683-6452

COMPUTER PRODUCTS INC., Power Conversion, 3785 Spinnaker Ct., Fremont, CA 94538, Tel: 415-657-9837; FSC No.: 62125; Empl.: 2000; *Sls. Mgr.:* Norm S. Berkowitz, Pres. PCA Sls.; *Dist. Mgr.:* Edward N. Bennett, Dir. Distbn. Opers. ..... **D•1536, 1683-1701**

Local Sales Offices & Reps

AZ Scottsdale, Summit Sls. 602-998-4850
CA Santa Ana, Jones & McGeoy Sls. 714-547-6466
CA Santa Clara, Criterion Sls. 408-988-6300
CO Aurora, Electrodyne 303-695-8903
CT New Milford, Alpha-Omega Sls. 203-354-2923
FL Oviedo, Conley & Assocs. 407-365-3283
IL Itasca, Janus, Inc. 312-250-9650
IN Indianapolis, SAI Mktg. Corp. 317-545-1010
KS Leawood, Dy-tronix, Inc. 913-339-6333
KS Wichita, Dy-tronix, Inc. 316-838-0884
MD Cloumbia, Third Wave Solutions, Inc. 301-290-5990
MA North Reading, Alpha Omega Sls. 508-664-1118
MI Fenton, SAI Mktg. Corp. 313-750-1922
MN Minneapolis, Stan Clothier Co. 612-944-3456
MO Bridgeton, Dy-tronix, Inc. 314-291-4777
NM Albuquerque, Summit Sls. 505-345-5003
NY Binghamton, Empire Tech. Assocs. ... 607-772-0651
NY Rochester, Empire Tech 719-381-8500
NY Skaneateles, Empire Tech 315-685-5703
NC Raleigh, Zucker Assocs., Inc. 919-782-8433
OH Columbus, SAI Mktg. Corp. 614-451-0778
OH Dayton, SAI Mktg. Corp. 513-435-3181
OH Warrensville Hgts., SAI Mktg. Corp. 216-591-0530
OK Tulsa, Ammon & Rizos 918-749-6116
OR Beaverton, Micro Sls., Inc. 503-645-2841
PA Erdenheim, Omni Sls., Inc. 215-233-4600
TX Austin, Ammon & Rizos 512-454-5131
TX Houston, Ammon & Rizos 713-781-6240
TX Richardson, Ammon & Rizos 214-644-5591
UT Salt Lake City, Electrodyne, Inc. 801-264-8050
WA Bellevue, Micro Sls., Inc. 206-451-0568
WI Waukesha, Janus, Inc. 414-542-7575
Can Etobicoke, Que., Bytewide Mktg., Inc. .. 416-675-1868
Can Ottawa, Ont., Bytewide Mktg. 613-728-0031
Can West Vancouver B.C., Blakewood Elctrns. Sys., Inc. 604-261-8099

Local Distributors

AL Huntsville, Bell Inds. 205-837-1074
AL Huntsville, Marshall Inds. 205-881-9235
AL Huntsville, Schweber Elctrns. 205-895-0480
AZ Phoenix, Marshall Inds. 602-496-0290
AZ Phoenix, Schweber Elctrns. 602-997-4874
AZ Tempe, Anthem 602-966-6600
AZ Tempe, Bell Inds. 602-996-7800
CA Canoga Park, Schweber Elctrns. 818-999-4702
CA Chatsworth, Anthem 818-700-1000
CA Chatsworth, Marshall Inds. 818-407-4100
CA El Monte, Marshall Inds. 818-459-5500
CA Garden Grove, Bell Inds. 714-895-7801
CA Gardena, Bell Inds. 213-515-1800
CA Irvine, Anthem/Lionex 714-768-4444
CA Irvine, Marshall Inds. 714-458-5301
CA Irvine, Schweber Elctrns. 714-863-0200/213-537-4321
CA Los Angeles, Bell Inds. 213-826-6778
CA Milpitas, Marshall Inds. 408-943-4600
CA N. Hollywood, B. J. Wolfe Entprs. 213-877-5518
CA Rocklin, Bell Inds. 916-969-3100
CA Sacramento, Anthem 916-624-9744
CA Sacramento, Schweber Elctrns. 916-929-9732
CA San Diego, Anthem 619-453-9005
CA San Diego, Bell Inds. 619-268-1277
CA San Diego, Marshall Inds. 619-578-9600
CA San Diego, Schweber Elctrns. 619-450-0454
CA San Jose, Anthem 408-295-4200
CA San Jose, B.J. Wolfe Entprs. 408-371-3443
CA San Jose, Schweber Elctrns. 408-432-7171
CA Sunnyvale, Bell Inds. 408-734-8570,408-773-1100
CA Thousand Oaks, Bell Inds. 805-499-6821
CO Englewood, Anthem 303-790-4500
CO Englewood, Schweber Elctrns. 303-799-0258
CO Thornton, Marshall Inds. 303-451-8383
CO Wheat Ridge, Bell Inds. 303-424-1985
CT Meriden, Anthem 203-237-2282
CT Oxford, Schweber Elctrns. 203-264-4700
CT Wallingford, Marshall Inds. 203-265-3822
FL Altamonte Springs, Marshall Inds. 407-767-8585
FL Altamonte Springs, Schweber Elctrns. 407-331-7555
FL Deerfield Bch., Bell Inds. 305-421-1997
FL Ft. Lauderdale, Marshall Inds. 305-977-4880
FL Largo, Bell Inds. 813-541-4434
FL Ovieda, Aztech Elctrns. 407-365-2241
FL Pompano Bch., Schweber Elctrns. 305-977-7511
FL St. Petersburg, Marshall Inds. 813-576-1399
GA Norcross, Bell Inds. 404-662-0923
GA Norcross, Marshall Inds. 404-923-5750
GA Norcross, Schweber Elctrns. 404-449-9170
IL Elk Grove, Bell Inds. 312-640-1910
IL Elk Grove, Schweber Elctrns. 312-364-3750
IL Elk Grove Vl., Anthem 312-640-6066
IL Schaumburg, Marshall Inds. 312-490-0155
IL Urbana, Bell Inds. 217-328-1077
IN Ft. Wayne, Bell Inds. 219-424-3422
IN Indianapolis, Bell Inds. .. 317-875-8200,317-299-5487
IN Indianapolis, Marshall Inds. 317-297-0483
IA Cedar Rapids, Bell Inds. 319-395-0730
IA Cedar Rapids, Schweber Elctrns. 319-373-1417
KS Lexena, Marshall Inds. 913-492-3121
KS Overland Park, Schweber Elctrns. 913-492-2922
MD Columbia, Anthem 301-995-6640
MD Columbia, Aztech Elctrs. 301-995-6800
MD Gaithersburg, Marshall Inds. 301-840-9450
MD Gaithersburg, Schweber Elctrns. 301-840-5900
MA Andover, Bell Inds. 508-474-8880
MA Bedford, Schweber Elctrns. 617-275-5100
MA Wilmington, Anthem 617-657-5170
MA Wilmington, Jaco Elctrns. 617-273-1860
MA Wilmington, Marshall Inds. 617-658-0810
MI Ann Arbor, Bell Inds. 313-971-9093
MI Livonia, LWC Distrs. 313-464-7700
MI Livonia, Marshall Inds. 313-525-5850
MI Livonia, Schweber Elctrns. 313-525-8100
MN Edina, Schweber Elctrns. 612-941-5280
MN Plymouth, Marshall Inds. 612-559-2211
MO Bridgeton, Marshall Inds. 314-291-4650
MO Earth City, Schweber Elctrns. 314-739-0526
NH Hudson, Bell Inds. 603-882-1133
NH Manchester, Schweber Elctrns. 603-625-2250
NJ Fairfield, Anthem 201-227-7960
NJ Fairfield, Marshall Inds. 201-882-0320
NJ Fairfield, Schweber Elctrns. 201-227-7880
NJ Mt. Laurel, Marshall Inds. 609-234-9100
NM Albuquerque, Bell Inds. 505-292-2700
NY Farmingdale, Bell Inds. 516-752-9303
NY Hauppauge, Anthem 516-273-1660
NY Hauppauge, Marshall Inds. 516-273-2424
NY Johnson City, Marshall Inds. 607-798-1611
NY Rochester, Marshall Inds. 716-235-7620
NY Rochester, Schweber Elctrns. 716-424-2222
NY Westbury, Schweber Elctrns. 516-334-7474
NC Raleigh, Century Elctrns. 919-782-2116
NC Raleigh, Marshall Inds. 919-878-9882
NC Raleigh, Schweber Elctrns. 919-876-0000
OH Beachwood, Schweber Elctrns. 216-464-2970
OH Dayton, Bell Inds. 513-434-8231
OH Dayton, Marshall Inds. 513-898-4480
OH Dayton, Schweber Elctrns. 513-439-1800
OH Solon, Marshall Inds. 216-248-1788
OH Westerville, Marshall Inds. 614-891-7581
OK Tulsa, Norvell Elctrns. 918-254-8606
OK Tulsa, Schweber Elctrns. 918-622-8000
OR Beaverton, Almac Elctrns. 503-629-8090
OR Beaverton, Anthem 503-643-1114
OR Beaverton, Marshall Inds. 503-644-5050
OR Lake Oswego, Bell Inds. 503-635-6500
PA Horsham, Anthem 215-443-5150
PA Horsham, Schweber Elctrns. 215-441-0600
PA Norristown, Century Elctrn. Comps. ... 215-631-5400
PA Pittsburg, Schweber Elctrns. 412-963-6804
PA Pittsburgh, Marshall Inds. 412-963-0441
TX Austin, Marshall Inds. 512-837-1991
TX Austin, Norvell Elctrns. 512-837-5555
TX Austin, Schweber Elctrns. 512-339-0088
TX Carrollton, Marshall Inds. 214-233-5200
TX Dallas, Norvell Elctrns. 214-233-0020
TX Dallas, Schweber Elctrns. 214-661-5010
TX Houston, Marshall Inds. 713-895-9200
TX Houston, Norvell Elctrns. 713-777-1666
TX Houston, Schweber Elctrns. 713-784-3600
TX Richardson, Bell Inds. 214-690-0466
UT Salt Lake City, Anthem 801-973-8555
UT Salt Lake City, Bell Inds. 801-255-2477
UT Salt Lake City, Marshall Inds. 801-485-1551
WA Bellevue, Almac Elctrns. 206-643-9992
WA Bellevue, Bell Inds. 206-885-9963

WA Bothell, Marshall Inds. 206-747-9100
WA Redmond, Anthem 206-881-0850
WA Spokane, Almac Elctrns. 509-924-9500
WI New Berlin, Schweber Elctrns. 414-784-9020
WI Waukesha, Bell Inds. 414-547-8879
WI Waukesha, Marshall Inds. 414-797-8400
Can Brampton, Ont., Zentronics 416-451-9600
Can Calgary, Alta., Future Elctrns. 403-235-5325
Can Downsview, Ont., Future Elctrns. 416-638-4771
Can Edmonton, Alta., Future Elctrns. 403-438-2858
Can Montreal, Que., Zentronics 514-737-9700
Can Ottawa, Ont., Future Elctrns. 613-820-8313
Can Pointe Claire, Que., Future Elctrns. 514-694-7710
Can Richmond, B.C., Zentronics 604-273-5575
Can Saskatoon, Saskatchewan, Zentronics 306-955-2202
Can Ste. Foy, Que., Future Elctrns. 418-682-5775
Can Vancouver, B.C., Future Elctrns. 604-294-1166
Can Winnipeg, Mani., Future Elctrns. 204-786-7711
Can Winnipeg, Mani., Zentronics 204-694-1957

COMPUTER SYSTEM ASSOCS., 7564 Trade St, San Diego, CA 92121, Tel: 619-566-3911, TELEX: 333693, FAX: 619-566-0581; Empl.: 15; *Sls. Mgr.:* Bill Reed; *Dist. Mgr.:* Bill Reed

COMPUTER SYSTEM PRODUCTS, 14305 21st Ave. N., Minneapolis, MN 55447, Tel: 612-476-6866, 800-422-2537, FAX: 612-476-6966; Empl.: 50; *Sls. Mgr.:* Tom Quanbeck; *Dist. Mgr.:* Tom Quanbeck

COMPUTERWARE, INC., 8480-I Tyco Rd., Vienna, VA 22180, Tel: 703-821-8200, FAX: 703-821-1746; Empl.: 18; *Sls. Mgr.:* John Dargo

COMPUTERWISE, 302 N. Winchester, Olathe, KS 66062, Tel: 913-829-0600, TELEX: 705337, FAX: 913-829-0810; Empl.: 20; *Sls. Mgr.:* William W. Brown; *Dist. Mgr.:* William W. Brown

COMPUTROL:AN AEG CO., 239 Ethan Allen Hwy., Ridgefield, CT 06877, Tel: 203-431-2000, TELEX: 643358, FAX: 203-431-2090; Empl.: 91; *Sls. Mgr.:* C. R. Wolfe

COMPUTRON DISPLAY SYSTEMS, Xcel Corporation, 3100 New York Drive, Pasadena, CA 91107, Tel: 818-791-5600, FAX: 818-791-9788; FSC No.: 07126; Empl.: 300; *Sls. Mgr.:* R. Van Horn; *Dist. Mgr.:* Kathy Privett ..... **B•1053**

COMSPEC DIGITAL PRODUCTS INC., 2313 W. Sam Houston Pkwy. N.S. 145, Houston, TX 77043, Tel: 713-461-4487, FAX: 713-461-8846; Empl.: 15; *Sls. Mgr.:* T. A. Paine; *Dist. Mgr.:* T. A. Paine

comstron corporation

FAX: 516-756-1167

COMSTRON CORP., 10 Hub Dr., Melville, NY 11747, Tel: 516-756-1100, TWX: 310-497-3525; Empl.: 120; *Sls. Mgr.:* William J. Meditz ..... **A•1365, 1691; D•1236**

Local Sales Offices & Reps

AL Huntsville, Saber Assoc. 800-327-0853
AZ Phoenix, Odyssey I 602-246-8846
CA Anaheim, Blair Assocs. 714-220-1201
CA Santa Clara, Ward Davis Assocs. 408-245-3700
CA Woodland Hills, Southern CA Tech. Sls. 818-704-9087
CO Denver, Odyssey I 602-246-8846
FL Melbourne, Saber Assocs. 800-327-0853
KS Lenexa, Dytec South 913-888-0215
MD Rockville, Creative Mktg. 301-251-4100
MD Rockville, Creative Mktg. Assocs. 301-251-4100
MN New Hope, Baltz Assocs. 612-546-8520
MO Maryland Hgts., Dytec South 314-739-0665
NJ Teaneck, Sci. Dvcs. East 201-837-1004
NM Albuquerque, Odyssey I 602-246-8846
NY Melville, Carnes Assocs. 516-694-1600
NY Whitney Pt., TAE-Rep 607-692-3705
PA Horsham, Eastern Instrumentation of PA 215-355-7700
PA Springhouse, Eastern Instrumentation of PA 215-355-7700
Can Ottawa, Ont., AIM Elctrns. 613-722-8286

COMTECH MICROWAVE CORP., Comtech Corp., 63 Oser Ave., Hauppauge, NY 11788, Tel: 516-435-4646, TELEX: 221-234 CMTCH; FSC No.: 31196; *Sls. Mgr.:* J. Tardi

COM/TECH SYSTEMS, INC., 10 Halyard Rd., Valley Stream, NY 11581-2813, Tel: 516-791-1175; Empl.: 10

COMTEC INFORMATION SYSTEMS, INC., 53 John St., Cumberland, RI 02864, Tel: 401-724-8500, TWX: 710-387-1171; Empl.: 60; *Sls. Mgr.:* R. A. Hamilton

COM-2, INC., 1556 Woodland Dr., Saline, MI 48176, Tel: 313-429-9027, FAX: 313-429-1902; Empl.: 70; *Sls. Mgr.:* Sande Strieter

CONAP, INC., 1405 Buffalo St, Olean, NY 14760, Tel: 716-372-9650, TWX: 510-245-2769; Empl.: 130

CONCEPT INDUSTRIES, App-Rep, Inc., 3641 San Gabriel River Pkwy., Pico Rivera, CA 90660, Tel: 213-699-0918, 800-255-2666, FAX: 213-692-8947; Empl.: 25; *Sls. Mgr.:* Rosemary Martinez; *Dist. Mgr.:* Kathy Sawyer

CONCORD ELECTRONICS CORPORATION, 30 Great Jones St., New York, NY 10012, Tel: 1-212-777-6571, TWX: 710-581-4930, FAX: 1-212-995-0161; FSC No.: 18310; Empl.: 225; *Sls. Mgr.:* Josie Wheaton ..... **C•1312-1313, 1617**

Local Distributors

AL Huntsville, Century Fasteners 205-883-5344
AZ Tucson, PSN Distrbn. 602-623-9800
AR Little Rock, Carlton-Bates 501-562-9100
CA Mission Hills, Coast Air 818-898-2288
CA San Jose, Bisco 408-996-8420
CO Denver, CSID/Integrated 303-292-5538
CT Danbury, Heilind 208-797-8600
DE New Castle, Electronics Exchange 302-322-5401
FL Sanford, Electronic Fasteners 407-321-4000
GA Norcross, Atlanta Hardware Specialty 404-449-3000
HI AIEA, Newark Elctrns. 808-487-8951
ID Coeurd' Alene, A-I Consolidated 208-765-3280
IL Franklin Park, Bisco 312-451-1230
IN Indianapolis, Mar Elctrns. 317-633-6699
IA Cedar Rapids, Dee Elctrns. 319-365-7551
KS Wichita, RSC Elex 216-267-5213
KY Bowling Green, Crescent Elctrns. 502-842-2444
LA New Orleans, Radio Pts. 504-581-5959
MD Gaithersburg, MS Elctrns. 301-921-0200
MA Billerica, MS Inserts 508-670-5600
MI Farmington Hills, Advent Elctrns. 313-477-1650
MN New Brighton, Chris ELctrns. 612-631-2647
MS Jackson, Newark Elctrns. 601-956-3834
MO St. Charles, Finnegan Elctrns. 314-946-6201
NE Omaha, Omaha Elctrns. 402-341-3440
NV Reno, Richco 702-323-4939
NH Nashua, Brevan 603-889-7230
NJ Kenilworth, Federated Purchasers 201-272-0505
NM Albuquerque, Electronic Pts. 505-293-6161
NY Bohemia, Car-Lac 516-567-4200
NC Raleigh, Century Elec. Comp. 919-782-2116
OH Dayton, Stotts-Friedman 513-298-5555
OK Tulsa, Altair 918-252-5781
OR Beaverton, Comp. Resources 503-641-8488
PA Philadelphia, PEI Genesis 215-673-0400
RI Pawtucket, Major Edwards 401-725-7400
SC Charleston, Wholesale Indl. Elex 803-577-6388
TN Knoxville, Industrial Elect 615-573-7135
TX Richardson, Aero Glen 214-234-0984
UT Salt Lake City, Kimball Elctrns. 801-328-2075
VT Colchester, Hooker Elctrns. 802-864-0885
VA Springfield, Southern Fasteners 703-922-8048
WA Redmond, Olander 206-881-3488
WV Beckley, State Elec. 304-256-2219
WI Grafton, Lakeview Elex 414-377-8250
EXP Taipei, Taiwan, Gold-Tek Elec. Co. 20-717-2302
Can Mississauga, Ont., Rush Elctrns. 416-677-7280

The Condenser Products Corporation

FAX: 904-799-0221

CONDENSER PRODUCTS CORP., 2131 Broad St, Brooksville, FL 34609, Tel: 904-796-3561; Empl.: 30; *Sls. Mgr.:* Bill Mason ..... **A•1065**

Local Sales Offices & Reps

NY Metropolitan, J.L. Sls. Assoc. 516-737-2801
TX Lewisville, Elctrn. Prod. Reps. 214-436-4772

CONDOR D.C. POWER SUPPLIES, INC., 2311 Statham Pkwy., Oxnard, CA 93033, Tel: 805-486-4565, TWX: 910-333-0681, FAX: 805-487-8911; Empl.: 250; *Sls. Mgr.:* Dan Horan, VP Mktg.; *Dist. Mgr.:* Deborah Perez ..... **D•1702-1710**

Local Sales Offices & Reps

AL Huntsville, The John Todd Co. 205-828-0808
AZ Phoenix, CPS Assocs. Inc. 602-246-1097
CA Brea, Masco Elctrns. 714-529-0866
CA Fremont, Telesis Sls. Grp. 415-657-8645
CO Denver, AKI Entprs. 303-388-4488
FL Orlando, Component Des. Mktg. 407-352-5480
IL Schaumberg, Engrg. Prods. 312-882-7640
IN Greenfield, Engrg. Prods. 317-894-7156
IA Cedar Rapids, C-Tron, Inc. 319-373-2029
KS Olathe, C-Tron, Inc. 913-829-0073
MA Taunton, Focus Elctrns. Sls., Inc. 617-824-3840
MN Edina, Engrg. Prods. 612-835-9022
MO St. Charles, C-Tron, Inc. 314-928-8078
NJ Medford, Comp. Consits. 609-654-5300
NY Pittsford, C. W. Beach 716-586-3200
NY Yonkers, Sonkin Assocs. 914-968-8282
OH Cleveland, Versatron 216-581-0090
SC Greenville, RF Sls. 803-234-6931
TX Dallas, M Rep 214-349-5523
Can Toronto, Ont., Duncan Instrs. 416-742-4448

Local Distributors

AL Huntsville, Allied Elctrns. 205-721-3500
AZ Phoenix, Aerospace S.W. 602-582-2779
CA Anaheim, Pacesetter Elctrns. 714-779-5855
CA Costa Mesa, FLW 714-751-7512
CA Hayward, FLW 415-786-9070
CA Orange, Milgray 203-795-0711
CA Santa Clara, Pyramid Elctrns. 408-727-9810
CA Sunnyvale, Pacesetter Elctrns. 408-734-5470
CA Sunnyvale, Sierra West 408-747-1188
CO Westminster, Future Elctrns. 303-650-0123
CT Orange, Milgray 203-795-0711
FL Ft. Lauderdale, Allied 305-486-0500
FL Orlando, Hammond Elctrns. 305-841-1010
FL Winter Pk., Milgray 305-647-5747
GA Atlanta, Milgray 404-446-9777
IL Chicago, Dalec Distrs. 312-283-0300
IL Schaumberg, Engrg. Prods. 312-882-7640
KS Overland Pk., Milgray 913-236-8800
MD Columbia, Milgray 301-621-8169
MD Columbia, Vantage 301-621-8555
MD Marlow Hgts., Allied 301-423-0161
MD Wheaton, Brimberg Sls. 301-946-2760
MA Westborough, Future Elctrns. 617-366-2400
MA Wilmington, Allied 617-942-0150
MI Ann Arbor, McNaughton-McKay 313-995-9515
MI Madison Heights, McNaughton-McKay 313-399-7500
MN Eden Prairie, Allied Elctrns. 612-829-7554
MN Edina, Engrg. Prods. 612-835-9022
MN Minneapolis, Aerospace Comp. Prod. 612-884-4725
NJ Marlton, Milgray 609-983-5010
NJ Mt. Laurel, Future Elctrns. 609-778-7600
NY Commack, Vantage 516-543-2000
NY Mineola, Allied 516-248-2360
NY Rochester, Future Elctrns. 716-272-7180
NY Yonkers, Kintronics 914-968-7736
NC Raleigh, Allied 919-876-5845
NC Raleigh, Allied Elctrns. 919-876-5845
OH Cleveland, Milgray 216-447-1520
OR Portland, Eoff 503-222-9411
TX Dallas, Cypress Elctrns. 214-869-1435
TX Fort Worth, Allied Elctrns. 817-336-5401
TX Richardson, Future Elctrns. 214-436-2437
UT Salt Lake City, Future Elctrns. 801-972-8489
WA Seattle, Allied 206-547-2827
WA Vancouver, Eoff 206-694-7504
Can Toronto, Ont., Duncan Inst. Ltd. 416-742-4448

CONDOR PACIFIC INDS., INC., 8053 Deering Ave., Canoga Park, CA 91304, Tel: 818-347-8331, TELEX: 65-1442, FAX: 818-713-0162; FSC No.: 24321; Empl.: 70

CONDOR SYSTEMS, INC., 2133 Branham Lane, San Jose, CA 95124, Tel: 408-371-9580, TELEX: 184819 Systems SANTA, FAX: 408-371-9589; FSC No.: 62065; Empl.: 150; *Sls. Mgr.:* Don Strandberg; *Dist. Mgr.:* Ed Brown

CONDUCTIVE RUBBER TECHNOLOGY, 201 N. Salsipuedes St., Ste. 100, Santa Barbara, CA 93103, Tel: 805-965-6511, TELEX: 658-305, FAX: 805-963-2652

CONDUCTIVE SYSTEM, INC., R.D. No. 1, Box 1040, Rte. 5 South, Amsterdam, NY 12010, Tel: 518-843-5740, FAX: 518-843-5829; *Sls. Mgr.:* John Severinsen

Local Sales Offices & Reps

AZ Scottsdale, American Mktg. Inc. 602-948-2778
CA Boulder, Comp. Prods. 303-530-2800
CA Canoga Park, C & W Comp. Sls. 818-700-2684
CA Los Altos, Frauman Assocs. 415-941-0660
CA San Diego, Vincon Sls. Co. 619-466-9785
CT Danbury, D. Setter 203-792-9446
FL Altamonte Springs, Lawrence Assocs. 407-339-3855

FL Boca Raton, Lawrence Assocs. 407-368-7373
FL Palm Bay, Lawrence Assocs. 407-951-0901
FL Palm Harbor, Lawrence Assocs. 813-787-2773
IL Park Ridge, Elctrn. Instr. 312-298-2290
IN Indianapolis, Elctrn. Instr. 317-257-7231
MD Baltimore, Bernie White & Co. 301-484-5400
MN Minneapolis, Deerland Distrs. 612-331-6433
MO St. Charles, Hayes Elec. 314-922-6607
NJ E. Windsor, Warren Engrg. Co. 609-443-3894
NY Farmington, Canavan Scanlon Assoc. 716-924-7450
NY Syracuse, Canavan-Scanlon 716-424-1830
OR Beaverton, Quest Mktg. Inc. 503-641-7377
TX Dallas, Scanlon, Hughes & Assocs. ... 214-739-2888
WA Bellevue, Quest Mktg. Inc. 206-747-9424
Can Lachine, ElectroDesign Ltd. 514-636-4838
Can Nepean, ElectroDesign Ltd. 613-727-5220
Can Toronto, ElectroDesign Ltd. 416-362-3859

CONEXCO INTERNATIONAL, 175-20 Hillside Avenue, Jamaica, NY 11432, Tel: 718-523-4100, FAX: 718-291-1803; *Sls. Mgr.:* Mike Costello; *Dist. Mgr.:* Lyda Magliaro

CONFORMING MATRIX, Box 5126, Pt. Pl. Sta., Toledo, OH 43611, Tel: 419-729-3777; Empl.: 35

CONKLIN INSTRUMENT CORP., West Rd., P.O. Box 650, Pleasant Valley, NY 12569, Tel: 914-635-2136, FAX: 914-635-2510; Empl.: 110; *Sls. Mgr.:* Steven Muise, VP Mktg.; *Dist. Mgr.:* Steven Muise, VP Mktg.

CONNECT-AIR INTERNATIONAL, INC., 50 37th St. N.E., Auburn, WA 98002, Tel: 206-939-4880, FAX: 206-939-4882; Empl.: 50; *Sls. Mgr.:* Ron Jones

CONNECTICUT HARD RUBBER CO., See CHR Inds.

CONNECTICUT MICROWAVE CORP., 106 Powder Mill Rd., Box 389, Canton, CT 06019, Tel: 203-693-4247; FSC No.: 50974; Empl.: 10; *Sls. Mgr.:* Michael DePalo

CONNECTOR ACCESSORIES, INC., See Mueller Elec. Co.

FAX: 312-539-3825

CONNECTOR CORP., 6025 N. Keystone Ave., Chicago, IL 60646, Tel: 312-539-3108, TWX: 910-221-6059; *Sls. Mgr.:* Diane Racana ..... **C•1314-1315**

CONNECTOR INDUSTRIES OF AMERICA DIV., Microdot Mfg., 639 N. Wayne, Cincinnati, OH 45215, Tel: 513-733-3680; FSC No.: 32076; Empl.: 55; *Sls. Mgr.:* Bob Cain

FAX: 312-851-5040

CONNOR-WINFIELD CORP., 1865 Selmarten Rd., Aurora, IL 60505-1335, Tel: 312-851-4722, TELEX: 270244; FSC No.: 5955; Empl.: 35; *Sls. Mgr.:* John Hoag ..... **A•1366-1369**

Local Sales Offices & Reps

AL Huntsville, Dean Assocs. 205-534-2255
CA Agoura Hills, C.D.H. Assocs. 818-707-1970
CA Los Altos, Frauman Assocs. 415-941-0660
CO Englewood, Tera-Link Corp. 303-799-8707
FL Clearwater Beach, Perrott Assocs. 813-443-5414
FL Orlando, Perrott Assocs. 407-298-7748
FL West Palm Beach, Perrott Assocs. 407-790-5722
ID Boise, Q.R. Crown 208-344-9588
MD Cockeysville, Koebert Assocs. 301-560-1926
NC Charlotte, Quantum Mktg. 704-365-4538
NC Raleigh, Quantum Mktg. 919-846-5728
OR Portland, Q.R. Crown 503-620-8320
PA Glenside, Koebert Assocs. 215-887-2310
WA Bellevue, Q.R. Crown 206-643-8100
WV Inwood, Koebert Assocs. 304-229-8401

CONRAC DISPLAY PRODUCTS, INC., A Mark IV Industries Co., 1724 S. Mountain Ave., Duarte, CA 91010, Tel: 818-303-0095, TELEX: 67-0437, TWX: 910-584-5913, FAX: 818-303-5484; Empl.: 250; *Sls. Mgr.:* G.L. Ives, Dir. Mktg. & Sls.

Consolidated electronic wire & cable

FAX: 312-455-8837

CONSOLIDATED ELECTRONIC WIRE & CABLE, 11044 King St., Franklin Park, IL 60131-1412, Tel: 312-455-8830, TWX: 910-227-1705; FSC No.: 73612; Empl.: 85; *Sls. Mgr.:* Karl Rankin; *Dist. Mgr.:* Steve Boynton ..... **C•1840-1847**

Local Sales Offices & Reps

AL Huntsville, JWL Assocs.,Inc. 205-883-1712
AZ Phoenix, Howe & Howe Sls. 602-264-7971
CA Los Gatos, Featherstone Sls. Co. 408-356-3243,
CA Pacifica, Featherstone Sls. Co. 415-355-3172,
CO Boulder, The Stratford Grp. 303-530-3194
CT Wethersfield, Compak 203-563-4784
FL Melbourne, Phoenix Comps. 305-723-4414,
GA Atlanta, JWL Assocs., Inc. 404-320-7643
IL Franklin Pk., Con. Elec. Wire & Cable 312-455-8830,
IL Highland Pk., Bransky Sls. 312-433-2375
IN Carmel, Frank E. Kahsan, Sls. Inc. 317-844-9353
IA Cedar Rapids, R. W. Kunz & Assocs. .. 319-396-5386
KS Prairie Village, R. W. Kunz & Assocs. .. 913-648-3535
LA Slidell, Tagco Sls. Co. 504-643-4751
MD Walkersville, Jadelectronic Assocs. ... 301-845-6063
MA Hudson, Compak 508-658-0331
MI Warren, Burcaw Co. 313-573-4605
MO St. Louis, R. W. Kunz & Assocs. 314-966-4977
NM Albuquerque, Syntech 505-266-7951
NY Buffalo, NRM Mktg. Group 716-634-4300
NY Skaneateles, NRM Mktg. Group 315-685-8991
NY Whitestone, Jack Brown Elctrns. 718-767-1917,
NC Charlotte, JWL Assocs., Inc. 704-541-5750
OH Cincinnati, Frank E. Kansar Sls., Inc. .. 513-922-3133
OK Tulsa, SW Mktg.Inc. 918-583-3892
OR Milwaukie, Comtec Intl. 503-654-6626
PA Birchrunville, Jadelectronic Assocs. ... 215-296-3800,
PA Sewickley, Frank E. Kansar Sls.,Inc. ... 412-741-4155
TX Austin, SW Mktg.Inc. 512-255-8010
TX Dallas, SW Mktg. Inc. 214-341-8631,
TX Houston, SW Mktg. Inc. 713-537-8166,
UT Salt Lake City, Advanced Control Equip. 801-972-9377,
WA Bellevue, Comtec Intl. 206-453-1188,

CONSOLINK CORP., 1840 Industrial Ctr., Longmont, CO 80501, Tel: 303-651-2014, TWX: 910-320-0786; Empl.: 25; *Sls. Mgr.:* Dan Zec; *Dist. Mgr.:* Judith Hester

CONTACT, INC., 5 Elm Ave., Hudson, NH 03051, Tel: 603-883-7708; FSC No.: M07015; Empl.: 11; *Sls. Mgr.:* R. Reid; *Dist. Mgr.:* R. Reid

CONTACT EAST, 335 Willow St. S., P.O. Box 786, N. Andover, MA 01845, Tel: 508-682-2000, TELEX: 383088, FAX: 508-688-7829; *Sls. Mgr.:* Richard Sullivan

CONTAQ TECHNOLOGIES CORP., 15 Main St., Bristol, VT 05443, Tel: 802-453-3332, FAX: 802-453-4250; FSC No.: 6680

CONTINENTAL RESOURCES, Computer & Peripherals Div., 175 Middlesex Tpke., Bedford, MA 01730, Tel: 617-275-0850, 800-937-4688, FAX: 617-275-6563; Empl.: 250; *Sls. Mgr.:* Mark Berling ..... **D•1085, 1237**

Local Sales Offices & Reps

CA Los Angeles, Continental Resources .. 213-638-0454
CA San Francisco, Continental Resources 408-263-1775
DC Washington, Continental Resources .. 202-948-4310
FL Orlando, Continental Resources 407-855-9544
IL Chicago, Continental Resources 312-860-5991
MA Boston, Continental Resources 617-275-0850
NJ Somerset, Continental Resources 201-563-0900
NY New York City, Continental Resources 212-695-3208
PA Philadelphia, Continental Resources .. 215-234-5100
TX Dallas, Continental Resources 214-458-7616

CONTINENTAL RESOURCES, INC, Test Instruments Div., 175 Middlesex Tpke., Bedford, MA 01730, Tel: 617-275-0850, 800-937-4688, FAX: 617-275-2046; Empl.: 250 ..... **D•1237**

Local Sales Offices & Reps

CA Los Angeles, Continental Resources .. 213-638-0454
CA San Francisco, Continental Resources 408-263-1775
NJ Somerset, Continental Resources 201-563-0900
FL Orlando, Continental Resources 407-855-9544
IL Bensenville, Continental Resources ... 312-860-5991
MD Gaithersburg, Continental Resources 301-948-4310
MA Bedford, Continental Resources 617-275-0850

Local Distributors

CA Los Angeles, Continental Resources .. 213-638-0454
CA San Francisco, Continental Resources 408-263-1775
DC Washington, Continental Resources .. 301-948-4310
FL Orlando, Continental Resources 407-855-9544
IL Chicago, Continental Resources 312-860-5991
MA Boston, Continental Resources 617-275-0850
NJ Somerset, Continental Resources 201-563-0900
NY New York City, Continental Resources 212-695-3208
PA Philadelphia, Continental Resources .. 609-234-5100
TX Dallas, Continental Resources 214-458-7616

CONTINENTAL SPECIALTIES CORP., See Global Specialties Corp.

CONTINENTAL WIRE & CABLE, Gulton Rd., P. O. Box 1863, York, PA 17405, Tel: 717-792-2644, TELEX: 84-0437; Empl.: 250; *Sls. Mgr.:* Edward W. Holland III; *Dist. Mgr.:* Shirley A. Eisenhart

CONTOURS INC., 290 Pratt St., Meriden, CT 06450, Tel: 203-237-8331, FAX: 203-237-6353; FSC No.: 033501; *Sls. Mgr.:* Eugene D. Rodman

CONTROL CABLE, INC., 7261 Ambassador Rd., Baltimore, MD 21207, Tel: 301-298-4411, FAX: 301-265-1646; FSC No.: 510124759; Empl.: 90; *Sls. Mgr.:* Greg Jones; *Dist. Mgr.:* Greg Jones

CONTROL CONCEPTS CORP., P.O. Box 1380, Binghamton, NY 13902-1380, Tel: 607-724-2484, TELEX: 62224380, FAX: 607-722-8713; Empl.: 41; *Sls. Mgr.:* Pat Gillette, VP Sls.; *Dist. Mgr.:* Fred Zack

CONTROL DATA CORP., P.O. Box O, Minneapolis, MN 55440, Tel: 1-800-828-8001 Operator 82, In MN 612-921-4400, FAX: 612-853-6748; Empl.: 6623; *Sls. Mgr.:* J. Repp; *Dist. Mgr.:* R. L. Kamps

CONTROL DISPLAYS, INC., 3075 Advance Lane, P.O. Box 227, Colmar, PA 18915, Tel: 215-822-3383, FAX: 215-997-1232; FSC No.: 27878; Empl.: 75; *Sls. Mgr.:* L. Rodrigue

CONTROL ELECTRONICS, Neurotech Corp., 139 Florida St., Farmingdale, NY 11735, Tel: 516-694-0125, FAX: 516-694-0133; FSC No.: 95924; Empl.: 60; *Sls. Mgr.:* Harold Goldstein; *Dist. Mgr.:* Barbara Kilroy .... **A•1540**

Local Sales Offices & Reps

CA Sherman Oaks, R.T. Assocs. 213-788-7588
FL Melbourne, VPI 305-768-9349
FL Tampa, VPI 813-832-2041
IL Chicago, Electro-Tech Mktg. Assoc. ... 312-676-3151
MD Ellicott City, VPI 301-461-2525
MA West Peabody, JK Assocs. 508-535-8068
PA Montgomeryville, Rufo Sys. Comp. 215-368-8495
TX Dallas, Texas Avionics Co. 214-363-6324
WI Brookfield, Electro-Tech Mktg. Assocs. 414-785-9554
EXP FL, Hallandale, Emec 305-925-6366

CONTROL ENGRG., INC., 190 Doty Circle, West Springfield, MA 01089, Tel: 413-781-1330; Empl.: 7; *Sls. Mgr.:* Mark Kimball

CONTROLEX, INC., Francestown Turnpike, New Boston, NH 03070, Tel: 603-487-5512, TELEX: 174094 FNB PETERBORO on TRT; Empl.: 7; *Dist. Mgr.:* Patricia Butler

CONTROLEX/EANCO, See Fincor

CONTROL LASER CORP., 7503 Chancellor Dr., Orlando, FL 32809, Tel: 407-438-2500, TELEX: 514215; Empl.: 130; *Sls. Mgr.:* David Montes, VP Sls./Mktg.

CONTROLLED ENVIRONMENTAL EQUIPMENT CORP., 3 Delta Drive, Westbrook, ME 04092, Tel: 207-854-9126, TELEX: 62903721, FAX: 207-854-4357; FSC No.: 25254; Empl.: 10; *Sls. Mgr.:* M. F. Peck

CONTROLLED POWER COMPANY

FAX: 313-528-0411

CONTROLLED POWER CO., 1955 Stephenson Hwy., Troy, MI 48083, Tel: 313-528-3700, 1-800-521-4792, TWX: 810-2323401; Empl.: 160; *Sls. Mgr.:* Reggie Peck ..... **D•2183-2187**

Local Sales Offices & Reps

AL Homewood, Control Equip. & Sls. 205-945-8454
AK Anchorage, Alaska Computer Environment 907-243-1429
AZ Phoenix, Gruber Assocs. 602-863-2655
CA Foster City, Computer Support Sys. ... 415-572-9994
CA La Habra, Gru Assocs. 213-691-2993
CA San Diego, Professional Power Sys. .. 619-581-1937
CO Denver, Computer Facility Components 303-778-8488
CO Denver, Computer Facility Comps. 303-778-9131
CT Woodbridge, Controlled Support Sys. 203-397-1721
FL Orlando, Data Rep 407-648-8460
GA Cummings, LASCOM, Inc. 404-493-0788
IL Crystal Lake, Carzoli Engrg. Sls. 815-459-4397
IN Indianapolis, Computer Enviro-Sys. ... 317-253-0749
MD Towson, H. L. Frey Corp. 301-821-0058
MA Abington, Bates & Assocs. 617-871-2626
MN Minneapolis, H.M. Cragg Company 612-721-7444
MO St.Louis, Rail Way Industry 314-966-3300
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NJ Englewood Cliffs, Power Conversion & Control 201-569-0015
NM Albuquerque, Sun Data Systems 505-272-1022
NY Buffalo, Bromor Company 716-874-4595
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OH Cincinnati, Goldschmidt Elec. Sls. 513-641-1708
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PA West Chester, T.P.S. 215-431-3670
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TX Richardson, Tubbesing Sales Corp. ... 214-234-3855
TX Stafford, Constant Power Systems 713-240-0404
UT Bountiful, Computer Power Technlgy. 801-295-4772
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VA Alexandria, ADAPT 703-684-6393
VA Virginia Beach, Precision Environments 804-473-8767
WA Seattle, Campbell Co. 206-622-3403
WA Seattle, Campbell Company 206-622-3403
WI Germantown, Rekco Inc. 414-784-3430
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Can Burnaby, BC, Datasphere Sales Ltd. .. 604-420-6040
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Can Winnipeg, MB, Datasphere Sales Ltd. 204-943-7102

CONTROL LOGIC, See Hancock Electronics Corp.

CONTROL MODULE, 380 Enfield St, Enfield, CT 06082, Tel: 203-745-2433, TELEX: 643167; Empl.: 160; *Sls. Mgr.:* D. Penn

CONTROL PRODUCTS, INC., 280 Ridgedale Ave., E. Hanover, NJ 07936, Tel: 201-887-9400, FAX: 201-887-5083; FSC No.: 81901; Empl.: 62; *Sls. Mgr.:* H.M. Stuhler; *Dist. Mgr.:* H.M. Stuhler

CSI

FAX: 818-709-8546

CONTROL SCIENCES, INC., 9509 Vassar Ave., Chatsworth, CA 91311, Tel: 818-709-5510, TELEX: 4970496(CSI); FSC No.: 53317; Empl.: 20; *Sls. Mgr.:* Rhod Zimmerman ..... **D•1161-1165**

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CT S. Glastonbury, Pace Assocs. 203-659-2266
IN Ft. Wayne, J & B Engrg. 219-483-2813
MI Rochester, Kinetic Technlgs. 313-656-0090
MN St. Paul, Northstar Motion & Control .. 612-770-5311
NY Victor, A & D Dvcs. 716-385-2778
NC Jamestown, Homersmith, Inc. 919-883-3999
PA Media, Homer Smith Sls. 215-543-2434
NY Albertson, DOL Engrg. 516-747-3944
TX Dallas, McDonald Assocs. 214-239-3293
UT Salt Lake City, Hannah-Hill 801-364-0606
VA Alexandria, Homersmith Inc. 703-922-6986

CONTROLS DIVISION, Ametek, Inc., 820 Pennsylvania Blvd., Feasterville, PA 19047, Tel: 215-355-6900, TELEX: 29-1769, FAX: 215-355-2937; Empl.: 100; *Sls. Mgr.:* R. Thomas Guinn

CONTROLS UNLIMITED, INC., 4823 North Ridge Rd., Perry, OH 44081, Tel: 216-259-2500, FAX: 216-259-5015; Empl.: 35

CONTROL TECHNOLOGY CO., INC., 41-16 29th St., Long Island City, NY 11101, Tel: 718-361-2133, FAX: 718-361-6386; FSC No.: 14545; Empl.: 35; *Sls. Mgr.:* H. Cooper ..... **D•2246-2247**

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Can Montreal, Que., Control Tech. Elctrns. CTC Canada, Ltd. 514-733-3279

CONTROL TECHNOLOGY, INC., 8200 N. Classen Blvd., Ste. 101, Oklahoma City, OK 73114, Tel: 405-840-3163, FAX: 405-848-0489; *Sls. Mgr.:* Charles Weddington; *Dist. Mgr.:* Charles Weddington

CONVER CORP., 916 W. Maude Ave., Sunnyvale, CA 94086, Tel: 408-739-9111, TWX: 910-338-2036, ESYLNK: 62024309, FAX: 408-739-9116; Empl.: 40; *Sls. Mgr.:* Robert Lloyd; *Dist. Mgr.:* Sherri Kirkpatrick

CONVERTER CONCEPTS INC

FAX: 608-429-9241

CONVERTER CONCEPTS, INC., Industrial Pkwy., Pardeeville, WI 53954, Tel: 608-429-2144, TWX: 910-280-2630; Empl.: 125; *Sls. Mgr.:* William A. Pearson ..... **D•1711-1713**

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FL Clearwater, Perrott Assocs. 813-443-5214
FL Orlando, Perrott Assoc. 305-298-7748
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PA Pittsburgh, JFCO 412-823-5400
TX Austin, Tesco 512-834-8374
TX Dallas, Tesco 214-553-1200
WA Kirkland, Northwest Comp. Sls. 206-828-4838
WV Inwood, Koebert Assocs. 304-229-8401
Can Nepean, Ont., Electro-Source, Inc. 613-726-1452
Can Rexdale, Ont., Electro-Source, Inc. 416-675-4490
Can Vancouver, BC, Davetek Mktg. 604-430-3680

COOKE VACUUM PRODS., INC., 13 Merritt St., Norwalk, CT 06854, Tel: 203-853-9500, FAX: 203-838-9553; Empl.: 45; *Sls. Mgr.:* Louis W. Genuario

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COOPER TOOLS, PO Box 30100, Raleigh, NC 27622, Tel: 919-781-7200, TELEX: 579497

C0-ORD SWITCH DIV., See LVC Inds., Inc.

COORS CERAMICS CO., 600 Ninth St., Golden, CO 80401, Tel: 303-278-4000, TELEX: 4322017; Empl.: 1700

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CORCOM, INC., 1600 Winchester Rd., Libertyville, IL 60048, Tel: 312-680-7400, TWX: 910-687-1058; FSC No.: 05245; Empl.: 1000; *Sls. Mgr.:* Dale Van Scoyk, Dir. OEM Sls. ..... **A•1644-1645; C•1317**

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CA Sunnyvale, Capsco Sls., Inc. 408-734-3020
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FL Plantation, E.I.R. Inc. 305-581-6905
FL Plantation, E.I.R. Inc. 305-791-8243
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KY Peewee Valley, Robert O. Whitesell ... 502-241-1441
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NY Manhasset, Win-Cor Elctrn. Sls. 516-627-9474
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TN Nashville, R. O. Whitesell Assocs. 615-352-4760
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TX Plano, K & H Sls. 214-423-6520
UT Salt Lake City, Straube Assocs. 801-263-2640
WA Seattle, Jas. J. Backer Co. 206-285-1300
WI Milwaukee, Beta Technlg. Sls. Inc. 414-543-6609

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AZ Phoenix, Marshall Inds. 602-496-0290
CA Chatsworth, Cetec/Future Elec. 818-700-0914
CA Garden Grove, Richey Impact 714-895-0060
CA Irvine, Cetec/Future Elec. 714-250-4141
CA Irvine, Marshall Ind. 714-458-5395
CA Irvine, Schweber 714-863-0200
CA Milpitas, Marshall Ind. 408-942-4600
CA San Diego, Cetec/Future Elec. 619-278-5020
CA San Diego, Marshall Ind. 619-578-9600
CA San Diego, Schweber 619-450-0454
CA San Jose, Schweber 408-432-7171
CO Thornton, Marshall Ind. 303-451-8444
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CT Wallingford, Greene Shaw 203-265-3333
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FL Deerfield Beach, Pioneer 305-771-7520
FL Ft. Lauderdale, Hammond Elctrns. 305-973-7103
FL Orlando, Hammond Elctrns. 407-849-6060
GA Atlanta, Marshall Ind. 404-923-5750
IL Addison, Pioneer/Chicago 312-495-9831
IL Chicago, Newark Elctrns. 312-784-5100
IL Palatine, OHM Elctrns. 312-359-5500
IN Indianapolis, Marshall 317-297-0483
IN Indianapolis, Pioneer 317-849-7300
KS Lenexa, Marshall 913-492-3121
MD Baltimore, Resco/Baltimore 301-529-0500
MD Beltsville, Resco/Washington 301-937-9100

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MI	Livonia, Marshall Inds.	313-525-5820
MI	Livonia, Pioneer	313-525-1800
MN	Eden Prairie, Pioneer/Twin Cities	612-944-3355
MN	St. Paul, Gopher Elctrns.	612-483-3322
MO	St. Charles, Finnigan Elctrns.	314-946-6201
NJ	Bellmawr, Mid Atlantic Elctrns. Corp.	609-931-5303
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NY	Fairport, Pioneer	716-381-7070
NY	Lynbrook, Peerless Radio Corp.	516-593-2121
NY	Mt. Vernon, QAR Indl. Elctrn. Sls.	914-699-2224
NY	Rochester, Simcona	716-328-3230
NY	Rochester, Summit Distrs.	716-334-8110
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NC	Raleigh, Marshall Inds.	919-878-9882
NC	Raleigh, Resco	919-781-5700
OH	Cleveland, Pioneer	216-587-3600
OH	Columbus, Elctrns. Mktg. Corp.	614-299-4161
OH	Dayton, Pioneer	513-236-9900
OR	Beaverton, Almac Elctrns.	503-629-8090
OR	Beaverton, Marshall Inds.	503-644-5050
PA	Horsham, Pioneer	215-674-4000
PA	Philadelphia, Almo Elctrns. Corp.	215-698-4000
PA	Pittsburgh, Pioneer	412-782-2300
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TX	Austin, Pioneer	512-835-4000
TX	Carrollton, Marshall Inds.	214-233-5200
TX	Dallas, Pioneer	214-386-7300
TX	Houston, Marshall Inds.	713-895-9200
TX	Houston, Pioneer	713-988-5555
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WA	Bellevue, Marshall Inds.	206-486-5747
WA	Spokane, Almac Elctrns.	509-924-9500
WI	Milwaukee, Marsh Elctrns.	414-475-6000

CORECO, INC., 6969 Trans-Canada Hwy, Ste. 113, St. Laurent, Que., Canada H4T 1V8, Tel: 800-361-4914, 514-333-1301, TELEX: 76001120 COR UC, FAX: 514-333-1388; Empl.: 32; *Sls. Mgr.:* Pat Urbain

CORES UNLIMITED, INC., 8311 Westminster Ave., Ste. 230, Westminster, CA 92683, Tel: 714-894-3062, 800-422-CORE, FAX: 714-895-4502; Empl.: 8

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CA	San Jose, Comtech Mktg.	408-294-5445
FL	Miami, BG Professional Sls.	305-932-2782
WA	Seattle, Allied Prods.	206-892-8870

CORLUND ELECTRONICS CORP., 2330 Teller Rd., Newbury Park, CA 91320, Tel: 805-499-6877, FAX: 805-499-4072; Empl.: 55; *Sls. Mgr.:* Gary Mesnick

CORMAN TECHNOLOGIES INC., 75 Bathurst Dr., Waterloo, Ontario, Canada N2V 1N2, Tel: 519-884-4430, FAX: 519-884-0204; *Sls. Mgr.:* Bill Lochead; *Dist. Mgr.:* Bill Lochead

CORNELL-DUBILIER ELCTRNS./SANGAMO COMPS., 1605 E. Rodney French Blvd., New Bedford, MA. 02744, MA 02741, Tel: 508-996-8561, TELEX: 929 419, FAX: 508-996-3830; Empl.: 5000; *Sls. Mgr.:* Anthony M. Cavuto, VP Sls.

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CORNELL MANUFACTURING, An Elgin Co., 25 Ramland Road, Orangeburg, NY 10962, Tel: 914-365-0400, FAX: 914-359-6809; Empl.: 50; *Sls. Mgr.:* Lou Schnur; *Dist. Mgr.:* Lou Schnur

CORNING GLASS WORKS, Materials Business, Main Plant, MP 21-3, Corning, NY 14831, Tel: 607-974-9000, TELEX: 932498, FAX: 607-974-7618; Empl.: 30000; *Sls. Mgr.:* Bryan Lanahan; *Dist. Mgr.:* Dennis Naylor

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CORTEC, INC., 15811 Chemical La., Huntington Bch., CA 92649, Tel: 714-897-2529, FAX: 714-897-2170; Empl.: 35

CORTRON DIV., See ITW Cortron, Illinois Tool Works

CORTRON DIV., See ITW Cortron, Illinois Tool Works

COSAR CORPORATION, 10375 Brockwood Rd., Dallas, TX 75238, Tel: 214-340-4584, 800-527-1207, TELEX: 506973; FSC No.: 20891; Empl.: 50; *Sls. Mgr.:* Jerry Jarka

COSMO CORPORATION, 3239 W. 14th St., Cleveland, OH 44109, Tel: 216-861-5594; Empl.: 500; *Sls. Mgr.:* B. Gordon

COTO CORPORATION

FAX: 401-942-0920

COTO CORPORATION, 55 DuPont Drive, Providence, RI 02907, Tel: 401-943-2686; Empl.: 250; *Sls. Mgr.:* John E. Beigel, Dir. Mktg. & Sls.; *Dist. Mgr.:* Aaron Smith ..... **B•1451-1455**

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CO	Denver, Spectrum Sls.	303-480-9991
CT	Warren, RI, Wm. Poisson & Assocs.	401-245-0260
DE	Hunt Valley, Eagle Sls. Corp.	301-666-3930
DC	Hunt Valley, Eagle Sls. Corp.	301-666-3930
FL	Tampa, Standard Mktg.	813-933-5833
IL	Downers Grove, Richmar Elctrns.	312-968-0118
IN	Indianapolis, Richmar Elctrns.	317-577-9950
NY	Great Neck, MOS Mktg. Assocs.	516-487-3966
NY	N. Syracuse, Advanced Comps. Corp.	315-699-2671
OR	Tigard, LD Elctrns.	503-684-8221
PA	Huntingdon Valley, Omega Elctrn. Sls.	215-947-4135
RI	Warren, Wm. Poisson & Assocs.	401-245-0260
TX	Plano, Richmar Elctrns.	214-424-8388
TX	Round Rock, Richmar Elctrns.	512-255-2551
UT	Ogden, Spectrum Mktg. Assocs. Inc.	801-972-8552
WA	Snohomish, LD Elctrns.	206-568-0511
WA	Spokane, LD Elctrns.	509-922-4883
WI	Butler, Richmar Elctrns.	414-781-1730
Can	Pointe Claire, Que., A. R. Gray Assocs.	514-694-6378

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CO	Denver, Spectrum Distrbn.	303-480-9991
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MA	Wilmington, Allied Elctrns.	508-942-0150
NY	Mineola, Allied Elctrns.	516-248-2360
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OK	Tulsa, Altair Co.	918-252-5781
CA	Saratoga, Testco, Inc.	408-253-1900
SC	Raleigh, Allied Elctrns.	919-876-5845
TX	Austin, Altair Co.	512-837-4970
TX	Dallas, Allied Elctrns.	214-553-4370
TX	Houston, Altair Co.	713-462-3029
TX	Richardson, Altair Co.	214-231-5166
UT	Ogden, Spectrum Mktg. Assocs., Inc.	801-972-8552
EXP	TX/Ft. Worth, Allied Elec./Exp. Svcs.	817-336-5401

COTRONICS, 3379 Shore Pkwy., Brooklyn, NY 11235, Tel: 718-646-7996, FAX: 718-646-3028; Empl.: 15; *Sls. Mgr.:* Alan Marks

COUTANT ELECTRONICS LIMITED, Kingsley Ave., Ilfracombe, Devon, England EX34 8ES, Tel: (0271)63781, TELEX: 46310, FAX: (0271)64894; Empl.: 330; *Sls. Mgr.:* Andrew Tweedie; *Dist. Mgr.:* Andrew Tweedie

COVER CRAFT CORP., See Amherst International Corp., Cover Craft Div.

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CPS, INC., 1362 Borregas Ave., Sunnyvale, CA 94089, Tel: 408-734-8980, TELEX: 35-7450, FAX: 408-734-8993; FSC No.: 31640; Empl.: 30; *Sls. Mgr.:* Clifford Gaw

CP TECHNOLOGY, INC., 21143 Christensen Drive, Cupertino, CA 95014, Tel: 408-996-8069; Empl.: 6

CRAFT DATA, INC., 27022 Cordero Lane, Mission Viejo, CA 92691, Tel: 714-582-8284, TELEX: 751875 Craft Data, FAX: 714-556-8325; Empl.: 4

CRAIG SYSTEMS CORP., Hanson Industries, 10 Industrial Way, Amesbury, MA 01913-4848, Tel: 508-388-5662, TWX: 710-347-0590, FAX: 508-388-0845; FSC No.: 81902; Empl.: 230; *Sls. Mgr.:* Roger Chouinard

CRAMER COIL & TRANSFORMER CO., INC., 401 Progress Dr., Saukville, WI 53080, Tel: 414-284-9425, FAX: 414-377-4028; Empl.: 70; *Sls. Mgr.:* Patti Lincoln

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CA	Santa Clara, Fischer Assocs.	408-733-7350
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CT	Bethany, The Reps. Corp.	203-393-0024
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IN	Frankfort, C-S Elctrn. Sls.	317-659-1874
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MD	Ellicott City, American Technlg. Assoc.	301-461-5599
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MN	Eden Prairie, Hanna Lind	612-942-8554
NY	Fulton, Carl Truax, Inc.	315-592-7184
NC	Kernersville, Wallace Elctrns. Sls.	919-996-2742
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CREATIVE MICRO SYSTEMS, 3822 Cerritos Ave., Los Alamitos, CA 90720, Tel: 213-493-2484, FAX: 213-493-3553; Empl.: 24; *Sls. Mgr.:* Margaret E. Prossen

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CRISSMAN MANUFACTURING CO., 11004 Bakley St., Huntley, IL 60142, Tel: 312-669-3995 ..... **C•1020**

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CRL COMPS., INC., A Cambridge Elctrn. Inds. Co., Highway 20 West, Fort Dodge, IA 50501, Tel: 515-573-1300; FSC No.: 71590; Empl.: 500; *Dist. Mgr.:* Jim Wood ..... **A•2104; B•1704-1708**

Local Sales Offices & Reps

AZ	Tucson, Clemick & Assocs.	602-749-4003
CA	Pleasanton, Moulthrop Sls., Inc.	415-463-0450
CA	Valencia, C & N Assocs., Inc.	805-254-5844
CT	Branford, Coakley, Boyd & Abbett	203-481-2218
FL	Ft. Lauderdale, Panamtech	305-587-3769
FL	Oviedo, Panamtech	407-677-4448
IL	Rolling Meadows, Sumer, Inc.	312-991-8500
IN	Indianapolis, Leslie M. Devoe Co.	317-842-3245
IA	Cedar Rapids, Lorenz Sls., Inc.	319-377-4666
KS	Merriam, Lorenz Sls., Inc.	913-384-6556
MA	Needham Hgts., Coakley, Boyd, & Abbett, Inc.	617-444-5470
MI	Royal Oak, Hilltronics, Inc.	313-435-0920
MN	Minneapolis, Electric Comp. Sls., Inc.	612-933-2594
MO	University City, Lorenz Sls., Inc.	314-997-4558
NE	Lincoln, Lorenz Sls., Inc.	402-475-4660
NJ	Englewood Cliffs, Ed Glass Assocs.	201-592-0200
NY	Skaneateles, Empire Tech. Assoc.	315-685-5703
OH	Cleveland, Arthur H. Baier Co.	216-461-6161
OK	Tulsa, DJ Sls. & Assocs.	918-663-8155
OR	Beaverton, Eclipse Mktg. Grp.	503-642-1661
PA	Narberth, Bresson Assocs.	215-664-6460
TX	Dallas, DJ Sls. & Assocs.	214-783-8876
WA	Redmond, Eclipse Mktg. Grp.	206-885-6991
WA	Spokane, Eclipse Mktg. Grp.	509-922-3972
WI	Brookfield, Sumer, Inc.	414-784-6641
Can	Pickering, Ont., McHugh Elctrns.	416-831-4773
Can	Vancouver, B.C., Arwin Tech. Sls.	604-980-4557

CROMPTON INSTRUMENTS, INC., 800 Regency Dr., Glendale Heights, IL 60139, Tel: 312-351-9888, TELEX: 210295, FAX: 312-351-9889; FSC No.: 53498

CROMPTON INSTRS., Hawker Siddley, 2763 Old Higgins Rd., Elk Grove Village, IL 60007, Tel: 312-593-1107, TELEX: 210295, FAX: 312-439-5747; Empl.: 38; *Sls. Mgr.:* Wayne Bordelon

CROMPTON METERMASTER INC., 2507 N. Erie Dr., Tempe, AZ 85282, Tel: 602-431-0880; *Sls. Mgr.:* Steve Alexander

CROSS BROTHERS, INC., 5255 Sheila St., Los Angeles, CA 90040, Tel: 213-266-2000, FAX: 213-266-2106; Empl.: 17; *Sls. Mgr.:* Steven S. Krause

CROSS ELECTRONICS, 100 Commonwealth Dr., Warrendale, PA 15086, Tel: 412-776-1591; Empl.: 35; *Sls. Mgr.:* L. R. Craig

CROSSPOINT, Div. of Info-Lite, 422 Cliff St., Fairview, NJ 07022, Tel: 201-941-4455, FAX: 201-941-4919; FSC No.: FSCM 52116; Empl.: 13; *Sls. Mgr.:* Joseph M. Cartelli; *Dist. Mgr.:* Joseph M. Cartelli ..... **B•1709**

Local Sales Offices & Reps

CA	Granada Hills, Crown Elctrns.	818-368-7475
CA	Redwood City, Caltronic Assocs.	415-365-2545
CT	Weston, CJA Assoc.	203-226-4317
MI	Plymouth, Leading Edge Sls. Corp.	313-420-3344
NY	Syracuse, Lenard Co.	315-479-9191
OH	Cleveland, A.S.A.	216-232-4946
OH	Dayton, Mohawk Intronics	513-434-8873

CROUZET CONTROLS, INC., 1083 State Pkwy., Schaumburg, IL 60173-5419, Tel: 312-843-2200, TELEX: 210 219, FAX: 312-310-8330; Empl.: 18; *Sls. Mgr.:* Benoit Delcourt ..... **B•1239, 1711**

Local Sales Offices & Reps

CA	Corona Del Mar, Motion Control of So. CA	714-675-0211
CA	San Ramon, C. F. M. Sls.	415-866-1705
CO	Denver, Ralph R. Pence & Assocs.	303-936-3464
FL	Clearwater, Gen. Controls, Inc.	813-791-1903
IN	Indianapolis, Emsco Sls. & Engrg. Co.	317-251-7074
IA	Bettendorf, Custom Controls Ltd.	319-355-4787
MA	Taunton, Electro-Kinetics	617-880-0182
MA	Wellesley, Electro Kinetics	617-235-9415
MA	Wenham, Electro-Kinetics	617-468-4166
MN	Minneapolis, DeBeck-Hays Assoc.	612-835-3610
MO	Webster Grove, Schutz & Assocs. Ind. Sls., Inc.	314-962-2622
NY	Fairport, Tac Sls.	716-425-1070
NY	Plainview, Motion Control Sls.	516-756-5656
OH	Cincinnati, Bob Gilbert & Assocs.	513-574-1932
OH	Cincinnati, Bob Gilbert & Assocs.	513-761-4598
PA	Horsham, Jacobsen & Assocs.	215-674-2937
TX	Dallas, Blackburn & Assoc.	214-750-8484
UT	Salt Lake City, Advanced Control Equip.	801-485-0305
WA	Bellevue, Sea Inc.	206-883-4999
WA	Vancouver, Sea Inc.	206-573-5161
Can	Downsview, Ont., Tienkay Inc.	416-736-1221
Can	Longueuil, Que., Decofer	514-651-0285

Local Distributors

CA	Los Angeles, Master Distr.	213-452-1229
CA	San Carlos, Wertern Comp. Sls. N.	415-594-1222
CO	Colorado Springs, Summit Fasteners & Elec. Hdwe.	303-593-7700
FL	Hollywood, M.P. Assocs.	305-962-5751
FL	Lakeland, A. A. Elec.	813-665-6941
GA	Smyrna, Waffles Elec.	404-433-8377
IL	Chicago, Excel Elec.	312-421-7220
IL	Chicago, Hawk Elctrns.	312-459-4030
IL	Chicago, MC Master-Carr	312-834-9600
IN	Ft. Wayne, Bell Inds.	219-423-3422
IN	Indianapolis, Bell Inds.	317-634-8202
IN	Indianapolis, Control Des. Supp.	317-788-4559
IN	Indianapolis, Vonnegut Indl. Prods.	317-899-8800/8877
IA	Bettendorf, Custom Controls Ltd.	319-335-4787
MA	Wellesley, Electro-Mechanical Distr.	617-235-1565
MI	Comstock Park, Mor Elec.	616-784-1121
MI	Grand Rapids, S-F Electronics	616-459-0216
MI	Royal Oak, George Instr. Co.	313-280-1111
MI	Saginaw, Fischer-Flack	517-752-4181
MN	St. Paul, Powermation	612-645-0781
NE	Omaha, Lakeland Engrg.	402-734-2600
NJ	Edison, Howman Applied Control Prods.	201-797-3313
NJ	Fair Lawn, Relay Specialties	201-797-3313
NC	Asheville, Electric Supply Co.	704-255-8899
NC	Gastonia, J.M.T. Elctrn. Supp.	704-867-4401
NC	Winston-Salem, Kirkman Elctrns.	919-722-9131
OH	Cincinatti, Hughes-Peters.	513-351-2000
OH	Cleveland, Reserve Motion Control Sys.	216-826-0290
OH	Columbus, Hughes-Peters.	614-294-5351
OH	Dayton, Dueilman Elctrns.	513-461-5010
OK	Tulsa, Radio Inc.	918-587-9123
PA	Allentown, P. A. Peters.	215-434-5237
PA	Philadelphia, Herbach & Rademan	215-426-1700
SC	Greenville, Holder Elec. Supp.	803-271-7111
TX	Ft. Worth, Swieco.	817-335-6521
WA	Kent, Motors & Controls Corp.	206-872-8010
WA	Seattle, Eicher-Richards Co.	206-523-7888
WI	Waukesha, Powermation	414-542-2868
Can	St. Hubert, Que., Decofer	514-678-2252
Can	Willowdale, Ont., PS Comps.	416-498-0214

CROVEN CRYSTALS, 500 Beech St., Whitby, ON, Canada L1N 5S5, Tel: 416-668-3324, FAX: 416-668-5003; FSC No.: 00809; Empl.: 250; *Sls. Mgr.:* R. McCormick ..... **A•1371**

Local Sales Offices & Reps

AZ	Mesa, Sedco Sls.	602-461-9069
CA	San Mateo, Melvin Sls.	415-349-7444
CA	Trabuco Canyon, Martronix	714-858-0632
FL	Longwood, D-Assocs.	407-830-8976
MA	Milton, Naton Assoc.	617-698-0670
MO	St. Charles, Hayes Elec. Sls.	314-946-6677
NY	Melville, Cames Assocs.	516-694-1600
OH	Englewood, Clayton-Ellier Co.	513-836-3556
PA	Glenside, Koebert Assocs. Inc.	215-887-2310
TX	Euless, Fralia Co. & Assocs.	817-267-3577
PA	Glensida, Koebert Assoc.	215-887-2310
WA	Bellevue, Eltech, Inc.	206-643-4330
WI	Oconomowoc, Artmor Ltd.	414-367-8789

CROZIER METROLOGY LAB, 160 N. Bond St., Elk Grove, IL 60007, Tel: 312-934-5634, FAX: 312-934-5634; Empl.: 5; *Sls. Mgr.:* Richard D. Crozier

CRYOMAGNETICS, INC., 739 Emory Valley Rd., Oak Ridge, TN 37830, Tel: 615-482-9551, TELEX: 883 945, FAX: 615-483-0406; *Sls. Mgr.:* D. Michael Coffey

CRYSTALOID ELECTRONICS, Box 628, Hudson, OH 44236, Tel: 216-655-2429, FAX: 216-655-2176; Empl.: 100

CRYSTEK CORP, P.O. Box 06135, Ft. Myers, FL 33906, Tel: 813-936-2109, TWX: 510-951-7448; FSC No.: 13454; Empl.: 60

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Local Sales Offices & Reps

AL	Huntsville, EMA, Inc.	205-830-4030
AR	Ft. Smith, Electra Reps, Inc.	501-452-7822
CA	Cerritos, Crydom Co.	213-865-3536
CA	Pleasanton, Sierra Sls. Engrg.	415-463-2250
CA	Stockton, Sierra Sls. Engrg.	209-465-3968
FL	Deerfield Bch., EMA Inc.	305-421-6830
FL	Longwood, EMA, Inc.	305-682-1202
GA	Roswell, EMA, Inc.	404-992-7240
IL	Elk Grove Village, Control Sls.	312-595-2110
IN	Carmel, Technology Mktg. Corp.	317-844-8462
IN	Ft. Wayne, Technology Mktg. Corp.	219-432-5553
KY	Louisville, Technology Mktg. Corp.	502-893-1377
PA	Chestnut Hill, Deltratronics, Inc.	215-248-0294
MA	North Reading, Alpha Omega Sls.	508-664-1118
MI	Farmington Hills, Luebbe Sls.	313-489-8828
MN	Eden Prairie, Electronic Innovators, Inc.	612-941-0830
MO	St. Louis, Midtec Assocs.	314-275-8666
NY	Binghamton, GEN-TECH Elctrns.	607-648-8833
NY	Liverpool, Gen-Tech Elctrns.	315-451-3480
NY	Penfield, Gen-Tech Elctrns.	716-381-5159
NC	Charlotte, EMA, Inc.	704-365-0547
NC	Raleigh, EMA, Inc.	919-846-6888
OH	Cincinnati, Luebbe Sls. Co.	513-530-0600
OH	Cleveland, Cleveland Luebbe Sls.	216-333-0425
OH	Columbus, Luebbe Sls. Co.	614-431-0474
OH	Dayton, Luebbe Sls. Co.	513-294-0426
OR	Hillsboro, Turn-a-Round Sls.	503-640-4641
PA	Chestnut Hill, Deltatronics Inc.	215-248-0294
PA	Pittsburgh, Luebbe Sls. Co.	412-364-0490
TX	Austin, Electra Reps.	512-339-1163
TX	Dallas, Electra Reps.	214-248-3852
UT	Salt Lake City, Control Agy.	801-972-8787
VA	Richmond, McCourt Co., Inc.	804-741-3253
WI	Brookfield, Control Sls.	414-797-9500

CSB/USA, 1204 W. 7th St., Ft. Worth, TX 76102, Tel: 800-3CSB/USA, 817-332-1309, FAX: 817-332-6036; *Sls. Mgr.:* Gregg Hubbard ..... **D•1478**

Local Sales Offices & Reps

AL	Huntsville, Rep, Inc.	205-881-9270
CA	Arcadia, Van Gott & Assocs.	818-445-9728
CA	Los Altos, Frauman Assocs.	415-941-0660
GA	Atlanta, Rep, Inc.	404-938-4358
IL	MortonGrove, Power Pak, Inc.	312-966-6000
IL	Palatine, Technlg. Sls., Inc.	312-991-6600
IN	Granger, Wolff Sls., Inc.	219-272-4388
MA	Seekonk, Rudolph Mktg. Assocs.	617-399-6270
MI	Grand Rapids, Stiles & Assocs.	616-531-7759
NY	Franklin Sq., Cooper-Simon & Co., Inc.	516-489-0404
NC	Charlotte, Rep, Inc.	704-563-5554
OH	Lima, T.C. Co.	419-226-6952
TN	Knoxville, Rep, Inc.	615-475-9012
WI	Milwaukee, Technlg. Sls., Inc.	414-964-5015

Local Distributors

CA	San Diego, Tauber Elctrns.	619-274-7242
GA	Smyrna, ERC Parts, Inc.	404-352-1626

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CSD INDUSTRIES, INC., dba C Enterprises, 310-110 Via Vera Cruz, San Marcos, CA 92069, Tel: 619-744-8182, 800-334-3815, 800-423-3345, TELEX: 6502969639MCI, FAX: 619-744-1659; Empl.: 56; *Sls. Mgr.:* Linda Medina; *Dist. Mgr.:* Steve Rosoff

CSI Capacitors

CSI CAPACITORS, CSI Technologies, 810 Rancheros Dr., San Marcos, CA 92069, Tel: 619-747-4000, TELEX: 697832; FSC No.: 10026; Empl.: 50; *Sls. Mgr.:* J. D. Kowalsky ..... **A•1067**

Local Sales Offices & Reps

AZ	Paradise Valley, Astrocom Mktg.	602-991-6646
CA	San Jose, Comtech Mktg.	408-365-7474
FL	Orlando, SAM Rep., Inc.	407-869-9565
IL	Chicago, Esco Assocs.	312-298-5310
KY	Louisville, K. W. Elctrn. Sls.	614-888-0483
MD	Middletown, ST/Woolard	301-371-4500
MA	Canton, New England Elctrn. Sls.	617-828-4835
NM	Albuquerque, Cleveland Entprs.	505-265-7893
NY	Cazenovia, S. T. Woolard	315-655-8145
OH	Dayton, K. W. Elctrn. Sls.	513-890-2150
OR	Tigard, Components West	503-684-1671
PA	Allison Pk., KW Elctrn. Sls.	412-487-4300
SC	Pickens, S.T. Woolard	803-878-3830
VA	Lynchburg, ST/Woolard	804-528-5421
WA	Redmond, Components West	206-885-5880
Can	Richmond, BC, Macom Agencies	604-271-2661

CSTS, 4015 E. Leaverton Ct., Anaheim, CA 92807, Tel: 714-632-1300, FAX: 714-632-1937; Empl.: 14

C-TEK INC., 4 Railroad Ave., Wakefield, MA 01880, Tel: 617-246-1720, FAX: 617-246-2905; Empl.: 15; *Sls. Mgr.:* John Vanaman; *Dist. Mgr.:* John Vanaman ..... **D•1142-1143**

Local Sales Offices & Reps

IL	Westchester, Cadre Technical Reps, Inc.	312-449-3900
CT	Seymour, R.H. Sturdy Co., Inc.	203-888-1480
IL	Hillside, Cadre Tech. Reps.	312-449-3900
MA	Wellesley Hills, R. H. Sturdy Co.	617-235-2330
MA	Wellesley Hills, R.H. Sturdy Co., Inc.	617-235-2330
MN	Minneapolis, Northstar Motion & Control	612-571-9600
MN	St. Paul, Northstar Motion & Control	612-770-5311
NY	Buffalo, Good Comps. Corp.	716-634-4400
Can	Nepean, Ont., Tech- Trad	613-727-1272
NC	Charlotte, Jake Rudisill Assocs.	704-377-6901
VA	Richmond, Jake Rudisill Assocs.	804-320-0201

Local Distributors

NC	Charlotte, Motionex	704-377-6901

CTI ELECTRONICS, 200 Benton Street, Stratford, CT 06497, Tel: 203-386-9779, TWX: 710-465-6349, FAX: 203-378-4986; Empl.: 19 ..... **D•1087**

Local Sales Offices & Reps

AL	Huntsville, Rakes Engrg. & Mktg. Corp.	205-533-3763
CA	Los Angeles, Leo Miller Co.	213-832-5858
CA	San Jose, Motion Sys., Inc.	408-246-0641
CT	Bridgeport, CTI Elctrns.	203-366-9444
FL	New Port Richey, Spinney Assocs.	813-848-8578
GA	Atlanta, Rakes Engrg. & Mktg. Corp.	404-447-6937
MO	Blue Springs, A-Tronics Sls. & Engrg. Co.	816-224-2131
NH	Manchester, Northeast Comps.	603-627-7242
NY	New Hartford, PDQ Assocs.	315-793-3666
OH	Columbus, McFadden Sls.	614-761-3177
PA	Glenside, Wyncote Instrmn. Co.	215-572-6500
TX	Dallas, Hamilton Elctrns.	214-987-3326
VA	Reston, Delmarva Technlgs.	703-620-3555
WI	Appleton, Vine Tech. Sls.	414-731-9873
WI	Genoa City, Vine Tech. Sls.	414-279-3871

CTS CORPORATION, 905 West Blvd. North, Elkhart, IN 46514, Tel: 219-293-7511, TWX: 810-294-2167; Empl.: 6,500; *Dist. Mgr.:* George Greener

Local Distributors

AL	Huntsville, Arrow Elctrns., Inc.	205-837-6955
AL	Huntsville, Bell Inds.	205-837-1074
AL	Huntsville, Hall-Mark Elctrns. Corp.	205-837-8700
AL	Huntsville, Marshall Inds.	205-881-9235
AZ	Phoenix, Marshall Inds.	602-496-0290
AZ	Tempe, Arrow Elctrns., Inc.	602-968-4800
AZ	Tempe, Bell Inds.	602-966-7800
CA	Canoga Pk, Hall-Mark Elctrns. Corp.	818-716-3300
CA	Chatsworth, Arrow Elctrns., Inc.	818-701-7500
CA	Chatsworth, Marshall Inds.	818-407-0101
CA	Citrus Hgts., Hall-Mark Elctrns. Corp.	916-722-8600
CA	El Monte, Marshall Inds. (Corp.)	818-459-5500
CA	Garden Grove, Bell Inds.	714-895-7801
CA	Gardena, Bell Inds.	213-515-1800
CA	Gardena, California Switch & Signal	213-538-9830
CA	Irvine, Marshall Inds.	714-859-5050
CA	Los Angeles, Bell Inds.	213-826-6778
CA	Milpitas, Marshall Inds.	408-942-4600
CA	Rancho Cordova, Marshall Inds.	916-635-9700
CA	Rohnert Pk., First Source Elctrns. Corp.	707-586-0800
CA	Roseville, Bell Inds.	916-969-3100
CA	San Carlos, Logan Elctrns.	415-594-0700
CA	San Diego, Arrow Elctrns., Inc.	619-565-4800
CA	San Diego, Bell Inds.	619-268-1277
CA	San Diego, Hall-Mark Elctrns. Corp.	619-268-1201
CA	San Diego, Marshall Inds.	619-578-9600
CA	San Jose, Hall-Mark Elctrns. Corp.	408-432-0900
CA	San Jose, Rose Elctrns.	408-263-9700
CA	Sunnyvale, Arrow Elctrns., Inc.	408-745-6600
CA	Sunnyvale, Bell Inds.	408-734-8570
CA	Thousand Oaks, Bell Inds.	805-499-6821
CA	Torrance, Hall-Mark Elctrns. Corp.	213-217-8400
CA	Tustin, Arrow Elctrns., Inc.	714-838-5422
CA	Tustin, Hall-Mark Elctrns. Corp.	714-669-4100
CO	Aurora, Arrow Elctrns., Inc.	303-696-1111
CO	Denver, Integrated Elctrns. Co., Inc.	303-292-6121
CO	Englewood, Indl. Elctrns.	303-694-9444
CO	Englewood, Indl. Elctrns., Inc.	303-694-9444
CO	Thorton, Marshall Inds.	303-451-8444
CT	Wallingford, Arrow Elctrns., Inc.	203-265-7741
CT	Wallingford, Marshall Inds.	203-265-3822
CT	Wallingford, Midan Elctrns., Inc.	203-265-2077
CT	Wallingford, The Greene-Shaw Co., Inc.	203-265-3333
FL	Clearwater, Hall-Mark Elctrns. Corp.	813-530-4543
FL	Deerfield Bch., Arrow Elctrns., Inc.	305-429-8200
FL	Deerfield Bch., Bell Inds.	305-421-1997
FL	Ft. Lauderdale, Marshall Inds.	305-977-4880
FL	Largo, Bell Inds.	813-541-4434
FL	Orlando, Hall-Mark Elctrns. Corp.	305-855-4020
FL	Orlando, Marshall Inds.	305-841-1878
FL	Palm Bay, Arrow Elctrns., Inc.	305-841-2424
FL	Pompano Bch., Hall-Mark Elctrns. Corp.	305-971-9280
GA	Norcross, Arrow Elctrns., Inc.	404-449-8252
GA	Norcross, Bell Inds.	404-662-0923
GA	Norcross, Hall-Mark Elctrns. Corp.	404-447-8000
GA	Norcross, Marshall Inds.	404-923-5750
IL	Elk Grove Vl., Bell Inds.	312-640-1910
IL	Schaumburg, Arrow Elctrns., Inc.	312-397-3440
IL	Shaumburg, Marshall Inds.	312-490-0155
IL	Wheeling, Hawk Elctrns.	312-459-4030
IL	Wooddale, Hall-Mark Elctrns. Corp.	312-860-3800
IN	Ft. Wayne, Bell Inds.	219-423-3422
IN	Indianapolis, Arrow Elctrns., Inc.	317-243-9353
IN	Indianapolis, Bell Inds.	317-875-8200
IN	Indianapolis, Bell Inds. (JIT Only)	317-299-5487
IN	Indianapolis, Marshall Inds.	317-297-0483
IA	Cedar Rapids, Arrow Elctrns.	319-395-7230
IA	Cedar Rapids, Bell Inds.	319-395-0730
KS	Lenexa, Arrow Elctrns., Inc.	913-541-9542
KS	Lenexa, Hall-Mark Elctrns. Corp.	913-888-4747
KS	Lenexa, Marshall Inds.	913-492-3121
MD	Columbia, Arrow Elctrns., Inc.	301-995-0003
MD	Columbia, Hall-Mark Elctrns. Corp.	301-988-9800
MD	Gaithersburg, Marshall Inds.	301-840-9450
MA	Newton, The Greene-Shaw Co., Inc.	617-969-8900
MA	Wilmington, Marshall Inds.	617-658-0810
MA	Woburn, Arrow Elctrns., Inc.	617-933-8130
MI	Ann Arbor, Arrow Elctrns., Inc.	313-522-1040
MI	Ann Arobor, Bell Inds.	313-971-9093
MI	Grand Rapids, Arrow Elctrns. Inc.	616-243-0912
MI	Livonia, Marshall Inds.	313-525-5850
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MN	Edina, Arrow Elctrns., Inc.	612-830-1800
MN	Minneapolis, Indl. Comps., Inc.	612-831-2666
MN	Plymouth, Marshall Inds.	612-559-2211
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MO	St. Louis, Arrow Elctrns., Inc.	314-567-6888
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NH	Manchester, Arrow Elctrns., Inc.	603-668-6968
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NJ	Fairfield, Marshall Inds.	201-882-0320
NJ	Marlton, Arrow Elctrns., Inc.	609-596-8000
NJ	Mt. Laurel, Hall-Mark Elctrns. Corp.	609-235-1900
NJ	Mt. Laurel, Marshall Inds.	609-234-9100
NJ	Parsippany, Arrow Elctrns., Inc.	201-538-0900
NM	Albuquerque, Arrow Elctrns., Inc.	505-243-4566
NM	Albuquerque, Bell Inds.	505-292-2700
NY	Buffalo, Summit Dists.	716-887-2800
NY	Commack, Vantage Comps.	516-543-2000
NY	Hauppauge, Arrow Elctrns., Inc.	516-231-1000
NY	Hauppauge, Marshall Inds.	516-273-2424
NY	Jamaica, Archer Indl. Dists., Inc.	718-291-3232

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NY Melville, Semispecialists of America, Inc. (SAI) 516-293-2710
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OH Dayton, Bell Inds. 513-435-8660
OH Dayton, Marshall Inds. 513-236-8088
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OH Solon, Hall-Mark Elctrns. Corp. 216-349-4632
OH Solon, Marshall Inds. 216-248-1788
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TX Austin, Marshall Inds. 512-837-1991
TX Austin, Southwest-Elctrns., Inc. 512-837-8971
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TX Houston, Hall-Mark Elctrns. Corp. 713-781-6100
TX Houston, Marshall Inds. 713-895-9200
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CTS CORPORATION, Connector Division, 9210 Science Center Dr., New Hope, MN 55428, Tel: 612-533-3533, TWX: 910-576-2717; FSC No.: 16512; Empl.: 300; *Sls. Mgr.:* Steve Otto

'Refer to CTS Corp., Elkhart, IN, for sales offices & representatives & for distributor listings.'

CTS CORP., ELECTROMECHANICAL DIV., (Formerly Elkhart Div.), 1142 W. Beardsley Ave., Elkhart, IN 46514, Tel: 219-295-3575, FAX: 219-295-2099; *Sls. Mgr.:* R. G. Sumrak

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CTS CORPORATION, Microelectronics Div., 1201 Cumberland Ave., W. Lafayette, IN 47906, Tel: 317-463-2565, TWX: 810-342-1882; Empl.: 505; *Sls. Mgr.:* Dick Kramer

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CTS CORP., RESISTOR NETWORK DIV., (Formerly CTS Corp., Berne Div.), 406 Parr Rd., Berne, IN 46711, Tel: 219-589-3111, TWX: 810-323-1580; Empl.: 1100; *Sls. Mgr.:* D. L. Akers; *Dist. Mgr.:* Cliff Stults ..... **A•1922-1923**

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CTS CORPORATION, Switch Div., Paso Robles, 500 Linne Rd., Paso Robles, CA 93446, Tel: 805-238-0350, TELEX: 62537040, FAX: 805-238-9663; *Sls. Mgr.:* Jack Bell; *Dist. Mgr.:* Bob Tarkenton ..... **B•1712-1716**

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CTS CORPORATION, Systems Division, 6900 Shady Oak Rd., Eden Prairie, MN 55344, Tel: 612-941-9100, TWX: 910-576-2913; FSC No.: 21542; Empl.: 1400; *Sls. Mgr.:* S. Beyl

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CTS CORPORATION, Tool, Die & Machine Division, 3000 Engle Rd., Fort Wayne, IN 46809, Tel: 219-747-0531

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CTS OF CANADA, LTD., 80 Thomas St., Streetsville, Ontario, Can. L5M 1Y9, Tel: 416-826-1141

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CTSI INTERNATIONAL INC., 75 Mall Drive, Commack, NY 11725-5703, Tel: 516-864-5260, FAX: 516-864-5878; Empl.: 50; *Sls. Mgr.:* Paul Onish

CUBIT, Div. of Proteus Industries. Inc., 340 Pioneer Way, Mountain View, CA 94041, Tel: 415-962-8237, FAX: 415-965-9355; Empl.: 27; *Sls. Mgr.:* Jon Heiner

CUESTA SYSTEMS CORPORATION, 3440 Roberto Ct., San Luis Obispo, CA 93401, Tel: 805-541-4160, 800-332-3440, TELEX: 4949381 CUESTA; *Sls. Mgr.:* Gary Brehmer

CUNO, INC., Process Filtration Products, 400 Research Pkwy., Meriden, CT 06450, Tel: 203-237-5541, TELEX: 221083; Empl.: 700

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CURRENT RING CO. INC., 252 Sunset Drive, P. O. 1525, Ballwin, MO 63011, Tel: 800-325-8653, FAX: 314-423-5637; *Sls. Mgr.:* Peter Racen; *Dist. Mgr.:* Peter Racen

CURRENT TECHNOLOGY, INC., 1400 S. Sherman, 6202, Richardson, TX 75081, Tel: 214-238-5300, FAX: 214-238-0911; *Sls. Mgr.:* Barry Epstein; *Dist. Mgr.:* Peter Diamond

CURTIS ELECTRO DEVICES, INC., Box 4090, Mountain View, CA 94040, Tel: 415-964-3846, FAX: 415-964-3574; Empl.: 10; *Sls. Mgr.:* P. Curtis

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FAX: 414-535-1150

CURTIS INDUSTRIES, 7400 W. Douglas Ave., P.O. Box 18699, Milwaukee, WI 53218-0699, Tel: 414-535-1500, TWX: 910-262-3035; FSC No.: 73631; Empl.: 160; *Sls. Mgr.:* W.M. Tennie; *Dist. Mgr.:* Al Hungsberg ..... **A•1646-1647; C•1318-1319**

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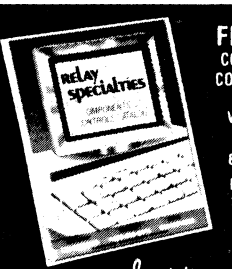

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CT	New Fairfield, Sales Engrg. Co.	203-746-5604
FL	Clearwater, Tech-Rep Assocs.	813-576-9900
GA	Doraville, Advanced Comps. Mktg.	404-448-7025
IL	Downers Grove, Richmar Elctrns. Corp.	312-968-0118
MD	Gaithersberg, Naudain Assocs., Southern	301-258-5040
MI	Grand Rapids, JFCO, Inc.	616-949-1020
MI	Lake Orion, JFCO, Inc.	313-693-2053
MN	Minneapolis, Holmgren Assocs. Inc. of MN	612-786-7641
MO	Bridgeton, Dy-Tronix, Inc.	314-291-4777
NH	Salem, Sales Engrg. Co.	603-893-5521
NJ	Englewood, Harold Gray Assocs., Inc.	201-894-0894
NJ	Marlton, Naudain Assocs.	609-983-5300
NY	Rochester, Apex Assocs.	716-254-6050
NC	Raleigh, Crossroads Elctrn. Assocs.	919-742-2372
OH	Columbus, Nationwide Comps., Inc.	216-946-3226
OH	Dayton, Nationwide Comps., Inc.	216-946-3226
IN	Indianapolis, Nationwide Comp., Inc.	317-872-7202
OH	Willoughby, Nationwide Comp.	216-946-3226
RI	Warwick, Sales Engrg.	401-738-1319
TX	Arlington, ProComp Sls. Co.	817-640-4336
TX	Richardson, Pro Comp	214-669-1500
WA	Redmond, Electronic Mktg. Grp.	206-883-0962
WI	Milwaukee, Richmar Elctrns.	414-781-1730
Can	Ontario, Chartwell Elctrns.	416-477-0400
	Local Distributors	
CA	Anaheim, Control Design	715-821-1516
CA	San Carlos, Control Design Supp.	415-592-4806
CA	Santa Monica, Master Distrs.	213-452-1229
CA	So. San Francisco, Steven Engrg.	415-588-6121
FL	Lakeland, A-A Electric	813-665-6941
GA	Atlanta, A-A Electric	404-449-8670
IL	Carol Stream, Lectro Comps.	312-690-0520
IL	Wooddale, Electro-Kinetics	312-595-6700
IA	Marion, Control Des. Supp.	319-373-2923
IA	West Des Moines, Ramco	515-225-6933
MD	Gaithersburg, Deanco	301-948-5444
MN	Minneapolis, Control Design	612-721-1628
MN	Minneapolis, Sterling Elctrns.	612-831-2666
MN	St. Paul, Shelley-Ragon, Inc.	612-642-9427
MO	Kansas City, L-Comp, Inc.	816-221-2400
MO	St. Louis, Control Design	314-426-3150
NH	Nashua, Brevan, Inc.	603-889-7230
NJ	Oakland, Relay Specialties	201-337-1000
NJ	W. Berlin, General Comps.	609-768-6767
OH	Cleveland, Gateway Megatech	216-944-5801
PA	McKean, Advacom	814-476-7774
SC	Columbia, Dixie Elctrns.	803-779-5332
WI	Cedarburg, A-A Electric	414-377-8000
WI	Milwaukee, Marsh Elctrns.	414-475-6000
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CO	Littleton, Grifco	303-795-1989
FL	Longwood, NSL Assocs.	305-629-5226
IL	La Grange Park, Bierhaus Sls.	312-354-5100
IN	Ft. Wayne, Aktron Sls.	219-747-3650
MA	Brookline, Harman Assocs.	617-232-6687
MN	Minnetonka, S. J. Collins	612-933-7661
NY	Manhasset, WinCor Elctrn. Sls. Corp.	516-627-9474
OH	Chagrin Falls, K. F. Nauerz	216-338-8450
WA	Seattle, Evergreen Mktg.	206-633-3160
WI	Milwaukee, Bierhaus Sls.	414-963-0318
	Local Distributors	
MO	St. Louis, Acorn Elctrns. Inc.	314-644-2510
PA	Newton Sq., W. Reeves Assocs.	215-356-7500
TX	Carrollton, Lektron	817-464-7784

CUSTOM BOBBIN WINDINGS, A & K Corporation, P.O. Box 2369, Zanesville, OH 43702-2369, Tel: 614-452-6973, FAX: 614-452-4156; Empl.: 20

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CUSTOM CONNECTOR, 1738 E. 30th St., Cleveland, OH 44114, Tel: 216-241-1679, FAX: 216-241-1734; Empl.: 24; *Sls. Mgr.:* Larry Weider

CUSTOM ELECTRONICS, Browne St., Oneonta, NY 13820, Tel: 607-432-3880, FAX: 607-432-3913; FSC No.: 23280; Empl.: 130; *Sls. Mgr.:* D. Hathaway

CUSTOM LOGIC, PO Box 4092, Crestline, CA 92325, Tel: 714-338-4059, FAX: 714-338-4450

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CUSTOM POWER SYSTEMS, INC.

FAX: 516-467-5066

CUSTOM POWER SYSTEMS, 33 Comac Loop, Ronkonkoma, NY 11779-9990, Tel: 516-467-5328; Empl.: 12 **D•1715**

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CA	San Jose, NES	408-293-2600
MD	Hunt Valley, Eagle Sls. Corp.	301-666-3930
MA	Wayland, Daner-Hayes Inc.	617-655-0888
MI	Plymouth, Leading Edge Sls.	313-420-3344

CUSTOM SCI. INSTRS., 13 Wing Dr., Cedar Knolls, NJ 07927, Tel: 201-538-8500, FAX: 201-984-6793; Empl.: 47; *Sls. Mgr.:* Henry Piekarski

CUT CRAFT, INC., 1500 Northpark Dr., Ste. 200, Ft. Worth, TX 76102, Tel: 817-332-6151, FAX: 817-332-3304; Empl.: 30; *Sls. Mgr.:* Fred A. Antonini **C•1697, 1733**

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CVC PRODUCTS, INC., 525 Lee Rd., Rochester, NY 14603, Tel: 716-458-2550, TELEX: 265240, TWX: 4947142, FAX: 716-458-0424; Empl.: 160; *Sls. Mgr.:* Steven Rothstein

CW INDUSTRIES, 130 James Way, Southhampton, PA 18966, Tel: 215-355-7080, TELEX: 831470, FAX: 215-355-1088; FSC No.: 79727; Empl.: 450; *Sls. Mgr.:* Michael Klakis **B•1718-1719; C•1320-1323**

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CA	Simi Valley, Tri-Electro Sls., Inc.	805-527-3317
CO	Castle Rock, Wesmar	303-660-0642
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FL	Melbourne, Southern Elctrn. Sls. Grp.	407-242-9661
IL	Park Ridge, G. Mcl. Cole Co.	312-692-6040
IN	Greenfield, France Entprs.	317-462-6098
IN	Indianapolis, Schank Elctrn. Mktg., Inc.	317-842-6204
MD	Owings Mills, Walker-Houck Assoc.	301-356-9500
MA	Taunton, Focus Elctrn. Sls.	617-824-3840
MN	Minneapolis, Robert W. Marshall Co., Inc.	612-929-0457
NJ	Englewood Cliffs, Ed Glass Assocs.	201-592-0200
NY	Pittsford, Franklin Sls.	716-248-8251
NC	Raleigh, Godwin Assocs.	919-878-8000
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WA	Bellevue, Eltech	206-643-4330
Can	Islington, Ont., Pipe-Thompson, Ltd.	416-236-2355
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CA	Los Angeles, Elec. Switches	213-660-1310
CA	Santa Clara, Components Ctr.	408-988-3751
CA	Santa Clara, Pyramid Elctrns.	408-727-9810
CA	Sunnyvale, Bell Inds.	408-745-0400
CA	Torrance, Kent Elctrns.	213-320-2700
CT	South Windsor, Car-Lac Elctrns.	203-282-0631
FL	Stuart, Microwave Comps., Inc.	407-286-4455
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IL	Wheeling, Hawk Elctrns., Inc.	312-459-4030
IN	Indianapolis, Bell Inds.	317-634-8202

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CYBERPAK CO., 905 W. Hillgrove Ave., La Grange, IL 60525, Tel: 312-354-0012; Empl.: 5; *Sls. Mgr.:* Denise Buchman

CYBER SYS., INC., 2570 E. Cerritos Ave, Anaheim, CA 92806, Tel: 714-722-2051, TELEX: 692-375, FAX: 714-937-1955; Empl.: 35

CYCLO-TRONICS, INC., 1345 N. Old Rand Rd., Wauconda, IL 60084, Tel: 312-526-0800; Empl.: 10

THE CYLIX CORPORATION, 2637 Townsgate Rd., Ste. 200, Westlake Vl, CA 91361, Tel: 805-379-3155, FAX: 805-379-4551; FSC No.: 59; Empl.: 15; *Sls. Mgr.:* William J. Purcell; *Dist. Mgr.:* Peter Norman

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CYTEC CORP., 2555 Baird Road, Penfield, NY 14526, Tel: 716-381-4740, 800-346-3117; Empl.: 20; *Sls. Mgr.:* Harry Turner ..... **D•1241**

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MI Oak Pk., Newark Elctrns. 313-967-0600
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OH Dayton, Stotts-Friedman Co. 513-298-5555
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OH Valley View, Newark Elctrns. 216-447-8860
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OK Tulsa, Radio, Inc. 918-587-9123
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OR Beaverton, Hamilton/Avnet 503-526-6209
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DALE ELECTRONICS, INC., El Paso Div., P.O. Box 26728, El Paso, TX 79926-6728, Tel: 915-592-3253; FSC No.: 91637; Empl.: 272; *Sls. Mgr.:* Douglas Wagenknecht; *Dist. Mgr.:* Jerry Jilek ..... **A•1925-1928, 1940-1942; B•1890-1893**

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DALE ELECTRONICS, INC., Norfolk Div., 2300 Riverside Blvd., Norfolk, NE 68701-2242, Tel: 402-371-0080; FSC No.: 91637; Empl.: 1200; *Sls. Mgr.:* Jim Filips; *Dist. Mgr.:* Jerry Jilek ..... **A•1929-1936, 1940-1943**

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FL Melbourne, Repcom 305-254-1877
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MD	Severna Park, New Era Sls.	301-544-4100
MA	Needham Heights, Todino Engrg. Sls., Inc.	617-444-7925
MI	Livonia, Amtech Reps., Inc.	313-474-8300
MN	Minneapolis, Loren Green	612-571-6666
NJ	Englewood, Gray Assocs.	201-894-0894
NY	Brooklyn, Schwartz, HY	718-266-1526
NY	Syracuse, I.A. Hotze Assocs.	315-455-8807
OH	Chargin Falls, John J. Bair & Assocs.	216-247-8244
PA	Newton Square, Hagy Assocs.	215-459-0504
PA	Southeastern, Quality Comps. Co.	215-687-3553
TX	Plano, Richmar Elctrns.	214-424-8388
TX	Round Rock, Richmar Elctrns.	512-255-2551
WI	Butler, Richmar Elctrns.	414-781-1730

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DATA DELAY DEVICES, 3 Mount Prospect Ave., Clifton, NJ 07013-1915, Tel: 201-773-2299 ..... **A•1541-1555**

Local Sales Offices & Reps

AL	Huntsville, Mountain Electro Prods.	205-533-0084
AZ	Phoenix, Tech Sls., Inc.	602-246-1614
AR	R-Squared	713-820-3210
CA	El Toro, Martronix	714-858-0632
CA	Mountain View, Weseloh/Swanson & Assocs.	415-961-0565
CT	Dynamic Sls., Inc.	617-272-5676
DE	Jack McCoy Assocs.	215-363-0350
FL	Casselberry, Southern Elctrns. Mktg.	407-332-4718
GA	Stone Mountain, Mountain Electro Prods., Inc.	404-448-5594
IN	J. M. Finnegan & Co.	216-238-5905
KY	J. M. Finnegan & Co.	216-238-5905
LA	R-Squared	713-820-3210
ME	Dynamic Sls., Inc.	617-272-5676
MA	Burlington, Dynamic Sls., Inc.	617-272-5676
MI	Grand Rapids, Jim Finnegan & Co.	616-245-4621
MS	Mountain Electro Prods.	404-448-5594
NH	Dynamic Sls., Inc.	617-272-5676
NJ	Medford, Jack McCoy Assocs.	609-953-0770
NY	Pittsford, James E. Zimmmerman Sls.	716-381-3186
NC	Durham, Mountain Electro Prods.	919-383-9839
OH	Vandalia, Jim Finnegan & Co.	513-890-8322
OK	R-Squared	713-820-3210
PA	Downingtown, Jack McCoy, Inc.	215-363-0350
PA	Pittsburgh, Jim Finnegan & Co.	412-823-5400
RI	Dynamic Sls., Inc.	617-272-5676
SC	Mountain Electro Prods.	404-448-5594
TN	Mountain Electro Prods,	404-448-5594
TX	Houston, R-Squared	713-820-3210
VT	Dynamic Sls., Inc.	617-272-5676
VA	Jim Finnegan & Co.	216-238-5905
Can	Ont., Source Elctrns.	416-676-0830

Local Distributors

CA	Sunnyvale, Target Elctrns.	408-734-5611

DATA-DESIGN LABS., P.O. Box 711, 7925 Center Ave., Cucamonga, CA 91730, Tel: 714-987-2511; Empl.: 1400; *Sls. Mgr.:* M. L. Sneller

DATA DEVICE CORP., See ILC Data Device Corp.

DATA DISPLAY PRODUCTS, Box 91072, Los Angeles, CA 90009, Tel: 213-640-0442, FAX: 213-640-7639; FSC No.: 15513; Empl.: 35; *Sls. Mgr.:* Peggy Stevens

DATA ENGINEERING, INC., 2515 N. State Rd. 7 Ste. 207, Margate, FL 33063, Tel: 305-971-0400

DATA INSTRUMENTS, INC., 100 Discovery Way, Acton, MA 01720, Tel: 508-264-9550, TELEX: 200081; Empl.: 285; *Sls. Mgr.:* Ernest C. Lutfy ..... **B•1943**

Local Sales Offices & Reps

AL	Huntsville, FLW Southeast, Inc.	205-536-6207
AZ	Scottsdale, Williams Assocs.	602-947-4297
CA	Laguna Hills, Elotek Sys., Inc.	714-830-4856
CA	San Carlos, Elctrn. Engrg. Assocs.	415-593-2189
CO	Englewood, Dynatech, Inc.	303-773-2830
FL	Orlando, FLW Southeast, Inc.	305-894-1100
GA	Marietta, FLW Southeast, Inc.	404-424-1731
IL	Addison, Robert Kanter	312-620-8701
MA	Acton, Data Instrs., Inc.	617-264-9550
MA	Acton, Dave Hannon	617-264-9550
MO	Florissant, Delltron Co.	314-839-0033
MO	Kansas City, Delltron Co.	816-436-6445
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Albany, Robert F. Lamb Co., Inc.	518-869-3355
NY	Buffalo, The Robert F. Lamb Co.	716-827-1111
NY	Rochester, Robert F. Lamb Co., Inc.	716-323-1250
NY	Syracuse, Robert F. Lamb Co., Inc.	315-455-2469
NC	Charlotte, Emco, Inc.	704-372-8281
OH	Sharonville, Production Resources, Inc.	513-777-0400
OH	Worthington, Bob Young	614-431-0412
OK	Tulsa, Bauman Instr. Corp.	918-492-8086
PA	Radnor, Pressure Prods. Inc.	215-688-7795
TN	Memphis, FLW Southeast, Inc.	901-345-3563
TX	Arlington, Collinsystems, Inc.	817-261-2703
TX	Houston, Collinsystem Inc.	713-464-9428
WA	Redmond, S.E.A. Sls.	206-883-4999
WA	Vancouver, S.E.A. Sls.	206-573-5161
Can	Woodbridge, Ont., Technel Engrg. Inc.	416-851-4244

Local Distributors

CO	Lafayette, Big Horn Instrmn.	303-665-4054
CT	Meriden, Meriden Cooper	203-237-8448
GA	Columbus, Wetherbee Elec. Supp. Inc.	404-568-0157
IL	Rockford, Power/mation	815-397-0510
IN	Indianapolis, J. N. Fauver Co., Inc.	317-872-3060
MA	Billerica, Tanyx Meas. Inc.	617-671-0183
MI	Kalamazoo, North Cen. Engrg., Inc.	616-349-3010
MI	Midland, North Cen. Engrg., Inc.	517-631-3274
MI	Taylor, North Cen. Engrg., Inc.	313-942-942-0900
MN	St. Paul, Power/mation	612-645-0781
MO	Kansas City, ISL Corp.	816-587-5400
MO	St. Louis, ISL Corp.	314-535-5760
NY	Albany, KOM Lamb Inc.	518-382-1044
NY	Buffalo, KOM Lamb Inc.	716-874-3530
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NC	Charlotte, EMCO	704-372-8281
OH	Sharonville, Production Resources, Inc.	513-777-0400
OH	Twinsburg, The Stanley M. Proctor Co.	216-425-7814
OR	Portland, Brancom Instr.	503-283-2555
UT	Salt Lake City, Rust Automation Equip.	801-486-9865
WA	Colbert, Branom Instr.	509-466-9365
WA	Seattle, Branom Instr.	206-762-6050
WI	Green Bay, Power/mation	414-496-0944
WI	Waukesha, Power/mation	414-542-2868

DATA I/O CORP., 10525 Willows Rd. N.E., Redmond, WA 98073-9746, Tel: 206-881-6444, TELEX: 15-2167; Empl.: 550

DATAK CORP., 3117 Paterson Plank Rd., N. Bergen, NJ 07047, Tel: 201-863-7667, FAX: 201-863-4199; *Sls. Mgr.:* Theresa Pflueger ..... **C•1584, 1726**

Local Sales Offices & Reps

AL	Birmingham, Henry W. Phillips Co., Inc.	205-979-3572
CA	City of Industry, Don Forth Assocs.	818-333-8009
CA	Foster City, Polach & Bensinger	415-578-8200
CO	Denver, MKP Mktg., Inc.	303-759-5661
FL	Lauderdale Lakes, Seacom Sls. Co., Inc.	305-486-0260
GA	Roswell, Henry W. Phillips Co.	404-992-3070
IL	Des Plaines, Manx Co.	312-299-6269
IN	Indianapolis, Elmarcon, Inc.	317-846-0221
MD	Silver Spring, Mid-Atlantic Sls.	301-593-7749
MI	Grand Blanc, Inter-Comm, Inc.	313-695-0665
MO	Raytown, Marty Taraski Sls.	816-358-1442
NC	Statesville, Henry W. Phillips Co., Inc.	704-876-0730
OH	Chagrin Falls, L.W. Bennett & Assoc.	216-247-2174
OR	Portland, Jos. V. Belusko	503-222-4279
PA	Philadelphia, Instrmn. Specialties	215-742-0898
RI	Coventry, Adams McGregor	401-726-1300
TX	Dallas, J & J Sls. Co.	214-328-9739

Local Distributors

AL	Birmingham, ACK Radio Supp. Co.	205-322-0588
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AZ	Tempe, Circuit Specialists	602-966-0764
AZ	Tucson, Inland Elctrns.	602-889-5301
CA	Milpitas, Zack Elctrns.	408-942-5432
CA	Pasadena, Dow Radio	818-793-1196
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CA	Sunnyvale, Fry's Elctrns.	408-733-1770
CA	Thousand Oaks, Pace Elctrns.	805-497-7515
CA	Van Nuys, All Elctrns.	818-333-8009
CO	Denver, Gateway Elctrns.	303-458-5444
CT	Greenwich, Wise Comps.	203-531-4880
CT	Hartford, Hatry Elec.	203-527-1881
CT	Wallingford, Tron Town U.S.A.	203-237-5598
DE	Wilmington, Wholesale Elctrns.	302-656-9988
FL	Miami, Elctrn. Equip.	305-871-3500
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GA	Atlanta, Ack Elctrn. Supp.	404-351-6340
GA	Atlanta, Specialty Distrb. Co.	404-873-2521
IL	Berwyn, B-B & W, Inc.	312-749-1710
IL	Mt. Prospect, Tri-State Elec.	312-255-0600
IL	Niles, Joseph Elec.	312-297-4200
IL	Peoria, Klaus Radio, Inc.	309-691-4840

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MO	St. Louis, Gateway Elec.	314-427-6116
MO	St. Louis, Van Sickle	314-621-5000
NE	Lincoln, Scott Elec. Supp.	402-466-8221
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NV	Reno, Elect. Distr. Co.	702-323-2766
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NY	Hauppauge, Broadline Elctrns.	516-231-4100
NY	Plainview, Kelvin Elctrns.	516-349-7620
NY	Rochester, Summit Elec.	716-334-8110
NC	Raleigh, Southeastern Elctrns.	919-828-2311
OH	Cincinnati, URI Elec.	513-761-4030
OH	Columbus, Hughes Peters	513-351-2000
OK	Oklahoma City, Radio Supp.	405-232-6127
OR	Beaverton, Norvac Elec.	503-644-1025
OR	Portland, Portland Radio Supp.	503-228-8647
PA	Braddock, Leff Elctrns.	412-351-5000
PA	Drexel Hill, Kass Elctrns.	215-449-2300
PA	Philadelphia, A.C. Radio	215-462-9379
PA	Reading, Barbey Elctrns.	215-376-6116
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SC	Charleston, Wholesale Inds. Elctrns.	803-722-2634
TN	Memphis, Bluff City Distr.	901-345-9500
TX	Dallas, Electrotex Elect. Corp. of TX	214-234-0433
TX	El Paso, Ideal Indl. Elec. Supp.	915-779-6647
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TX	San Antonio, Altex Elctrns.	512-828-0503
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UT	Salt Lake City, Standard Supp. Co.	801-486-3371
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DATAPOWER INC., Power Systems Div., 3545 Cadillac Ave., Costa Mesa, CA 92626, Tel: 714-754-4400, TWX: 910-595-1560, FAX: 714-754-5407; Empl.: 120; *Sls. Mgr.:* Bob Gomez; *Dist. Mgr.:* Edward Blackman

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DATA PRECISION CORP., Analogic Corp., Electronics Ave., Danvers, MA 01923, Tel: 617-246-1600, TELEX: 6817144; Empl.: 140; *Sls. Mgr.:* Jay Long

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DATAPRODUCTS CORPORATION, 6200 Canoga Ave., Woodland Hills, CA 91365, Tel: 818-888-4014, TELEX: 67-4734, FAX: 818-887-4789; Empl.: 4200; *Sls. Mgr.:* Keith Bauserman; *Dist. Mgr.:* Keith Bauserman

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DATA RACE, INC., 12758 Cimarron Path, San Antonio, TX 78249, Tel: 512-692-3909, TELEX: 517659 RTS TX, FAX: 512-692-7632; Empl.: 28; *Sls. Mgr.:* Garrick C. Colwell

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WA	Bellevue, Olson Tech. Sls.	206-883-7792

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DATASOUTH COMPUTER CORP., 4216 Stuart Andrew, P.O. Box 240947, Charlotte, NC 28224, Tel: 704-523-8500, TELEX: 6843018, FAX: 704-523-9298; Empl.: 160; *Dist. Mgr.:* Ann Vetas, National Accounts Mgr.

DATA SPECIALTIES, INC., See Zebra Technologies Corp.

DATA TECH, DIV. OF PENRIL CORP., See Moisture Register Products Div., Aqua Measure Instrument Co.

DATA TECHNOLOGY, INC., 4 Gill St., Woburn, MA 01811, Tel: 617-935-8820, FAX: 617-935-9656; Empl.: 45; *Sls. Mgr.:* L. Rizzo ..... **B•1945-1947**

Local Sales Offices & Reps

AZ	Paradise Valley, Tech Rep Comps.	602-443-8288
CA	Danville, Tech Rep Comps.	415-866-1705
CA	Lomita, Tech Rep Assocs.	213-539-9070
CA	Tarzana, Tech Rep Comps.	818-708-9161
CO	Englewood, Thorson Rocky Mtn., Inc.	303-799-3435,
FL	Melbourne, R-Rep Co.	305-725-6993
IL	Elk Grove Vl, Carlson Elctrn. Sls.	312-956-8240
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NY	E. Rochester, A & D Dvcs.	716-385-2778
NY	Hawthorne, Swedelco, Inc.	914-747-0101
NY	Sidney, Southern Tier Equip.	607-563-8978
OH	Cincinnatti, Drivex Corp.	513-474-5100
OH	Cleveland, Servo Mark, Inc.	216-871-2353
TX	Dallas, Blackburn Assocs.	214-750-8484,
UT	Salt Lake City, Thorson Rocky Mt.	801-973-7969
WI	Milwaukee, Carlson Elctrn. Sls.	414-476-2790

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DATATRAN CORP., 355 Yuma St., Denver, CO 80223, Tel: 303-778-0870, FAX: 303-778-0877; Empl.: 17; *Sls. Mgr.:* Cindi L. Kemper; *Dist. Mgr.:* Cindi L. Kemper

DATA TRANSLATION, INC., 100 Locke Dr., Marlboro, MA 01752, Tel: 508-481-3700, TELEX: 951646, FAX: 617-481-8620; FSC No.: 61867; Empl.: 270; *Sls. Mgr.:* John Molinari; *Dist. Mgr.:* Michael Travis

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DA-TECH CORP., 141 Railroad Drive, Ivyland, PA 18974, Tel: 215-322-9410; Empl.: 110; *Sls. Mgr.:* Bradford W. Bentz

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DATEL, INC., 11 Cabot Blvd., Mansfield, MA 02048-1194, Tel: 508-339-3000, TELEX: 174388; Empl.: 550; *Sls. Mgr.:* N. Renaud ..... **D•1167-1175**

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AL	Huntsville, Advanced Comps. Mkt.	205-881-5493
AZ	Phoenix, Tech. Sls.	602-246-1614
CA	Santa Ana, Datel	714-835-2751
CO	Denver, Elcom, Inc.	303-337-2300
CT	Southbury, Dynamic Technlgs.	203-262-6220
FL	Coral Springs, H. A., Inc.	305-752-7520
GA	Norcross, Advanced Comps. Mktg.	404-448-7025
IL	Hoffman Estates, Carvel Engrg. & Sls.	312-885-8800
IA	Cedar Rapids, Ensco-Rep, Inc.	319-396-1109
KS	Wichita, Ensco-Rep Inc.	316-683-1070
MD	Columbia, Delta III Assocs.	301-730-4700
MA	Mansfield, Datel	508-339-3000
MI	Auburn Hgts., Infinity, Inc.	313-853-9880
MN	Edina, Carvel Engrg. & Sls.	612-835-7929
MO	Maryland Heights, Ensco-Rep, Inc.	314-423-3935
NJ	Fairfield, ASTROREP, Inc.	201-808-0025
NM	Albuquerque, S & S Technlgs. Inc	505-255-5599
NY	Babylon, Astrorep	516-422-2500
NY	Clark Mills, KLM-Garner	315-853-6126
OH	Cleveland, Arthur Baier Co.	216-461-6161
PA	Feasterville, Knowles Assocs.	215-322-7100
PA	Pittsburgh, Arthur Baier Co.	412-367-7799
TX	Carrollton, Tech. Mktg., Inc.	214-387-3601
UT	Salt Lake City, Elcom, Inc.	801-486-4233
WA	Bellevue, Advanced Power Comps.	206-527-7945
WA	Seattle, Advanced Power Comps.	206-747-9127
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Can	Lachine, Quebec, Vitel Elctrns.	514-636-5951
Can	Mississauga, Ontario, Vitel Elctrns.	416-676-9720

Local Distributors

AL	Huntsville, Magaro & Assocs.	205-882-0827
FL	Orlando, Magaro & Assocs.	407-859-6546
GA	Atlanta, Magaro & Assocs.	404-451-8862/8876
NC	Greensboro, Magaro & Assocs.	919-294-4783

DATRON INSTRUMENTS, A Wavetek Company, Hurricane Way, Norwich, England, United Kingdom NR6 6JB, Tel: 603-404824, TELEX: 851975173, FAX: 603-483670

DATRON INSTRS., INC., 3401 SW 42nd Ave., Stuart, FL 33497, Tel: 305-283-0935, TELEX: 525724; FSC No.: 66-15b,66-23F,66 Part II SECT H, J; Empl.: 120; *Sls. Mgr.:* Irene Bugno

DATRON SYSTEMS, INC., 200 West Los Angeles Ave., Simi Valley, CA 93065-1650, Tel: 805-584-1717, TWX: 910-494-2787, FAX: 805-526-0885; FSC No.: 32255; Empl.: 160; *Sls. Mgr.:* Bruce Strean, VP Mktg.

DATUM INC., Timing/Aacom Divisions, 1363 S. State College Blvd., Anaheim, CA 92806-5790, Tel: 714-533-6333, TELEX: 4722045 (intl.), TWX: 910-592-1289; FSC No.: 31160; Empl.: 280; *Sls. Mgr.:* Charles Neumann ..... **D•1066, 1176**

Local Sales Offices & Reps

AL	Huntsville, Southern Mktg. Assocs. Ltd.	205-534-6020
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CA	San Diego, M. Ficken	619-292-9392
CA	Santa Clara, Ward/Davis Assocs.	408-245-3700
CO	Aurora, Vic Meyers Assocs. Inc.	303-629-9676
CT	Mt. Carmel, Scientific Dvcs.- Connecticut	203-248-9361
FL	Longwood, Southern Mktg. Assocs. Ltd.	407-682-7317
FL	Satellite, Southern Mktg. Assocs. Ltd.	407-777-3587
GA	Marietta, Southern Mktg. Assocs. Ltd.	404-565-0603
IL	Des Plaines, Marsland Assocs.	312-298-2620
IN	Indianapolis, Marsland Assocs.	317-293-5437
MA	Waltham, Scientific Devices-New England	617-890-2252
MA	Wayland, Daner-Hayes	508-655-0888
WI	New Berlin, Marsland	414-786-6611
MN	Minneapolis, Marsland Assocs.	612-545-4481
MO	St. Louis, Marsland Assocs.	314-991-1399
NJ	Haddonfield, G. L. Williams Assocs.	609-428-6060

NM Albuquerque, Vic Meyers Assocs. Inc. 505-884-6878
NC Greensboro, Southern Mktg. Assocs. Ltd. 919-854-5588
OH Dublin, Micro Sls. Corp. 614-792-9117
OH No. Olmsted, Micro Sls. Corp. 216-734-3080
OK Tulsa, Data Mktg. Assocs. 918-494-2711
TX Austin, Data Mktg. Assocs. 512-338-4701
TX Dallas, Data Mktg. Assocs. 214-661-0300
TX Houston, Data Mktg. Assocs. 713-954-5020
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MD Rockville, Creative Mktg. Assocs. 301-251-4100
WA Seattle, Comptronics 206-284-4842

DAVIDGE CORPORATION, 94 Commerce Dr., Buellton, CA 93427, Tel: 805-688-9598, FAX: 805-688-3306; *Sls. Mgr.:* Dean Davidge

DAVIES, HARRY, MOLDING CO., 4920 Bloomingdale Ave., Chicago, IL 60639, Tel: 312-622-8966; FSC No.: 72512; Empl.: 113; *Sls. Mgr.:* Leo A. Sera; *Dist. Mgr.:* Leo A. Sera

DAYCO PRODUCTS, INC., P.O. Box 1004, Dayton, OH 45401-1004, Tel: 513-226-5923, TELEX: 288219, TWX: 810-459-1822; Empl.: 4500

DAYTRONIC CORP., Hawker Siddeley, 2589 Corporate Pl., Miamisburg, OH 45342, Tel: 513-866-3300, TWX: 810-473-2978, FAX: 513-866-3327; Empl.: 180; *Sls. Mgr.:* John A. Perkins

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D-B-DEVELOPMENTS, 201 Mill St., Rome, NY 13440 Tel: 315-338-2184; Empl.: 3

DCI INC., 14812 W. 117th Street, P.O. Box 215, Olathe, KS 66061, Tel: 913-782-5672, FAX: 913-782-5766; FSC No.: 58677; Empl.: 25; *Sls. Mgr.:* Larry Shelton ..... **B•1061; D•1380**

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CA Mtn. View, XEL 415-969-1222
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GA Lawrenceville, Saber Assocs. 800-327-0853
IL Chicago, Commodore I 312-394-5441
MO Raytown, Vertec 816-737-0377
MA Marchfield, R. G. Assocs. 617-837-3290
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MO Manchester, Vertec 314-394-6242
NJ Marlton, Analectro, Inc. 609-983-1088
NJ Scotch Plains, Analectro 201-396-8310
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NY Pittsford, L-Tron 716-383-0050
NC Clayton, Saber Assocs. 800-327-0853
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OH Dayton, Bradcor 513-294-5477
TX Dallas, Meas. Sys. & Sls. 214-934-0247
VA Alexandria, Analectro 703-922-4317
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DEAK TECHNOLOGY, INC., See Elpaz Instruments, Inc.

DE ANZA MFG. & SVCS. INC., 310 E. Caribbean Dr., Sunnyvale, CA 94089, Tel: 408-734-2020, FAX: 408-734-2580; FSC No.: 5935 & 5965; Empl.: 100; *Sls. Mgr.:* Michael A. Takahara

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DE COURSEY ENGINEERING LABORATORY, 11828 W. Jefferson, Culver City, CA 90230, Tel: 213-EX7-9668; Empl.: 7

DEGUSSA CORP., Temperature Sensing Products, 104 New Era Drive, So. Plainfield, NJ 07080, Tel: 201-757-6500, TELEX: 4754247, FAX: 201-757-8561; FSC No.: 630673043; *Sls. Mgr.:* David W. Molnar

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MN Maple Grove, Pyramid Controls 612-420-7579
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GA Atlanta, Technlg. Mktg. Assocs., Inc. ... 404-446-3565
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CA San Diego, Pyramid Elctrns. 619-271-5404
CA San Diego, Sigma Elctrns. 619-565-2000
CA San Jose, Compass Comp. 408-432-7575
CA San Jose, Sierra West 408-435-7477
CA Santa Clara, Cypress Elctrns. 408-980-2500
CA Santa Clara, Pyramid Elctrns. 408-727-9810
CO Wheatridge, Added Value Elctrns. 303-422-1701
CO Wheatridge, Cypress Elctrns. 303-431-2622
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GA Norcross, Hammond Elctrns. 404-449-1996
MD Beltsville, Pertricko Sls. 301-937-4960
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CA Santa Clara, Gagner-Toomey Assocs. 408-244-2200
CO Boulder, Front Range Mktg. 303-443-4780
CT Bloomfield, Wood Sls. Corp. 203-243-0457
FL Deerfield Bch., Jack Krutek & Assocs. 305-427-4202
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IL Elk Grove Village, Tristar Group 312-593-0200
IN Wannamaker, Nationwide Comps. 317-872-7207
MA Wakefield, Wood Sls. Corp. 617-245-8300
MN St. Paul, Kencotronics, Inc. 612-645-7717
MO Chesterfield, Weisler & Assocs. 314-537-0010
NY Pt. Washington, Ashtec Inc. 516-767-0336
NY Rochester, Omni Sls. 716-342-5270
NC Pineville, JWL Assocs. 704-541-5750
OH Willoughby, Nationwide Comps. 216-946-3226
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CT Hartford, Hatry Elctms. 203-527-1881
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FL Orlando, EMSCO 407-849-6362
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IA Dubuque, Miller Elec. Supp. 319-588-1469
IA Marion, Control Des. 319-373-2923
IA West Des Moines, Ramco Co. 515-225-6933
KS Kansas City, Kornfield Thorp Elec. 913-321-7070
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FAX: 213-534-8419

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CA Irvine, Comp. Mktg. Assocs. 714-951-5950
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FL Margate, E.P.M. Corp. 305-977-0331
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DEXTER RESEARCH CTR., INC., 7300 Huron River Dr., Dexter, MI 48130, Tel: 313-426-3921, TELEX: 757075 DEXTER RES UD; Empl.: 22; *Sls. Mgr.:* Robert Toth Jr.

DEYOUNG MANUFACTURING, INC., 12920 N.E. 125th Way, Kirkland, WA 98034, Tel: 206-823-4798, FAX: 206-821-8633; FSC No.: 54937; Empl.: 70; *Sls. Mgr.:* Ted Johnson

DGH CORPORATION, P. O. Box 5638, Manchester, NH 03108, Tel: 603-622-0452, TWX: 510 601 6112, FAX: 603-622-0487; Empl.: 10

DH PRINT, Technical Research Park, Riverton, WY 82501, Tel: 307-856-4821, TWX: 910-949-4864, FAX: 307-856-0412; Empl.: 185; *Sls. Mgr.:* Rich Phillips; *Dist. Mgr.:* Rich Phillips

DIAGOSTIC INSTRUMENT CORP., 4 Copeland Dr., Box J, Ayer, MA 01432, Tel: 508-772-4572, FAX: 508-772-5210; Empl.: 125; *Sls. Mgr.:* Brad Barone

DIALIGHT CORP., A Cambridge Elctrns. Inds. Co., 1913 Atlantic Ave., Manasquan, NJ 08736, Tel: 201-223-9400, TELEX: 244536, FAX: 201-223-8788; Empl.: 400; *Sls. Mgr.:* W. Moore ..... **B•1065, 1133-1141**

Local Sales Offices & Reps

AL	Huntsville, Cartwright & Bean	205-830-1540
AZ	Phoenix, Shefler-Kahn Co.	602-257-9015
CA	Los Angeles, Landa & Assocs.	213-879-0770
CA	Pleasanton, Moulthrop Sls.	415-463-0450
CA	Santa Ana, Landa & Assocs.	714-543-7805
CO	Boulder, Comp. Prods. Sls.	303-530-2800
FL	Ft. Lauderdale, Panamtech, Inc.	305-587-3769
GA	Norcross, Cartwright & Bean	404-368-0160
IL	Rolling Meadows, Sumer, Inc.	312-991-8500
IN	Indianapolis, Elctrn. Reps.	317-894-1414
KS	Shawnee Mission, Lowell Kangas & Assocs.	913-631-3515
LA	Covington, Cartwright & Bean	504-892-1780
MA	Hingham, Northeast Reps., Inc.	617-749-8700
MI	Royal Oak, Hilltronics	313-435-0920
MN	Minneapolis, Professional Sales For Ind.	612-944-8545
MS	Jackson, Cartwright & Bean	601-981-1170
MO	St. Louis, Lowell Kangas & Assocs.	314-821-4050
NY	Liverpool, Gen-Tech	315-451-3480
NY	Melville, Parallax	516-351-1000
NC	Charlotte, Cartwright & Bean	704-536-0303
NC	Raleigh, Cartwright & Bean	919-876-4130
OH	Dayton, Baehr, Greenleaf & Assocs.	513-439-0724
OH	Westlake, Baehr, Greenleaf & Assocs.	216-892-1770
OH	Worthington, Baehr, Greenleaf & Assocs.	614-847-0220
OR	Beaverton, Earl & Brown Assocs.	503-643-5500
PA	Broomall, L.D. Lowery	215-356-5300
PA	Evans City, Baehr, Greenleaf & Assocs.	412-776-2151
TN	Knoxville, Cartwright & Bean	615-693-7450
TN	Memphis, Cartwright & Bean	901-362-8345
TX	Austin, Tesco	512-834-8374
TX	Dallas, Tesco	214-553-1200
UT	Woodscross, Comp. Prods. Sls.	801-292-8882
WA	Redmond, Earl & Brown Assocs.	206-885-5064

Local Distributors

AZ	Tempe, Bell Inds.	602-966-7800
AR	Little Rock, Carleton-Bates Co.	501-562-9100
CA	Alhambra, Harper S.I.D.	213-289-0255
CA	Buena Pk., Cypress Elect.	213-744-0355
CA	Compton, Harper;S.I.D.	213-979-5090
CA	Garden Grove, Bell Inds.	714-895-7801
CA	Garden Grove, Richey Western Elec.	714-895-0060
CA	Gardena, Bell Indus.	213-515-1800
CA	Gardena, Cal Switch & Signal	213-770-2330
CA	Inglewood, Newark Elctrns.	213-671-7378
CA	Roseville, Bell Inds.	916-969-3100
CA	Sacramento, Sacramento Elctrns.	916-441-4821
CA	San Diego, Harper S.I.D.	714-560-8545
CA	San Diego, Richey Western Elctrns.	619-271-4511
CA	San Jose, Richey Western	408-432-7100
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CA	Santa Clara, Harper S.I.D.	408-988-6041
CA	Santa Clara, Richey Western Elctrns.	408-727-7411
CA	Sun Valley, Richey Western Elec. Inc.	213-768-3800
CA	Sunnyvale, Arrow Elec.	408-745-6600
CA	Sunnyvale, Bell Indus.	408-734-8570
CA	Sunnyvale, Harper;S.I.D.	408-747-0333
CA	Sunnyvale, Time Elect.	408-734-9888
CA	Thousand Oaks, Bell Inds.	818-340-1940
CO	Denver, CSID Inc.	303-292-9594
CO	Denver, Newark Denver Elctrns.	303-757-3351
CT	Wallingford, Sager Elctrl. Supply	203-265-4600
FL	Ft. Lauderdale, Peerless Radio	305-973-4141
FL	Orlando, Hammond Elctrns.	305-849-6060
FL	Pompano Bch., Peerless Radio	305-973-4141
GA	Atlanta, Dow Elec.	404-873-2521
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Northbrook, Classic Comps. Supp.	312-272-9650
IL	Palatine, OHM Elctrns.	312-359-5500
IL	Peoria, Klaus Radio & Elect.	309-691-4840
IN	Ft. Wayne, Bell Inds./Graham Elctrn. Div.	219-423-3422
IN	Indianapolis, Bell Inds./Graham Elctrn. Div.	317-634-8202
IN	Indianapolis, PEI-Genesis	317-637-5571
IN	South Bend, PEI-Genesis	219-287-2911
KY	Louisville, P.I. Burks	502-589-3960
LA	Lafayette, Ralph's of Lafayette	318-234-0105
LA	New Orleans, Southern Radio Supp.	504-524-2343
MD	Gaithersburg, Pioneer Washington Elec.	301-948-0710
MD	Rockville, Capitol Radio Whlsrs.	301-881-2270
MD	White Marsh, Resco/Baltimore	301-529-0500
MA	Hingham, Sager Elec. Supp.	617-749-6700
MA	Norwood, Gerber Elctrns.	617-769-6000
MA	W. Springfield, T.F. Cushing	413-788-7341
MA	Wilbraham, Ind'l. Comps.	413-596-3854
MI	Ann Arbor, Wedemeyer Elctrn. Supp.	313-665-8611
MI	Livonia, RS Elctrns.	313-525-1155
MI	Oak Park, Newark Elctrn.	313-967-0600
MN	St. Paul, Gopher Elctrns.	612-483-3322
MO	Kansas City, LCOMP	816-221-2400
MO	Kansas City, Walters Radio Supp.	816-531-7015
MO	Maryland Hgts., LCOMP	314-291-6200
NE	Lincoln, Scott Elctrn. Supp.	402-466-8221
NJ	Hanover, State Elctrns.	201-887-2550
NJ	Kenilworth, Federated Purchaser	201-272-0505
NJ	Pennsauken, Resco Elctrns.	609-662-4000
NY	Buffalo, Summit Dists.	716-887-2800
NY	Elmsford, Ancar Elctrns. Supp.	914-592-7100
NY	Endwell, ASI Elect.	607-754-3823
NY	Hauppauge, Broadline Elec. Dists.	516-231-4123
NY	Long Island City, Dalis Indl. Elect.	718-361-1100
NY	Lynbrook, Peerless Radio	516-593-2121
NY	Melville, Arrow Elctrns.	516-694-6800
NY	Rochester, Summit Elctrns.	716-334-8110
NY	Rome, Rome Elctrns.	315-337-5400
NY	Woodbury, Pioneer Standard	516-921-8700
NC	Greensboro, Hammond Elctrns.	919-275-6391
NC	Raleigh, Southeastern Elctrns.	919-828-2311
OH	Akron, Sun Radio	216-434-2171
OH	Cincinnati, Hughes-Peters	513-351-2000
OH	Cincinnati, URI Elctrns.	513-761-4030
OH	Cleveland, Pioneer-Cleveland	216-587-3600
OH	Columbus, Hughes-Peters	614-294-5351
OH	Dayton, Pioneer/Dayton	513-236-9900
OH	Dayton, Stotts-Friedman	513-298-5555
OH	Solon, REPCO Elctrn.	216-248-8900
OH	Warren, REM Elctrns.	216-373-1300
OK	Tulsa, Radio, Inc.	918-587-9123
OR	Beaverton, Almac Elctrns.	503-629-8090
OR	Lake Oswego, Bell Inds.	503-635-6500
PA	McKean, Advacom	814-476-7774
PA	Montgomeryville, Pyttronic Indus.	215-643-2850
PA	Philadelphia, Almo Elctrns.	215-698-4000
PA	Philadelphia, PEi-Genesis Elctrn.	215-673-0400
PA	Pittsburgh, Cam RPC Elect.	412-782-3770
PA	Reading, Barbey Elctrns.	215-376-7451
RI	Providence, Wm. Dandreta	401-861-2800
SC	Greenville, Emsco	803-233-4121
TN	Kingsport, Radio Elec. Supp.	615-247-8111
TN	Nashville, Carlton-Bates Co.	615-244-3562
TN	Nashville, Electra Dist.	615-256-0800
TX	Austin, Harrison Equip.	512-458-3555
TX	Dallas, Norvell Elctrns.	214-233-0020
TX	Garland, Newark Elctrns.	214-487-8144
TX	Houston, Newark Elctrns.	713-782-4800
TX	Stafford, Harrison Equip.	713-879-2600
UT	Salt Lake City, Standard Supp.	801-486-3371
VA	Norfolk, Priest Elctrns.	804-855-0105
WA	Bellevue, Almac Elctrns.	206-643-9992
WA	Bellevue, Bell Inds.	206-747-1515
WI	Milwaukee, Elctrn. Expeditors	414-228-8100
WI	Milwaukee, Indl. Elect.	414-276-1212
WI	Milwaukee, Marsh Elctrns.	414-475-6000

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DIA-NETICS, INC., 18823 Napa St., Northridge, CA 91324, Tel: 818-886-2616; Empl.: 48

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DIELECTRIC LABS., Rte. 20 E., Cazenovia, NY 13035, Tel: 315-655-8710, TELEX: 882-691 Dielectric Labs., FAX: 315-655-8179; FSC No.: 55153; Empl.: 100; *Sls. Mgr.:* Gunter Vorlop

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FAX: 218-681-3380

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DIGITAL DATA SYSTEMS, 1551 N.W. 65 Ave., Ft. Lauderdale, FL 33313, Tel: 305-792-3290, TWX: 910-997-4751 (Digital), ESYLNK: 62756087, FAX: 305-581-13; FSC No.: 65136; Empl.: 20

DIGITAL DYNAMICS, INC., 5274 Scotts Valley Dr., Scotts Valley, CA 95066, Tel: 408-438-4444; FSC No.: (S.I.C. Code – 3823); Empl.: 15

DIGITAL ELECTRONICS, 31047 Genstar Road, Hayward, CA 94544-7831, Tel: 415-471-4700, TELEX: 172073 DIGELEC HYWD, FAX: 415-489-3500; *Sls. Mgr.:* John W. McKinney, Mktg. VP

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DIGITAL EQUIP., One Iron Way, Marlborough, MA 01752

DIGITAL MOTOR, INC., 13563 N.W. Cornell Rd. Ste. 255, Portland, OR 97229-5892, Tel: 503-629-9692, FAX: 503-641-7266; Empl.: 6

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DIGITAL RADIO CORP., 601 S. Pacific Coast Hwy., Redondo Beach, CA 90277, Tel: 213-316-4114, FAX: 213-543-1256; Empl.: 27; *Sls. Mgr.:* Arvin L. Perry

DIGITEC, 959 Cheney Ave., Marion, OH 43302, Tel: 614-387-3444, TELEX: 3775688; FSC No.: 16152; Empl.: 45; *Sls. Mgr.:* Bruce Poplin; *Dist. Mgr.:* Bruce Poplin

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Local Distributors

AL	Huntsville, Comp. Distrs.	205-883-7501
AL	Huntsville, Powell Elec.	205-539-2731
AZ	Tempe, Powell Elctrns.	602-967-7538
AR	Little Rock, Comp. Distrs.	501-227-6278
CA	Cerritos, El-Com	213-404-2961
CA	Fullerton, Pyramid	714-773-0781, 213-691-0561
CA	San Diego, El-Com	619-578-0900
CA	San Jose, Powell Elctrns.	408-943-9020
CA	Santa Clara, Pyramid Elec.	408-727-9810
CT	Hamden, Impact Elctrns.	203-281-1331
FL	Ft. Lauderdale, Comp. Distrs.	305-971-4950
FL	Ft. Lauderdale, Powell Electr./Fla.	305-972-4300
GA	Norcross, Comp. Distrs.	404-441-3320
IL	Mt. Prospect, Magnuson Elctrns.	312-956-0700
IN	Indianapolis, Graham Elec.	317-634-8202

MD Columbia, Powell Electr. 301-621-4070
MA Canton, Impact Sls. Co. 617-821-1500
MA West Borough, Powell Electrns. 617-336-6100
MI Livonia, Pioneer/Michigan 313-525-1800
MI St. Clair Shores, Specialties Mfg. 313-771-2700
MN St. Paul, Magnuson Elec. 612-227-8495
NJ Hasbrouck Hgts., Tory Sls. 201-288-5656
NY Rochester, Modutex Corp. 716-647-9700
NC Cary, Powell Elec. 919-467-1212
NC Raleigh, Comp. Distrs. 919-834-9465
OH Cleveland, Pioneer-Cleveland 216-587-3600
OH Columbus, Elctrns. Mktg. Corp. 614-299-4161
OH Dayton, Pioneer/Dayton 513-236-9900
OK Tulsa, Norvell Elctrns. 918-663-1247
PA Philadelphia, Powell Electr. 215-365-1900
PA Pittsburgh, Pioneer/Pittsburgh 412-782-2300

DILLON, W. C., Weigh-Tronix, Inc., 1000 Armstrong Dr., Fairmont, MN 56031, Tel: 507-238-4461, TELEX: 756594; Empl.: 700; *Dist. Mgr.:* Randy Newlin

DILOG, 1555 S. Sinclair St., Anaheim, CA 92806, Tel: 714-937-5700, TELEX: 6836051, FAX: 714-978-2420; FSC No.: 95-3205555; Empl.: 105; *Sls. Mgr.:* Dennis Edwards

DILWOL, 3325 North Service Rd., Burlington, Ontario, Canada L7N 3G2, Tel: 416-335-2343, FAX: 416-335-1809; *Sls. Mgr.:* J. R. Mattie

DIMCO-GRAY, 8200 S. Suburban Rd., Dayton, OH 45458, Tel: 513-433-7600, FAX: 513-433-0520; Empl.: 120; *Sls. Mgr.:* R. L. Woehrmyer

DIMENSIONS UNLIMITED, INC., 1636 Gervais Ave., St. Paul, MN 55109, Tel: 612-770-5630; *Sls. Mgr.:* David Flod

DIODES INC., 9957 Canoga Ave., Chatsworth, CA 91311, Tel: 818-882-4920, 800-821-1178

DIONICS, 65 Rushmore St., Westbury, NY 11590, Tel: 516-997-7474, TWX: 510-222-0974, FAX: 516-997-7479; FSC No.: 50857; Empl.: 45; *Sls. Mgr.:* Mel Geffner

DIO-REY, Div. of Info-Lite, 422 Cliff St., Fairview, NJ 07022, Tel: 201-941-4455, FAX: 201-941-4919; FSC No.: FSCM 52116; Empl.: 13; *Sls. Mgr.:* Joseph M. Cartelli; *Dist. Mgr.:* Joseph M. Cartelli ..... **B•1066-1073**

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DISC INSTRUMENTS, Honeywell, 102 E. Baker St., Costa Mesa, CA 92626, Tel: 714-433-0343, TWX: 910-595-1987, FAX: 714-432-7567; Empl.: 150 ..... **B•1949-1951**

Local Sales Offices & Reps

AZ Tempe, Piper Sls. 602-949-0048
CA Costa Mesa, Disc Instrs. 714-433-0300
CA San Jose, Honeywell/Disc Instrs. 408-433-3025
CO Longmont, Piper Sls. 303-443-5337
CT Glastonbury, Honeywell/Disc Instrs. .. 203-659-4011
FL Margate, EPM Corp. 305-977-0331
IL Arlington Hgts., A. L. Whittemore Co. .. 312-364-9670
KS Shawnee Mission, J. F. Gleeson 913-362-4422
MD Glen Burnie, Macrotech Assocs. Ltd. .. 301-766-1111
MA Wilmington, J. F. Shaw Co. 508-658-2550
MI Troy, Disc Instr. 313-649-1340
MO Florissant, J. F. Gleeson 314-921-8446
NJ Saddlebrook, Ribble Engrg. 201-791-0233
NM Albuquerque, Piper Sls. 505-828-1300
NY Hamburg, Application Specialists 716-627-3893
NY Rochester, Application Specialists 716-586-6226
NY Syracuse, Application Specialists 315-437-2814
OH Chagrin Falls, Kilroy Corp. 216-543-3370
OH Dayton, Kilroy Corp. 513-294-1235
TX Dallas, Measurement Sys. & Sls., Inc. 214-934-0247
UT Salt Lake City, Piper Sls. 801-466-9336

DISPLAY DEVICES, INC., Box 667, Encinitas, CA 92024, Tel: 619-753-0113; FSC No.: 26107

DISPLAYS, INC., 31 Industrial Park Rd., Lewistown, PA 17044, Tel: 717-242-2541, FAX: 717-248-8680; Empl.: 65

DISPLAYTECH, INC., 2200 Central Ave., Boulder, CO 80301, Tel: 303-449-8933, FAX: 303-449-8934; Empl.: 17; *Sls. Mgr.:* Ann Perry; *Dist. Mgr.:* Ann Perry

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DISTRIBUTOR & SPECIAL PRODUCTS, Thomson Consumer Electronics, Inc., 2000 Clements Bridge Rd., Deptford, NJ 08096, Tel: 609-853-2525, FAX: 609-853-2231; Empl.: 250; *Sls. Mgr.:* M.J. Cashen; *Dist. Mgr.:* T.R. Boyer

DISTRIBUTOR SPECIALISTS, 1942 14th Street, Santa Monica, CA 90404-4606, Tel: 213-452-3445

DIVERSIFIED CASE CO., Ellis Ave., Off. 2, Whitesboro, NY 13492, Tel: 800-553-2411, 800-258-1188, FAX: 1-315-736-2049; Empl.: 75; *Sls. Mgr.:* Charlie Fisher

DIVERSIFIED ELECTRONICS, INC., P.O. Box 1140, Evansville, IN 47706-1140, Tel: 812-426-2806, FAX: 812-425-8930; Empl.: 55; *Sls. Mgr.:* Ken Qualls

DIVERSIFIED OPTICAL PRODUCTS, INC., Diversified Optical Corp., 282 Main St., Salem, NH 03079, Tel: 603-898-1880, FAX: 603-898-3970; FSC No.: IHT10; Empl.: 47; *Sls. Mgr.:* James A. Greene

DIVERSIFIED TECHNLG., P.O. Box 748, Ridgeland, MS 39157, Tel: 601-856-4121, TELEX: 585326, TWX: 810-966-2626; Empl.: 1000; *Sls. Mgr.:* Walter Chipley; *Dist. Mgr.:* Walter Chipley

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Local Sales Offices & Reps

AL Birmingham, Sesco-Birmingham 404-458-6423
AZ Phoenix, Finn-Pat Co. Inc. 602-954-0301
CA American Canyon, Jacobson & Assocs. 707-552-4412
CA Costa Mesa, FLW 714-751-7512
CA Los Angeles, FLW 818-719-0037
CA Monterey, Adams McDonald-Int'l. 408-373-3607
CA San Diego, FLW 619-434-5251
CO Lakewood, Loritz Controls 303-232-7803
CT Hamden, Pond Tech. Sls. 203-284-1500
FL W. Palm Bch., Sesco-Florida 404-458-6423
GA Atlanta, Sesco-Atlanta 404-458-6423
IL Lombard, Patrick & Douglas 312-971-1800
LA Baton Rouge, Sesco-Baton Rouge 512-892-2490
ME W. Buxton, Pond Tech. Sls. 207-637-2200
MD Crofton, Federal Resources 301-858-1099
MA Waltham, Pond Tech. Sls. 617-890-5535
MI Troy, R. H. Jackson Co. 313-689-9950
MN Minneapolis, Trask Engrg. 612-537-2434
MO Manchester, Control Sys. Des. 314-227-4212
NJ Emerson, Techtrol, Inc. 201-967-7640
NY Cazanovia, D & O Engrg. Co. 315-655-8602
NY Rochester, D & O Engrg. Co. 716-247-6838
NY Youngston, D & O Engrg. Co. 716-754-7650
NC Cary, Sesco-Raleigh 404-458-6423
OH Cleveland, Marlowe Assocs., Inc. 216-991-6500
OH Dayton, Marlow & Assocs. 513-274-9666
OK Tulsa, Sesco-Tulsa 512-892-2490
OR Portland, Fry Controls, Inc. 503-244-3313
PA Frazer, FLW of PA, Inc. 215-251-9700
PA Pittsburgh, Marlow & Assocs. 412-367-8886
TX Austin, Sesco-Austin 512-892-2490
TX Dallas, Sesco-Dallas 512-892-2490
TX Houston, Sesco-Houston 512-892-2490
TX Plano, Sesco-Military Sls. 512-892-2490
UT Murray, Instr. Specialists, Inc. 801-261-0142
VA Richmond, Dynamation 804-794-7667
WA Federal Way, Fry Controls, Inc. 206-282-9270

Local Distributors

CA Los Angeles, EIL Instrs. Inc. 213-685-7020
CA Sunnyvale, EIL Instrs. Inc. 408-245-4320
CO Denver, EIL Instrs. Inc. 303-534-4160
CT Middletown, EIL Instrs. Inc. 203-346-6646
FL Palm Bay, EIL Instrs. Inc. 407-725-8300
IL Bridgeview, EIL Instrs. Inc. 312-430-2292
IN Indianapolis, EIL Instrs. Inc. 317-545-1373
KY Louisville, EIL Instrs. Inc. 502-454-3420
MD Sparks, EIL Instrs. Inc. 301-771-4800
MA Burlington, EIL Instrs. Inc. 617-272-9450
NJ Pennsauken, EIL Instrs. Inc. 609-488-0474
NY Clarence, EIL Instrs. Inc. 716- 634-8500
NY Hauppauge, EIL Instrs. Inc. 516-231-6333
NY Pittsford, EIL Instrs. Inc. 716-586-8251
NC Charlotte, EIL Instrs. Inc. 704-376-2237
OH Cleveland, Pioneer-Standard Elctrns. 800-262-3600,800-362-9127
OH Dayton, EIL Instrs. Inc. 513-435-2134
PA Pittsburgh, EIL. Instrs.Inc. 412-823-2255
TX Dallas, EIL Instrs. Inc. 214--357-0297
TX Houston, EIL Instrs.Inc. 713-271-3100
VA Norfolk, EIL Instrs. Inc. 804-855-9553
VA Springfield, EIL Instrs. Inc. 703-569-2611
WA Redmond, EIL Instrs. Inc. 206-882-3222
Can Calgary, Alberta, EIL Instrs. Inc. 403-271-2001
Can Longueil, Que., EIL Instrs. Inc. 514-651-4844
Can Mississauga, Ont., EIL Instrs. Inc. 416-624-6660

D. L. CUSTOM, 7250 Victoria Park Ave., Markham, Ont, Canada L3R 2M5, Tel: 416-475-0275; *Sls. Mgr.:* Les Hull, Jr. ..... **C•1021**

D. O. INDUSTRIES, 200 Commerce Dr., Rochester, NY 14623, Tel: 716-359-4000, TELEX: 200802, FAX: 716-359-4999; *Sls. Mgr.:* Jeremy Goldstein

DOLAN-JENNER INDS., Box 1020, Woburn, MA 01801, Tel: 617-935-7444, TELEX: 94-8161, FAX: 617-938-7219; Empl.: 120; *Sls. Mgr.:* S. Futran; *Dist. Mgr.:* S. Futran

DOLPH, JOHN C., CO., New Rd., Monmouth Junction, NJ 08852, Tel: 201-329-2333, FAX: 201-329-1143; *Sls. Mgr.:* J. E. Rooze

DONTECH, INC., 700 Airport Blvd., Doylestown, PA 18901, Tel: 215-348-5010, TELEX: 685 1155 DONTK, FAX: 215-348-9959; FSC No.: 63009; *Sls. Mgr.:* Jordan C. Miller, Sls. Mgr.

DORAN

DORAN MANUFACTURING CO., 2834 Sidney Ave., Cincinnati, OH 45225, Tel: 513-681-5424; Empl.: 40; *Sls. Mgr.:* Jeff Stegman

DORMEYER INDS., A. F. Dormeyer Mfg. Co., Inc., 3418 N. Milwaukee, Chicago, IL 60641, Tel: 312-283-4000, FAX: 312-283-4927; Empl.: 400; *Sls. Mgr.:* Richard Henry, Dir. Sls. & Engrg.

DOTRONIX, 160 First St. SE, New Brighton, MN 55112, Tel: 612-633-1742, TWX: 910-563-3541, FAX: 612-633-7025; Empl.: 570; *Sls. Mgr.:* Len Stewart, Natl. Sls. Mgr.

DOUGLAS ELECTRONICS, 718 Marina Blvd., San Leandro, CA 94577, Tel: 415-483-8770, FAX: 415-483-6453; Empl.: 30

DOUGLAS RANDALL, 6 Pawcatuck Ave., Pawcatuck, CT 06379, Tel: 203-599-2075, FAX: 203-599-1754; Empl.: 125; *Sls. Mgr.:* D. Aves ..... **B•1464-1468**

Local Sales Offices & Reps

AZ	Tempe, Trembly Assoc.	602-967-2058
CA	Norwalk, Deltec Co.	818-340-2025
CA	Oakland, Powermatic Assoc.	415-635-6825
CO	Wheat Ridge, Trembly Assoc.	303-421-8900
CT	Yalesville, JMG-Glynn Connecticut	203-265-9452/2498
FL	Oldsmar, Boggs & Assocs.	813-855-1812
IL	Chicago, Ropek-Cahill-Vogt	312-806-0066
IN	Carmel, Berndt Assocs., Inc.	317-844-0114
MA	Norwood, JMG, Inc.	617-762-5333
MN	Osseo, Gaffney Sls. Co.	612-425-5484
MO	Kansas City, Delltron Co., Inc.	816-436-6445
MO	St. Louis, Delltron Co.	314-869-4779
NV	Las Vegas, Trembly Assoc.	702-739-9770
NJ	Morristown, Andrews & Andrews	201-569-8800
NM	Albuquerque, Trembly Assoc.	505-266-8616
NY	Glen Head, Andrews & Andrews	516-692-8686
NY	Roochester, J. G. Welch Assoc.	716-244-1100
NY	Syracuse, Mullahy/Welch	315-685-6280
NC	Raleigh, Micro Sls.	919-872-7922
OH	Cleveland, Geotronix Mktg. Assoc.	216-659-6100
OH	Trotwood, Geotronix, Inc.	513-252-6700
PA	Newtown, Total Control	215-860-5333
TX	Dallas, Paramount Controls	214-341-4561
Can	Mont., Que., Solid State Engrg. Co.	514-481-3313

Local Distributors

CA	Chatsworth, Mill-Comm Dist.	213-998-3111
CA	Norwalk, Nycro Elec.	818-340-2025
CA	S. San Francisco, Steven Engrg.	415-588-9200
FL	Hollywood, MRO Elctrn. Distrs.	305-966-4847
MA	Middleboro, Glynn Elec.	508-947-4262
OH	Cleveland, Alpha Corp.	216-659-7100
PA	Narberth, Power Modules	215-668-0664
PA	Yeadon, Y-L Prods.	215-583-2800
TX	Houston, Butler & Land	713-896-0808

DOVA CONTROLS, 4052 148th Ave. N.E., Redmond, WA 98052, Tel: 206-881-7414, ESYLNK: 62027625, FAX: 206-881-2569; Empl.: 6; *Sls. Mgr.:* Lynn Myers

DOVER ELECTRONICS MANUFACTURING, Kirkwood Industrial Park, P.O. Box 5212, Binghamton, NY 13902-5212, Tel: 607-772-7563, 1-800-PWB-ASSY, TWX: 510-252-1990, FAX: 607-772-9274; Empl.: 371; *Sls. Mgr.:* Robert P. Egan ..... **D•2239**

Local Sales Offices & Reps

NY	Binghamton, Dover Elctrns. Mfg.	607-772-7563

DOW CORNING CORP., Box 0994, Midland, MI 48686-0994, Tel: 517-496-4000, TELEX: 227450, TWX: 810-266-9006; Empl.: 7,000

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DOW-KEY MICROWAVE CORPORATION, 1667 Walter St., Ventura, CA 93003, Tel: 805-650-0260, TWX: 910-380-4327; FSC No.: 00471; Empl.: 60; *Sls. Mgr.:* Julie Williams & John A. Wieklinski; *Dist. Mgr.:* Jack Dysart ..... **B•1721**

Local Sales Offices & Reps

AL	Huntsville, Southern Mktg. Assocs.	205-534-6020
AZ	Tempe, Sierra Tech. Grp.	602-894-2335
CA	Mission Hills, Detomasi & Grupp Inc.	818-365-8285
CA	Mountain View, Peninsula Tech. Sls.	415-965-3636
CA	San Diego, Detomasi & Grupp Inc.	619-277-0178
CA	Torrance, Detomasi & Grupp, Inc.	213-618-8898
CO	Englewood, Sierra Tech. Grp., Inc.	303-790-1700
FL	Longwood, Southern Mktg. Assocs.	407-682-7317
GA	Marietta, Southern Mktg. Assocs.	404-565-0603
IL	Elgin, Gassner & Clark inc.	312-695-9540
IA	Cedar Rapids, H. R. Brown Sls. Co.	319-366-0635
KS	Lenexa, Dytec/South, inc.	913-888-0215
KS	Wichita, Dytec/South, Inc.	316-945-7090
MD	Beltsville, Applied Engrg. Consits.	301-595-5393
MA	Chelmsford, Matrix Sls. Inc.	508-459-4000
MA	Lowell, Matrix Sls., Inc.	508-459-4000
MN	Bloomington, Bill Deming & Assocs.	612-888-5000
MO	Maryland Hgts., Dytec/South, Inc.	314-739-0665
NY	Hartsdale, Spectrum Sls. Inc.	914-472-8600
NY	Rochester, Lamb Comps., Inc.	716-272-7720
NC	Greensboro, Southern Mktg. Sls.	919-854-5588
OH	Dayton, Delta Sls.	513-435-9735
OH	Miamisburg, Elctrns. Comps.	513-866-3340
PA	Ambler, W. M. Assocs. Inc.	215-643-4119
TX	Houston, Lear Assocs., Inc.	713-488-7893
TX	Richardson, Lear Assocs., Inc.	214-231-5388
Can	Nepean, Ont., Dynasty Comps.	613-723-0725

DOW SWITCH, 271 Ballardvale St., P.O. Box 1332, Wilmington, MA 01887, Tel: 617-935-6395, FAX: 617-658-2307; Empl.: 22; *Sls. Mgr.:* Toni Stevens

DOWTY INTERCONNECT, Dowty Electronic Components LTD, Knaves Beech Business Centre, Loudwater, High Wycombe, Bucks, ENGLAND HP10 9UT, Tel: 0-628-810810, TELEX: 846874 DEI UKG, FAX: 0-628-810813

DOWTY RFL INDS. INC./COMMUNICATIONS DIV., The Dowty Grp. PLC, Powerville Rd., Boonton, NJ 07005-0239, Tel: 201-334-3100, TELEX: 215071 (ANS BK: DRFL UR); FSC No.: 49673; Empl.: 300

DOWTY RFL INDS. INC./INSTRUMENTATION DIV., The Dowty Grp. PLC, Powerville Rd., Boonton, NJ 07005-0239, Tel: 201-334-3100, TELEX: 215071 (ANS BK: DRFL UR), FAX: 201-334-3863; FSC No.: 49673; Empl.: 300

DOWTY ELECTRONICS CO., Thermocontrol Div., Prospect St., P.O. Box 250, Brandon, VT 05733, Tel: 802-247-6811, TWX: 710-987-8352, FAX: 802-247-3946; Empl.: 150; *Sls. Mgr.:* Dan Boutin; *Dist. Mgr.:* Dan Boutin

DRACON DIV., See Harris Corp., Dracon Div.

DRANETZ TECHNOLOGIES, INC., 1000 New Durham Rd., P.O. Box 4019, Edison, NJ 08818-4019, Tel: 201-287-3680, TELEX: 499-7808, TWX: 710-997-9553, FAX: 201-287-8627; FSC No.: 23207; Empl.: 230; *Sls. Mgr.:* Ed Mc Donald

DREEFS SWITCH, INC., 3782 Hawthorn Ct., Waukegan, IL 60087, Tel: 312-662-7667, 800-323-9605, TELEX: 703784 MTL DREEFS UD, FAX: 312-662-0906; Empl.: 63; *Sls. Mgr.:* Ed Magiera; *Dist. Mgr.:* Ed Magiera ..... **B•1722**

Local Sales Offices & Reps

AL	Huntsville, Hollingsworth & Still	800-241-5712
CA	Anaheim, Spectrum Assocs., Inc.	714-630-6977
CA	Los Altos, Nickerson-Gray & Assocs.	415-941-5777
CA	Poway, Spectrum Assocs.	619-487-5691
CO	Denver, Donohue Sls. Co.	303-455-1719
CT	Madison, Reptron Sls.	203-245-2242
FL	Ft. Lauderdale/Tampa, Hollingsworth & Still	800-241-5712
GA	Norcross, Hollingsworth & Still	404-447-1700
IL	Waukegan, DSI	312-662-7667
MS	Jackson, Hollingsworth & Still	800-241-5712
MO	Florissant, Delltron Co., Inc.	314-839-0033
MO	Kansas City, Delltron Co.	816-436-6445
NJ	Ocean, P. Saftler Assocs.,Inc./Gordon	201-922-3014
NY	Fulton, P. Saftler Assocs.	315-592-7184
NY	Lynbrook, P. Saftler Assocs.	516-593-7880
NC	Charlotte, Hollingsworth & Still	800-241-5712
OH	Cleveland, Allied Entprs.	216-779-0080
PA	Malvern, Stitzer Assocs.	215-644-5500
PA	Murrysville, Allied Entprs.	412-325-3200
SC	Columbia, Hollingsworth & Still	800-241-5712
TN	Cleveland, Hollingsworth & Still	800-241-5712
TX	Dallas, Blackburn Assocs.	214-750-8484
WI	Mequon, Badgerep, Inc.	414-241-9200
EXP	Waukegan,IL, Dreefs Switch, Inc.	312-662-7667
Can	Concord, Astec Comps.	416-669-4022

Local Distributors

CA	Sunnyvale, Power Supp. Comps.	408-737-1333
CO	Denver, C.S.I.D.	303-292-9594
IL	Wheeling, Hawk Elctrns.	213-459-4030, 800-843-4295
EXP	Waukegan, IL, Dreefs Switch Inc.	312-662-7667

DSA, INC.(DAI-ICHI SHOJI OF AMERICA), Div. of Leader Instruments, 150 Fifth Ave., Suite 845, New York, NY 10011, Tel: 212-691-9050, FAX: 212-807-1598; Empl.: 3; *Sls. Mgr.:* A. Takayama ..... **B•1723; C•1330**

Local Sales Offices & Reps

NY	New York, Dai-Ichi Shoji of America, Inc.	212-691-9050

DSP TECHNOLOGY, 48500 Kato Rd., Fremont, CA 94538, Tel: 415-657-7555, TELEX: 263608, FAX: 415-657-7576; Empl.: 60; *Sls. Mgr.:* Robert LeBrun

DUBBELDEE HARRIS DIAMOND CORP.:D. DRUKKER & ZN. N.V., 100 Stierli Ct., Mt. Arlington, NJ 07856, Tel: 201-770-1420, TELEX: RCA 236064, FAX: 201-770-1549; *Sls. Mgr.:* Keith Harris

DUKANE CORP., Communications Sys. Div., 2900 Dukane Dr., St. Charles, IL 60174-9984, Tel: 312-584-2300, TELEX: 720426, FAX: 312-584-2370; Empl.: 650; *Sls. Mgr.:* Warren Anderson; *Dist. Mgr.:* Warren Anderson

DUMONT/E & R ELECTRONICS, INC., 40 Fairfield Pl., W. Caldwell, NJ 07006, Tel: 201-575-8666, TELEX: 219236 DOLI-UR; FSC No.: 30669; Empl.: 30; *Sls. Mgr.:* Edward Petrasek

DUNCAN ELECTRONICS, INC., 2865 Fairview Rd., Costa Mesa, CA 92626, Tel: 714-545-8261, TWX: 910-595-1128, FAX: 714-557-6240; FSC No.: 5905;Multiple; Empl.: 110; *Sls. Mgr.:* J. Colligan; *Dist. Mgr.:* S. Anderson ..... **A•2106-2107**

Local Sales Offices & Reps

AL	Huntsville, L. & D., Inc.	205-837-1469
AZ	Tempe, Southwest E/M Engrg.	602-941-2828
AR	El Dorado, Kemp Engrg. Co., Inc.	501-862-5869
CA	Costa Mesa, Comar Co.	714-250-0140
CA	Santa Clara, Caltron Comps.	408-980-0181
CO	Denver, Elcom	303-337-2300
CT	Cheshire, The MacInnis Co.	203-272-3797
FL	Deerfield Bch., ElectroComp Assocs.	305-429-0802
FL	Palm Harbor, ElectroComp Assocs.	813-787-6669
GA	Atlanta, L. & D., Inc.	404-395-7079
IL	Arlington Hgts., KMA Sales Co.	312-398-5300
IN	Indianapolis, Mktg. Engrs., Inc.	317-872-5665
KS	Shawnee Mission, Florence & Meyer	913-722-5210
LA	Lafayette, Kemp Engrg. Co.	318-269-9452
MA	Norwood, The MacInnis Co.	617-762-8090
MI	Farmington Hills, Elcon Michigan Sls.	313-855-3240
MN	New Brighton, J. J. Exon Co.	612-636-5533
NY	Clinton, Advanced Comps.	315-853-6438
NY	Copiague, Sencor	516-789-8557
NY	Endicott, Advanced Comps.	607-785-3191
NY	N. Syracuse, Advanced Comps.	315-699-2671
NY	Scottsville, Advanced Comps.	716-889-1429
NC	Greensboro, L. & D., Inc.	919-292-3201
NC	Raleigh, L. & D., Inc.	919-876-5301
OH	Dayton, Dolfuss-Root & Co.	513-433-6776

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OH	Worthington, Dolfuss-Root & Co.	614-846-1377
OK	Tulsa, Kemp Engrg. Co.	918-663-4501
WA	Vancouver, Elctrn. Mktg. Grp.	503-684-5935
PA	Birchrunville, Jadelectronic Assocs., Inc.	215-296-3800
PA	Bridgeville, Dolfuss-Root & Co.	412-221-4420
PA	Philadelphia, Jadelectronic Assocs., Inc.	215-455-0664
TX	Addison, Kemp Engrg. Co.	214-931-7100
TX	Austin, Kemp Engrg. Co., Inc.	512-263-3322
TX	Houston, Kemp Engrg. Co.	713-466-1465
UT	Salt Lake City, Elcom	801-486-4233
VA	Richmond, L & D, Inc.	804-257-7717
WA	Liberty Lake, Elctrn. Mktg. Grp.	509-922-2718
WA	Redmond, Elctrn. Mktg. Grp.	206-882-0962
WI	Milwaukee, KMA Sales Co.	414-259-1771

DUPLICON, INC., 516 E. Second St., S. Boston, MA 02127, Tel: 617-269-5484; FSC No.: 0ASD8; Empl.: 6; *Sls. Mgr.:* William A. Currier

DUPONT DE NEMOURS, E. I., & CO., 1007 Market St., Wilmington, DE 19898, Tel: 302-773-3218; Empl.: 130,000

DUPONT

FAX: 302-992-4442

DUPONT ELECTRONICS, Barley Mill Plaza, P.O. Box 80013, Wilmington, DE 19880-0013, Tel: 800-237-4357; *Sls. Mgr.:* E. N. Tolson; *Dist. Mgr.:* J. M. Kendrick ..... **C•1331-1342**

Local Sales Offices & Reps

CA	Santa Clara	408-562-9300,800-237-4357
MA	Burlington	617-273-6000,800-237-4357
NC	Resch. Triangle Pk.	919-248-5000,800-237-4357

DUPREE, INC., 14395 Romona Ave., Chino, CA 91710, Tel: 714-597-4889, TWX: 510-100-0281; Empl.: 65; *Sls. Mgr.:* S. Broussard; *Dist. Mgr.:* S. Broussard

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DURACELL INC.:OEM SLS. & MKTG., Berkshire Industrial Park, Bethel, CT 06801, Tel: 203-791-3274, TELEX: 6972165; Empl.: 4000; *Sls. Mgr.:* R. D'Alessandro ..... **D•1479-1482**

Local Sales Offices & Reps

CA	Irvine, Duracell Inc.	714-476-1811
CT	Southbury, Duracell	203-264-3935
IL	Oak Brook, Duracell Inc.	312-954-2714

Local Distributors

CA	Mtn. View, Energy Sls. Inc.	415-969-0800
CA	San Diego, Tauber Elctrns. Inc.	619-274-7242
GA	Norcross, Applied Power Inc.	404-263-0421
IL	Downers Grove, TDI	312-971-3460
MA	Sharon, Adcour	617-784-8123
MI	Brighton, Applied Power Inc.	313-227-3604
MN	St. Paul, dc Battery Prods.	612-646-7478
MO	Maryland Hgts., LComp	314-291-6200
NJ	Clifton, Engrd. Assemblies Corp.	1-800-BATTERY
NY	Commack, Bren-Tronices Inc.	516-499-5155
NC	Winston-Salem, Progressive Technlgs., Inc.	919-761-1375
TX	Houston, K-Tec Inc.	713-780-7770
WA	Redmond, Energy Sls. Inc.	206-883-2343

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Local Sales Offices & Reps

AZ	Mesa, H-D Assocs., Inc.	602-437-0064
CA	Burlingame, Campbell & George	415-697-2965
CA	Canoga Parkk, C & W Comp. Sls.	818-700-2684
CA	Sunnyvale, Pass Assocs.	408-735-9040
CO	Englewood, Harthun Assocs.	303-792-5050
FL	Clearwater, J. J. Galleher Co.	813-461-7706
GA	Smyrna, Tech Controls, Inc.	404-333-9883
IN	Mishawaka, Power Comps. of Midwest	219-256-6630
IA	Davenport, Volco Co.	319-326-5233
KS	Overland Park, R. Greene Co.	913-492-6886
LA	Baton Rouge, L. Elliott Co.	504-272-2877
MA	Hingham, Hingham Bay Corp.	617-740-1900
MI	Novi, Advanced Controls & Technlg.	313-349-0260
MN	Minneapolis, Volco Co.	612-933-6631
MS	Corinth, World Dists.	205-533-9108
MO	St. Louis, R. Greene Co.	314-994-0222
NE	Omaha, Volco Co.	402-346-2203
NY	Buffalo, Niagara Elec. Sls. Co.	716-825-3100
NY	Wantagh, DONY Tech. Sls.	516-826-5550
NC	Pineville, Mel Sls.	704-541-5750
OH	Parma, Orr Assocs.	216-885-1324
OK	Tulsa, L. Elliott Co.	918-663-4616
OR	Portland, Branom Instr. Co.	503-283-2555
PA	Narberth, Power Modules Inc.	215-668-0664
TX	Addison, L. Elliott Co.	214-239-8533
TX	Midland, Lynn Elliott Co.	915-684-8414
TX	Missouri City, L. Elliott Co.	713-499-1571
UT	Salt Lake City, Western Controls	801-266-1500
WA	Bothell, Temco N.W.	206-821-5434

Local Distributors

IN	Mishawaka, Power Comps. of Midwest	219-256-6630
PA	Narberth, Power Modules	215-839-1331

DUREL CORPORATION, Affiliate of 3M & Rogers Corp., 645 W. 24th St., Tempe, AZ 85282, Tel: 602-731-6200, FAX: 602-731-6210

DURGIN & BROWNE, See Tridyne Process Systems, DBI Inds.

DY-4 SYSTEMS INC., 21 Credit Union Way, Nepean, Ont., Canada K2H 9J4, Tel: 613-596-9911, TELEX: 0534111, FAX: 613-596-0574; Empl.: 280; *Sls. Mgr.:* Mitch Robinson

DYLON GRAPHITE CO., 124 First Avenue, Berea, OH 44017, Tel: 216-234-1600, FAX: 216-234-6392; Empl.: 35; *Sls. Mgr.:* K. A. Partee

DYMEC

FAX: 617-729-1639

DYMEC SILICON TRANSISTOR CORP., 8 Lowell Ave., Winchester, MA 01890, Tel: 617-729-7870, TWX: 710-348-6596; Empl.: 50; *Sls. Mgr.:* J. Dennis Santucci ..... **B•1206-1207; D•1177**

Local Sales Offices & Reps

AZ	Phoenix, Southwest Tech. Sls.	602-893-1209
CA	San Diego, California Elctrn. Mktg., Inc.	619-265-8331
CA	San Ramon, Technical Consultants	415-830-0829
CA	Santa Ana, California Elctrn. Mktg., Inc.	714-835-2702
GA	Duluth, Dixie Tech. Mktg.	404-381-5592
MD	Linthicum Heights, KD Assocs.	301-859-5151
MA	Winchester, Factory	617-729-7870
MO	St. Louis, Ozark Elctrn. Mktg., Inc.	314-423-7200
NM	Albuquerque, Reptronix, Ltd.	505-292-1718
NY	New Rochelle, Repco Assocs., Inc.	914-235-6405
NY	Syracuse, Labtronics, Inc.	315-455-7314
OH	Chagrin Falls, Hester Assocs., Inc.	216-338-5102
PA	Sellersville, Tech-Com Mktg., Inc.	215-723-0820
TX	Dallas, Kay Todd Assocs.	214-458-8837
WA	Everett, Cunningham Sls., Inc.	206-348-4800

DYNACAST, Div. Coats & Clark Inc., 1401 Front Street, Yorktown Heights, NY 10598, Tel: 914-245-0060, TELEX: 6716096; Empl.: 150

DYNACIRCUITS INC., 11230 W. Addison, Franklin Park, IL 60131, Tel: 312-451-1700; FSC No.: ;;;312-451-9266; Empl.: 300; *Sls. Mgr.:* Dennis Dworzak(Western U.S.), Carl Morahan(Eastern U.S.)

DYNAGE/CONTROLS, INC., P.O. Box 95, 551 Third Avenue, Canistota, SD 57012, Tel: 605-296-3487, TELEX: 753243 (OAKLEAFINC), FAX: 605-296-3231; Empl.: 12; *Sls. Mgr.:* Sidney C. Oakleaf

DYNAGE/POWER & MAGNETICS, Division Of Oakleaf, Inc., P.O. Box 95, 551 Third Avenue, Canistota, SD 57012, Tel: 605-296-3462/3487, TELEX: 753243 (OAKLEAFINC), FAX: 605-296-3231; FSC No.: 9Y852; Empl.: 20; *Sls. Mgr.:* Sidney C. Oakleaf ... **A•2278-2279; D•1724-1726**

DYNALOY, INC., 7 Great Meadow La., Hanover, NJ 07936, Tel: 201-887-9270, TELEX: 642-033, FAX: 201-887-3678; FSC No.: 27908; Empl.: 19; *Sls. Mgr.:* Jay Parton

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DYNAMICS RESEARCH CORP., Encoder Division, 60 Concord St., Wilmington, MA 01887-2193, Tel: 508-658-6100, FAX: 508-658-0522; Empl.: 125; *Sls. Mgr.:* Joe Portada

DYNAPAR, 1675 Delany Rd., Gurnee, IL 60031, Tel: 312-662-2666, TWX: 910-235-1865; Empl.: 150

DYNAPOWER CORPORATION

FAX: 313-553-9096

DYNAPOWER CORPORATION, Box 3180, Farmington Hills, MI 48333, Tel: 313-553-4300, TWX: 810-242-8804; Empl.: 75 ..... **D•1729-1732**

DYNATECH COMPUTER COMPANY, 280 Bernardo Ave., P.O. Box 7400, Mountain View, CA 94039-7400, Tel: 415-964-7400, TWX: 910-379-6988, FAX: 415-969-3350; Empl.: 49; *Sls. Mgr.:* Howard Klemmer; *Dist. Mgr.:* Karen Vorster

DYNATECH COMPUTER POWER, INC., 5800 Butler Ln., Scotts Valley, CA 95066, Tel: 408-438-5760, TELEX: 887-247, FAX: 408-438-5793; FSC No.: 7045

DYNATEM, 19 Thomas St., Irvine, CA 92718, Tel: 714-855-3235, TWX: 910-595-2603, FAX: 714-770-3481; Empl.: 20; *Sls. Mgr.:* Mike Horan; *Dist. Mgr.:* Linda Boate

DYNISCO, 10 Oceana Way, Norwood, MA 02062, Tel: 617-769-6600, TELEX: 174-292; FSC No.: 15687; Empl.: 153; *Sls. Mgr.:* Warden B. Hunt

DYTRONICS CO., See Ryan Intl. Corp.

DZUS FASTENER, 425 Union Blvd., W. Islip, NY 11795, Tel: 516-669-6000, TELEX: 71-4974043, FAX: 516-669-0785; FSC No.: 72794; Empl.: 140; *Sls. Mgr.:* Victor Cappetta

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MA	Concord, Nortech Engr. Sls.	508-369-8605
MN	Eden Prairie, Electro Mark, Inc.	612-944-5850
NY	Commack, R.C. Engrg.	516-543-3325
PA	Glenside, Koebert Assocs.	215-576-1329
TX	Irving, Space Elctrns.	214-251-3636

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ELECTRONICS DIVISION

FAX: 417-776-2257

EAGLE-PICHER, Box 47, Joplin, MO 64801, Tel: 417-623-8000, TWX: 910-774-4506; Empl.: 700 ... **D•1486-1488**

EAGLE-PICHER, P.O. Box 130, Bethel Road, Seneca, MO 64865, Tel: 417-776-2256, TWX: 910-774-4533; FSC No.: 3L498; Empl.: 400; *Sls. Mgr.:* H. M. York; *Dist. Mgr.:* H. M. York ..... **D•1483-1485**

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AL Huntsville, L & D Inc. 205-837-1469
AZ Scottsdale, S.W. Sls. 602-391-3180
AR Hot Springs, Automation Supp. Inc. (ASI) 501-767-5444
CA San Jose, O'Donnell Assocs.-North ... 408-263-6500
CA Torrance, O'Donnell Assoc. 213-539-9664
CT Bloomfield, Zaslow Sls. Co. 203-242-7781
FL Longwood, NSL Assocs., Inc. 305-629-5226
GA Atlanta, L & D Inc. 404-395-7079
ID Elk Grove Vl., Parcom, Inc. 312-228-6360
IA Des Moines, SPS Assocs., Ltd. 515-225-0607
KS Olathe, SPS Assocs., Ltd. 913-764-4460
MA Westboro, Zaslow Sls. Co. 617-393-8150
MN Minneapolis, Ohlin Sls. Co. 612-929-6924
MO Earth City, SPS Assocs., Ltd. 314-291-0520
NE Panama, SPS Assocs., Ltd. 402-788-2536
NH Londonderry, Zaslow Sls. Co. 603-432-8907
NM Albuquerque, WJM Sls. 505-268-9499
NY Massapequa Pk., HC Assocs. 516-541-0262
NY Morrisville, Naylor Elec. Co. 315-684-9620
NC Raleigh, L & D Inc. 919-876-5301
OH Dayton, Lyons Corp. 513-278-0714
OR Beaverton, Pacific Mktg. Spec. 503-641-9373
PA Exton, Kiley Elec. Co. 215-363-8550
TX Dallas, Rem Air Comps. 214-234-1069
VA Richmond, L & D Inc. 804-359-0125
WA Redmond, Pacific Mktg. Spec. 206-882-3144

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AZ Tempe, Lynntronics 602-433-0288
AR Hot Springs, Automation Supp. Inc. ... 501-767-5444
CA Anaheim, Carefree Unltd. 714-630-3433
CA Palo Alto, The Power Source, Inc. 415-856-0700
CO Denver, J & B Sls. 303-698-2211
FL Duneoin, Battery Powered Lighting & Sys. 813-734-9498
GA Austell, DC Power Prods. 404-948-2593
GA Smyrna, Mark C. Pope Assocs. 404-435-2471
IL Arlington Hgts., Lodan Elctrns. 312-398-5311
KS Wichita, RSC Elctrns. 316-267-5213
LA Shreveport, Indl. Elctrn. Supp. Inc. 318-222-9459
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NY Amityville, Battery Power of LI. 516-691-1993
NY Brewster, WHI Batteries 914-278-6151
OH Columbus, Promark Elctrns., Inc. 614-876-8885
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PA Bensalem, Scotts Emergency Lighting 215-639-1777
TX Stafford, Southwest Elctrns. 713-240-4000
Can Mississauga, Ont., Battery Tech. 416-670-7373

EAGLE SIGNAL CONTROLS:A MARK IV INDS. CO., 8004 Cameron Rd., Austin, TX 78753, Tel: 512-837-8300, TELEX: 166975, FAX: 512-837-8486; Empl.: 3000; *Sls. Mgr.:* Donald Morse

EALING ELECTRO-OPTICS, New Englander Industrial Park, Holliston, MA 01746, Tel: 617-429-8370, 1-800-343-4912, TELEX: 240041, FAX: 617-875-5616; *Sls. Mgr.:* James F. Babb

E & L INSTRUMENTS, Interplex Electronics, Inc., 70 Fulton Terrace, New Haven, CT 06512, Tel: 203-624-3103, FAX: 203-468-0060; Empl.: 70; *Sls. Mgr.:* Dan Marley

EAO SWITCH CORP., 198 Pepe's Farm Rd, P.O. Box 552 MO, Milford, CT 06460, Tel: 203-877-4577, TELEX: 96-4347, FAX: 203-877-3694; FSC No.: 61706; Empl.: 19; *Sls. Mgr.:* George T. Bracci ..... **B•1732**

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CA Montrose, Luscombe Engrg. Co. of L.A. 818-249-9000
CA San Diego, Luscombe Engrg. Co. of S.D. 619-292-4323
CO Longmont, Luscombe Engrg. Co. of CO 303-772-3342
CT Bethel, Ray Perron & Co. 203-798-0261
CT Farmington, Ray Perron & Co., Inc. 203-673-4825
FL Deerfield Beach, Florida Comp. Sls. ... 305-429-1758
FL Tampa, Florida Comp. sls. 813-960-7044
GA Norcross, Mtn. Electro Mktg. 404-448-5594
IL Arlington Hgts., Brainard-Wilson Mktg., Inc. 312-437-2700
IN Ft. Wayne, M/S Sls. & Assocs. 219-436-3023
IN Greenwood, M/S Sls. & Assocs. 317-881-0110
IA Cedar Rapids, Delltron Co., Inc. 319-393-0075
MD Columbia, Delta III Assocs., Inc. 301-730-4700
MA Needham, Ray Perron & Co., Inc. 800-225-4280, 617-449-6162
MI Plymouth, Jay Mktg. Assocs., Inc. 313-459-1200
MN Golden Valley, Highland Elctrn. Sls. ... 612-546-2123
MO Florissant, Delltron Co., Inc. 314-839-0033
MO Gladstone, Delltron Co., Inc. 816-436-6445
NH Merrimack, Ray Perron & Co., Inc. 603-424-4423
NJ Englewood, Sprung/Nussbaum 201-569-5666
NY Hauppauge, Sager Elec. Supp. Co. 516-348-1300
NY Rochester, Apex Assocs., Inc. 716-272-7040
NC Raleigh, C-Tech Sls., Inc. 919-782-8100
OR Lake Oswego, Luscombe Engrg. Northwest 503-636-6664
PA Horsham, Jacobsen Assocs. 215-674-2937
PA Pittsburgh, R. W. Kneip 412-823-0169
TX Dallas, Glidden Electro Equip. Co 214-341-0610
TX Houston, Glidden Electro Equip. Co. .. 713-681-1415
UT Midvale, Luscombe Engrg. Co. 801-565-9885
WA Bellevue, Luscombe Engrg. N.W. 206-223-1541
WI Mequon, Badgerep 414-241-9200

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AZ Phoenix, Minarik Elec. 602-233-3000
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CA Compton, Harper SID 213-979-5090
CA Gardena, California Switch & Sig. 213-770-2330
CA Glendale, Minarik Elec. Co. 818-507-6500
CA Hayward, KEA Elctrns. 415-887-2900
CA S. San Francisco, Bell Elctrl. Supp. 415-589-7055
CA Salinas, Bell Elctrl. Supp. 408-758-6110
CA San Diego, Harper SID 619-578-2500
CA San Diego, Minarik Elec. Co. 619-560-6632
CA San Jose, Harper SID 408-943-9490
CA Santa Clara, Bell Elctrl. Supp. 408-727-2355
CA Santa Clara, Minarik Elec. Co. 408-727-0575
CA Torrance, Kent Elctrns. 213-320-2700
CO Denver, CSID, Inc. 303-292-9594
CO Denver, Minarik Elec. Co. 303-329-3525
CT Wallingford, Midan Elctrns. 203-265-2077
CT Wallingford, Sager Elec. Supp. co. 203-265-4600
FL Lakeland, Wes-Garde/Switch Controls, Inc. 813-644-7564
FL Oviedo, Dixie Sls. 407-365-5211
IL Algonquin, Marshall Wolf Automation 312-658-8130
IL Crystal Lake, Sub-Sem, Inc. 312-782-3954
IL Elk Grove, Martec Assoc. 312-956-8090
IL Rosemont, Advent Elctrns., Inc. 312-297-6200
IL Schaumburg, Minarik Elec. Co. 312-885-9337
IN Indianapolis, Mar Elctrns. 317-633-6699
IN Indianapolis, R.M. Indiana 317-291-7110
IA Cedar Rapids, Advent Elctrns., Inc. 319-363-0221
KS Wichita, Radio, Inc. 316-264-2798
KY Louisville, Peerless Elctrns. 502-637-7674
LA Baton Rouge, Menard Elctrns. 504-355-0323
ME W. Buxton, Nelson & Wright 207-929-8238
MD Gaithersburg, Axis Elctrns. 301-840-9640, 800-492-3190
MD Jessup, Treeko Sls. 301-792-0112
MA Canton, Impact Sls. Co. 617-821-1500
MA Hingham, Sager Elec. Supp. Co. 617-749-6700
MA N. Billerica, Minarik Elec. Co. 508-663-0740
MI Grand Rapids, R. M. Elctrns. Co. 616-531-9300
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MN Minneapolis, Electronic Ctr., Inc. 612-378-2442
MO St. Louis, Beckwith, Inc. 314-343-6463
NH Salem, Sager Elec. Supp. Co. 603-898-1348
NJ Cranford, Garden State Indl. Elctrns., Inc. 201-272-6400
NY Bohemia, Key Comps., Inc. 516-567-7500
NY Buffalo, Summit Distrs., Inc. 716-887-2800
NY New York, Martin-Audio/Video 212-541-5900
NY Rochester, Simcona Elctrns. 716-328-3230
NY Rochester, Summit Elctrns., Inc. 716-334-8110
NY Victor, ADD/Modutex 716-924-4400
NY Woodside, Switches Unlimited 718-478-5000
NC Charlotte, Dixie Elctrns. 704-377-4348
NC Charlotte, Elctrns. Mktg. Corp. 704-394-6195
NC Winston-Salem, Kirkman Elctrns., Inc. 919-722-9131,800-334-8688
OH Columbus, Electronics Mktg. Corp. 614-299-4161
OH Highland Hgts., Electronics Mktg. Corp. 216-442-3441
OK Tulsa, Radio, Inc. 919-587-9123
OR Portland, Minarik Elc. Co. 503-253-3402
PA Harrisburg, Ad-Tech Elctrns. 717-939-8337
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WA Seattle, Platt Elec. 206-624-4083
WI Milwaukee, Marsh Elctrns. Corp. 414-475-6000

E-A-R DIV., Cabot Corp., 7911 Zionsville Rd., Indianapolis, IN 46268, Tel: 317-872-1111, TWX: 810-341-3412, FAX: 317-872-0617; *Sls. Mgr.:* Lawrence K. Landers

EASCO/K D TOOLS, See Hunter Tools, Easco/K D Tools

EAST CONTROLS, 6851 Church St., Hanover Park, IL 60103, Tel: 312-837-7709; Empl.: 1

EASTERN AIR DEVICES, INC., 1 Progress Dr., Dover, NH 03820, Tel: 603-742-3330, FAX: 603-742-9080; Empl.: 175 ..... **B•1240**

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CA San Jose, Motion Sys. 408-246-0641
CO Boulder, R. G. Entprs. 303-447-9211
FL Orlando, Werndli & Assoc. 407-851-1923
MN St. Paul, REPCO 612-488-0201
NH Dover, Eastern Air Dvs. 603-742-3330
NJ Ridgefield, Rical Assocs. 201-945-5250
NY Rochester, Elcom Sls. 716-385-1400
NY Syracuse, ELCOM Sls. 315-685-8245
NC Charlotte, Jake Rudisill Assocs. 704-377-6901
OH Cincinnati, KCH Co. 513-931-1686
OR Portland, D.A. Sullivan Co. 503-292-2448
PA Paoli, ETC Sales 215-296-3527
TX Dallas, D.J. Sls. Co. 214-783-8876
TX Richardson, D.J. Sls. 214-783-8876
WI Racine, KMG Sls., Inc. 414-639-9005

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ME Bangor, Bearings, Inc. 207-947-6583
MA Avon, Bearings, Inc. 508-584-9200
MA W. Springfield, Bearings, Inc. 413-739-4701
MA Wakefield, Bearings, Inc. 617-246-3906
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NH Berlin, Bearings, Inc. 603-752-6001
NH Dover, Bearings, Inc. 603-749-2121
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NC Charlotte, Motionex 704-377-6901
PA Pittsburgh, EXONIC Sys. 412-784-8400
RI Warwick, Bearings, Inc. 401-732-2600
VT Rutland, Bearings, Inc. 802-775-3550

EASTERN ELECTRONICS MFG. CORP., National Patent Dev. Corp., 180 Roberts St., East Hartford, CT 06108, Tel: 203-528-9821, FAX: 203-289-7639; FSC No.: 203-289-7639; Empl.: 200; *Sls. Mgr.:* Wayne M. Baker

EASTERN MARKING MACHINES, 422 S Franklin St, Hempstead, NY 11550, Tel: 516-483-7070, TELEX: 968095; Empl.: 8; *Sls. Mgr.:* George Rosales; *Dist. Mgr.:* L. Sherman

EASTERN MICROWAVE, 40 Ray Ave., Burlington, MA 01803, Tel: 617-273-4700; FSC No.: 30616; Empl.: 25; *Sls. Mgr.:* S. C. Lowe

EASY HEAT WIREKRAFT, See Electrical Systems, Div. of Bristol Corp.

EATON CORP, Durant Products, 901 S. 12th St, Watertown, WI 53094, Tel: 414-261-4070, TWX: 910-260-3713; Empl.: 350; *Sls. Mgr.:* H. L. Sisson; *Dist. Mgr.:* Dennis G. Walz

EATON CORP., Electronic Instrument Div., 5340 Alla Rd, Los Angeles, CA 90066, Tel: 213-822-3061, TWX: 910-343-6969; Empl.: 200; *Sls. Mgr.:* John Martocci

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GA	Atlanta, Eaton Corp./A & CCD	404-394-0911
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MI	Detroit, Eaton Corp./A & CCD	313-354-7513
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WI	Milwaukee, Eaton Corp./A & CCD	414-449-6709
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EBM INDUSTRIES, INC., 110 Hyde Road, Farmington, CT 06032, Tel: 203-674-1515, TWX: 710-423-8723, FAX: 203-674-8536; FSC No.: 62292; *Sls. Mgr.:* Robert Sobolewski ..... **C•1644-1649**

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CO	Littleton, Simpson Assocs.	303-794-8381
CT	Clinton, Selmark Assocs.	203-573-9088
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FL	Clearwater, Raycom, Imc.	813-572-4282
FL	Orlando, Raycom, Inc.	407-859-5504
FL	Wellborn, Raycom, Inc.	904-963-5023
GA	Marietta, Raycom	404-952-6061
IL	Glendale Hgts., Beta Technlg. Sls.	312-790-9886
IA	Des Moines, Houk & Assocs., Inc.	515-276-6741
KS	Overland Park, Web Elctrns.	913-381-7986
KY	Louisville, Tech. Prods.	502-896-8000
MD	Ellicott City, Mktg. Technlg.	301-465-5944
MA	Millis, Selmark Assocs.	508-376-2914
MI	Warren, Burcaw Co.	313-573-4605
MI	Wyoming, Burcaw	800-572-1610
MN	St. Paul, Arkco Sls.	612-777-7454
MO	Florissant, Web Elctrns.	314-921-5720
NH	Hopkinton, Selmark Assocs.	603-746-3299
NJ	Marlton, b.g.r. Assocs.	609-983-1020
NM	Albuquerque, Harris & Croy	505-275-9103
NY	Buffalo, NRM Mktg. Grp.	716-634-4300
NY	Frankilin Sq., Cooper-Simon & Co., Inc.	516-489-4636
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NC	Raleigh, Raycom	919-266-9827
OH	Dayton, Versatron	513-293-8506
OH	Maple Hgts., Versatron	216-581-0090
OK	Tulsa, Bonser-Philhower Sls.	918-745-9122
OR	Hillsboro, Temco Northwest	503-649-8375
PA	Harrison City, NRM Mktg. Grp.	412-327-0858
TX	Austin, Bonser-Philhower Sls.	512-346-9186
TX	Houston, Bonser-Philhower Sls.	713-782-4144
TX	Richardson, Bonser-Philhower Sls.	214-234-8438
UT	Midvale, Simpson Assocs.	801-566-3691
VA	Fairfax, Mktg. Technlg.	703-323-9640
WA	Kirkland, Temco Northwest	206-821-5434
WA	Maple Falls, Temco Northwest	206-599-2750
WA	Spokane, Temco Northwest	509-534-8635
WI	Milwaukee, Beta Technolg. Sls., Inc.	414-543-6609
PR	Bayamon, Selmark	809-797-9176

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AL	Huntsville, Powell Elec.	205-539-2731
AZ	Phoenix, Arizona Comps. Co.	602-269-5655
AZ	Tempe, Control Design Supp.	602-829-7981
AZ	Tempe, Supply Team Intl.	602-968-1192
AZ	Tucson, Southwest Sls.	602-628-1613
CA	Anaheim, Deco Elec.	714-630-8252
CA	Costa Mesa, Powell	714-754-1717
CA	Fullerton, Pyramid/Fullerton	714-773-0781
CA	Hollywood, Yale Elctrns.	818-465-3186
CA	Irvine, Integrated Elctrns.	714-837-9960
CA	Sacramento, Integrated Elctrns.	916-424-5297
CA	San Diego, Deco Elctrns.	619-693-1595
CA	San Diego, Pyramid	619-271-5404
CA	San Jose, Integrated	408-435-1000
CA	San Jose, Powell Elec.	408-943-9020
CA	Santa Clara, Pyramid Elctrns.	408-727-9810
CA	Sunnyvale, Power Supply Comps.	408-737-1333
CO	Denver, Integrated Elctrns.	303-292-6121
CO	Englewood, Indl. Elctrns.	303-694-9444
CT	Danbury, Pilgrim Elctrns.	203-792-7274
CT	E. Haven, J. V. Elctrns.	203-469-2321
CT	Wallingford, Cronin Elec.	203-265-3134
CT	Yalesville, Glynn Elctrns.	203-265-2498
FL	Ft. Lauderdale, Powell Elec.	305-484-8377
GA	Atlanta, ACK Radio Supp.	404-351-6340
GA	Fayetteville, Frankland	404-461-4026
IL	Hoffman Estates, I.E.C. Intercomp	312-843-2040
IL	Rosemont, Advent Elctrns.	312-297-6200
IN	Indianapolis, Advent Elctrns.	317-872-4910
IA	Cedar Rapids, Advent Elctrns.	319-363-0221
KY	Florence, U.R.I. Elctrns.	606-371-4423
MD	Baltimore, Resco/Baltimore	301-529-0500
MD	Beltsville, Resco/D.C.	301-937-9100
MD	Columbia, Powell	301-621-8080
MA	Canton, Impact Sls. Co.	617-821-1500
MA	Middleboro, Glynn Elctrns.	508-947-4262
MA	Needham, Cronin	617-449-5000
MA	Westborough, Powell	617-366-6100
MA	Wilmington, Heilind Elctrns.	617-657-4870
MA	Woburn, Control Design Supp.	617-932-9404
MI	Battle Creek, Great Lakes Elctrns.	616-963-6282
MI	Farmington Hills, Advent Elctrns.	313-477-1650
MN	Grand Rapids, S. F. Elctrns.	616-459-0216
MN	Minneapolis, Control Des. Supp.	612-721-1628
MO	Kansas City, L Comp	816-221-2400
MO	Maryland Hgts., L Comp	314-291-6200
NV	Carson City, Integrated Elctrns.	702-883-9399
NH	Manchester, Cronin	603-624-0105
NH	Manchester, Glynn Elctrns.	603-622-8131
NH	Nashua, Brevan Elctrns.	603-889-7230
NJ	Englewood, Powell Elec.	201-894-0800
NJ	Rockaway, Tonar	201-586-9000
NJ	W. Berlin, General Comps.	609-768-6767
NM	Albuquerque, Betatron	505-821-1122
NY	Farmingdale, Addem Sls.	516-752-9303
NY	Hauppauge, Broadline Elec. Distr.	516-231-4100
NY	Hicksville, Janesway Elctrns.	516-935-1827
NY	Lynbrook, Peerless Radio	516-593-2121
NY	Mt. Vernon, Janesway Elctrns.	914-699-6710
NY	Rochester, Simcona	716-328-3230
NY	Suffern, Nobel Elctrns.	914-357-4500
NC	Cary, Powell Elec.	919-467-1212
NC	Raleigh, Century	919-782-2116
OH	Akron, Akron Elctrns.	216-762-8818
OH	Broadview Hgts., Related Comps.	216-838-4838
OH	Cincinnati, URI Elctrns.	513-761-4030
OH	Dayton, Related Comps.	513-253-6116
OH	Twinsburg, Advacom	216-425-8477
OR	Beaverton, Integrated Elctrns.	503-641-1690
PA	Export, Advacom	412-733-5400
PA	Malvern, Control Design Supp.	215-296-0150
PA	McKean, Advacom/Erie	814-476-7774
PA	Norristown, Century Elctrn. Comp. Co.	215-631-5400
PA	Philadelphia, Powell	215-365-1900
TN	Hixson, Techni-Tronics	615-843-0170
TX	Carrollton, TMMI, Inc.	214-960-6901
TX	Dallas, Omni Pro Elctrns.	214-233-0500
TX	Irving, Powell Elctrns.	214-550-0547
TX	Richardson, Janesway Elctrns.	214-437-5125
UT	N. Salt Lake, Integrated Elctrns.	801-298-1868
UT	Salt Lake City, Standard Supp. Co.	801-486-3371
WA	Bellevue, Integrated Elctrns./Jaco	206-455-2727
WA	Redmond, Pyramid Elctrns.	206-883-7200
WA	W. Seattle, Radar Elec.	206-282-2511
WI	Mequon, Taylor Elec. Co.	414-241-4321
WI	New Berlin, Control Design Supp.	414-784-1015

EBY COMPANY, 4300 H Street, Philadelphia, PA 19124, Tel: 215-537-4700, TWX: 710-670-0452, FAX: 215-537-4780; FSC No.: 72825; Empl.: 75; *Sls. Mgr.:* Maurice Sterling

ECG, 14123 21st Ave. N., Plymouth, MN 55441, Tel: 612-554-0720

ECOSOFT, INC., 6413 N. College Ave., Indianapolis, IN 46220, Tel: 317-255-6476, FAX: 317-251-4604; Empl.: 3; *Sls. Mgr.:* Emma Alkire

ECS COMPOSITES, 3560 Rogue River Hwy., Box 188, Grants Pass, OR 97526, Tel: 503-476-8871, TWX: 510-755-0777; FSC No.: 24995; Empl.: 135; *Sls. Mgr.:* John L. Smith ..... **C•1022-1023**

Local Sales Offices & Reps

AL	Huntsville, EMA	205-830-4030
CA	Laguna Hills, WESTEC	714-770-6229
CA	Long Bch., John Aram	213-597-4299
CA	Mtn. View, Kim Buurma	415-962-9027
CO	Englewood, Electronic Comp. Sys.	303-762-9576
FL	Orlando, Honeyco, Inc.	305-299-1000
MD	Baltimore, Burgin-Kreh Assocs.	301-265-8500
MA	Westwood, Apex Assocs.	617-326-5042
NJ	Teaneck, Noreast Tech. Sls.	201-833-2044
OR	Grants Pass, ECS Inc.	503-476-8871
PA	Horsham, Jacobsen Assocs.	215-674-2937
TX	Dallas, Advance Tech. Sls.	214-340-1300
WA	Bellevue, Comtec	206-453-1188
Can	Stittsville, Ont., Production Case Co.	613-836-2248

Ectron CORPORATION

FAX: 619-278-0372

ECTRON CORP., 8159 Engineer Rd., San Diego, CA 92111, Tel: 619-278-0600, TWX: 910-335-1259; FSC No.: 24856; Empl.: 50; *Sls. Mgr.:* W. W. Hanford ..... **D•1010**

Local Sales Offices & Reps

AZ	Phoenix, Aztec Entprs.	602-944-9185
CA	Canoga Pk., FLW Inc.	818-719-0037,
CA	Costa Mesa, FLW Inc.	714-751-7512
CA	Fremont, FLW Inc.	415-651-6511
CO	Denver, Aztec Entprs.	303-779-5285
FL	Melbourne, Saber Assocs.	407-724-0920
GA	Norcross, Saber Assoc. Inc.	800-327-0853
IL	Elmhurst, Sector Engrg. Sls.	312-530-7850
IN	Indianapolis, Sector Engrg. Sls.	317-842-1120
KS	Overland Pk., Ramsey Assocs.	913-541-1007
LA	Baton Rouge, Sesco	504-383-9237
MD	Laurel, Elctrn. Mktg. Assoc.	301-792-9300
MA	Needham, Addelco Corp.	617-444-4754
MI	Troy, Satullo Assocs.	313-585-4811,
MN	Minneapolis, Sector Eng. Sls. Inc.	612-593-1809
MO	St. Louis, Ramsey Assocs.	314-532-9386

NM Albuquerque, Westfhal & Assocs. 505-881-0995,
NY Plainview, Eastern-Metro Assoc. 516-931-1414
NY Victor, Sanwal Technlgs. 716-924-1950
NC Clayton, Saber Assocs. 800-327-0853
OH Cleveland, Instrmn. Sys. 216-845-8800
OH Dayton, Instrmn. Sys. 513-294-2838
PA Pittsburgh, Instrmn. Sys. 412-823-7005
PA Plymouth Meeting, Elctrn. Mktg. Assoc. 215-828-7400
SC Columbia, Saber Assoc. Inc. 800-327-0853
TX Dallas, Sesco 512-892-2490
TX Houston, Sesco 713-495-6362
UT Ogden, Aztec Entprs. 801-621-1655
WA Seattle, Datacom Assoc. Inc. 206-285-2525
WI Milwaukee, Sector Eng. Sls. Inc. 414-352-8280

EDAC INC., 40 Tiffield Rd, Scarborough, Ont., CAN M1V 5B6, Tel: 416-754-3322, FAX: 416-754-3299; FSC No.: 31781; Empl.: 110; *Sls. Mgr.:* (CAN) Don Willis; *Dist. Mgr.:* W. Mango

EDA INSTRUMENTS, INC., 4 Thorncliffe Park Dr., Toronto, ON, Canada M4H1H1, Tel: 416-425-7800, TELEX: 06 23222 FEDA TOR, FAX: 416-425-8135; Empl.: 100; *Sls. Mgr.:* Scott Hepburn

EDCLIFF DIV., Systron Donner, 1711 So. Mountain Ave., Monrovia, CA 91016, Tel: 818-358-4571, FAX: 818-359-5719; FSC No.: 00153; Empl.: 110; *Sls. Mgr.:* Cosmo L. Avellis; *Dist. Mgr.:* Fred Paciocco

EDL, INC., 385 Oser Ave., Hauppauge, NY 11788, Tel: 516-435-2808, 1-800-DIAL EDL, FAX: 516-435-2836; Empl.: 50; *Sls. Mgr.:* Ann Marie Capuano

EDO CORP./ELINCO DIV., See Electrical Indicator Co., Inc.

EDO WESTERN CORP., EDO Corp., 2645 South 300 W., Salt Lake City, UT 84115, Tel: 801-486-7481, TELEX: 388-315, FAX: 801-484-3301; Empl.: 360; *Sls. Mgr.:* Ken Etulain

EDSYN, INC., 15958 Arminta Ave., Van Nuys, CA 91406, Tel: 818-989-2324, 213-873-5115, TELEX: 65-1469; *Sls. Mgr.:* Wayne Murry

EDWARDS CO., Signaling Prods. Div., P.O. Box 1188, Farmington, CT 06034, Tel: 203-678-0410; Empl.: 1000; *Sls. Mgr.:* Al Canevari; *Dist. Mgr.:* Al Canevari

EECO INCORPORATED, 1601 E. Chestnut Ave., P.O. Box 659, Santa Ana, CA 92702-0659, Tel: 714-835-6000; Empl.: 850; *Sls. Mgr.:* Greg Littler; *Dist. Mgr.:* Dick Fried ..... **B•1726-1727**

Local Sales Offices & Reps

CA Santa Ana, Jones & McGeoy Sls., Inc. 714-547-6466
AL Huntsville, Montgomery Mktg., Inc. 205-830-0498
AZ Scottsdale, S.W. Sls. 602-991-1937
CA Los Altos, Recht Assocs. 415-964-6321
CA San Diego, Harvey King Inc. 619-587-9300
CO Denver, Delltron Co. 303-741-2122
CT S. Windsor, Northeast Reps., Inc. 203-267-6914
FL Altamonte Springs, Carter Assocs. 402-260-5566
FL Pompano Beach, Carter Assocs. 305-972-9455
GA Norcross, Montgomery Mktg., Inc. 404-447-6124
IL Elk Grove Village, TriStar Grp., Inc. 312-593-0200
IN Fort Wayne, M/S Sls. & Assoc. 219-436-3023
IN Indianapolis, M/S Sls. & Assocs. 317-881-0110
IA Cedar Rapids, Palatine Engr. & Sls., Inc. 319-365-8071
KS Blue Springs, Palatine Engr. & Sls., Inc. 816-229-4007
MD Laurel, EMA, Inc. 301-953-7800
MA Hingham, Northeast Reps., Inc. 617-749-8700
MI Livonia, Lowell-Wendt Mktg. Co. 313-464-2722
MI Wyoming, Lowell-Wendt Mktg. Co. 606-457-0900
MN Minneapolis, R.K. Sls. Assocs., Inc. 612-571-1001
MO Hazelwood, Palatine Engr. & Sls., Inc. 314-839-0800
NH Milford, Northeast Reps., Inc. 603-673-1406
NJ Englewood, Tecnimat 201-569-4200
NY Clarence Ctr., Tech-Mark, Inc. 716-741-9138
NY Mendon, Tech-Mark, Inc. 716-624-3840
NY Utica, Tech-Mark, Inc. 315-733-0575
NC Cary, Montgomery Mktg. 919-467-6319
NC Raleigh, Montgomery Mktg. 919-851-0010
OH Aurora, Engrg. Mktg. Assocs. 216-562-6104
OH Centerville, Engrg. & Mktg. Assocs. 513-433-2800
OK Tulsa, West Assocs. 918-665-3465
OR Beaverton, Blair Hirsh Co. 503-641-1875
PA Huntingdon Valley, Omega Elctrn. Sls. 215-947-4135
TX Austin, West Assocs. 512-339-6886
TX El Paso, S.W. Sls. 915-594-8259
TX Houston, West Assocs. 713-621-5983
TX Richardson, West Assocs. 214-680-2800
WA Lynnwood, Blair Hirsh Co. 206-774-8151
WI Brookfield, TriStar Grp., Inc. 414-782-2670
Can Montreal, Renmark 514-594-8679
Can Napean, Ont., Renmark Elctms. Ltd. 613-727-0320
Can Piedmont, P.Q., Renmark Elctms. Ltd. 514-594-8679
Can Richmond Hill, Ont., Renmark Elctms. Ltd. 416-881-8844

Local Distributors

CA Santa Monica, Master Distrs. 213-452-1229
AL Huntsville, Hall-Mark Elctms. 205-837-8700
AL Huntsville, Marshall Inds. 205-881-9235
AZ Phoenix, Hall-Mark Elctms. 602-437-1200
AZ Phoenix, Marshall Inds. 602-496-0290
AZ Tempe, Harper SID 602-967-1464
CA Canoga Park, Hall-Mark Elctms. 213-217-8400
CA Chatsworth, Hall-Mark Elctms. 818-773-4500
CA Chatsworth, Marshall Inds. 818-407-4100
CA Compton, Harper SID 213-979-5090
CA El Monte, Marshall Inds. 818-459-5500
CA Irvine, Marshall Inds. 714-458-5301
CA Milpitas, Marshall Inds. 408-942-4600
CA Rancho Cordova, Marshall Inds. 916-635-9700
CA San Diego, Hall-Mark Elctms. 619-268-1201
CA San Diego, Harper SID 619-578-2500
CA San Diego, Marshall Inds. 619-578-9600
CA San Jose, Hall-Mark Elctms. 408-432-0900
CA Santa Clara, Master Dists. 408-496-6151
CA Santa Fe Springs, MICRONET Computer Sys. 213-921-0068
CA Sunnyvale, Marshall Inds. 408-942-4600
CA Sunnyvale, Time Electronics 408-734-9888
CA Tustin, Hall-Mark Elctms. 714-669-4700
CO Englewood, Hall-Mark Elctms. 303-790-1662
CO Thornton, Marshall Inds. 303-451-8383
CT Wallingford, Hall-Mark Elctms. 203-269-0100
CT Wallingford, Marshall Inds. 203-265-3822
CT Wallingford, Sager Electrical Supply Co. 203-265-4600
FL Clearwater, Hall-Mark Elctms. 813-541-7440
FL Orlando, Hall-Mark Elctms. 305-855-4020
FL Orlando, Marshall Inds. 305-767-0505
FL Pompano Beach, Hall-Mark Elctms. 305-971-9280
GA Norcross, Hall-Mark Elctms. 404-447-8000
GA Norcross, Marshall Inds. 404-923-5750
IL Schaumburg, Marshall Inds. 312-490-0155
IL Wood Dale, Hall-Mark Elctms. 312-860-3800
IN Indianapolis, Hall-Mark Elctms. 317-872-8875
IN Indianapolis, Mar Elctms., Inc. 317-633-6699
IN Indianapolis, Marshall Inds. 317-297-0483
KS Lenexa, Hall-Mark Elctms. 913-888-4747
KS Lenexa, Marshall Inds. 913-492-3121
MD Baltimore, Hall-Mark Elctms. 301-988-9800
MD Silverspring, Marshall Inds. 301-622-1118
MA Billerica, Hall-Mark Elctms. 617-667-0902
MA Hingham, Sager Elctrn. Supp. Co. 617-749-6700
MA Wilmington, Marshall Inds. 617-658-0810
MI Livonia, LWC Distrs. 313-464-7700
MN Eden Prairie, Hall-Mark Elctms. 612-941-2600
MN Plymouth, Marshall Inds. 612-559-2211
MO Earth City, Hall-Mark Elctrn. 314-291-5350
MO Maryland Hgts., Chelsea Inds. 314-997-7709
NJ Fairfield, Hall-Mark Elctms. 201-530-4543
NJ Fairfield, Marshall Inds. 201-882-0320
NJ Mt. Laurel, Marshall Inds. (Philadelphia Div.) 215-627-1920
NM Albuquerque, International Elctms. 505-293-3497
NY Buffalo, Summit Distrs. 716-887-2800
NY Hauppauge, Marshall Inds. 516-273-2424
NY Johnson City, Marshall Inds. 716-798-1611
NY Lynbrook, LI., Peerless Radio Corp. 516-593-2121
NY Rochester, Marshall Inds. 716-235-7620
NY Ronkonkoma, Hall-Mark Elctms. 516-737-0600
NC Raleigh, Hall-Mark Elctms. 919-872-0712
NC Raleigh, Marshall Inds. 919-878-9882
OH Dayton, Marshall Inds. 513-898-4480
OH Solon, Hall-Mark Elctms. 216-349-4632
OH Solon, Marshall Inds. 214-248-1788
OH Worthington, Hall-Mark Elctms. 614-888-3313
OR Beaverton, Almac Elctms. 503-629-8090
OR Beaverton, Marshall Inds. 503-644-5050
PA Mt. Laurel, Marshall Inds. 215-627-1920
TX Austin, Hall-Mark Elctms. 512-258-8848
TX Austin, Marshall Inds. 512-837-1991
TX Carrollton, Marshall Inds. 214-233-5200
TX Dallas, Hall-Mark Elctms. 214-341-1147
TX El Paso, International Elctms. 915-598-3406
TX Harper SID, Harper Sls. 214-621-0500
TX Houston, Hall-Mark Elctms. 713-781-6100
TX Houston, Marshall Inds. 713-895-9200
UT Salt Lake City, Marshall Inds. 801-485-1551
UT West Valley, Hall-Mark Elctms. 801-972-1008
WA Bellevue, Almac Elctms. 206-643-9992
WA Bothell, Marshall Inds. 206-486-5747
WA Spokane, Almac Elctms. 509-924-9500
WI New Berlin, Hall-Mark Elctms. 414-797-7844
WI Waukesha, Marshall Inds. 414-797-8400
Can Burnaby, BC, RAE Indl. Elec. Ltd. 604-291-8866
Can Calgary, Alb., Cardinal Ind. Elec. Ltd. 403-259-6817
Can Calgary, Alta., Future Elctms. 403-235-5325
Can Downsview, Ont., Future Elctms. 416-638-4771
Can Edmonton, Alb., Cardinal Ind. Elec. Ltd. 403-483-6266
Can Edmonton, Alta., Future Elctms. 403-438-2858
Can Montreal, Que., EMJ Data Sys. Ltd. 514-849-4171
Can Nepean, Ont., Carsten Elctms., Ltd. 613-726-9250
Can Ottawa, Ont., Future Elctms. 613-820-8313
Can Pointe Claire, Que., Future Elctms. 514-694-7710
Can Scarborough, Ont., Carsten Elctms., Ltd. 416-495-9999
Can St. Laurent, Que., Carsten Elctms., Ltd. 514-334-8321
Can Vancouver, BC, EMJ Data Sys. Ltd. 604-732-7268
Can Vancouver, BC, Future Elctms. 604-438-5545
CA Sunnyvale, Harper SID 408-943-9490

EEMCO DIV., Datron Systems Inc., 4585 Electronics Pl, Los Angeles, CA 90039, Tel: 818-247-7060, TWX: 910-497-2269, FAX: 818-244-6621; FSC No.: 72121; Empl.: 300; *Sls. Mgr.:* Russell Johnson

EEV INC., 4 Westchester Plaza, Elmsford, NY 10523, Tel: 914-592-6050, TELEX: 6818096, FAX: 914-682-8922; Empl.: 42; *Sls. Mgr.:* Jim Fisher

EFECTOR, INC., 805 Springdale Dr., Exton, PA 19341, Tel: 215-524-2000, 800-441-8246, TELEX: 84-6437, FAX: 215-524-2010; Empl.: 35; *Sls. Mgr.:* J. Kelly

EFI ELCTRNS., 2415 South 2300 West, Salt Lake City, UT 84119, Tel: 801-977-9009:800-221-1174, FAX: 801-977-0200; Empl.: 75; *Sls. Mgr.:* Mark A. Norrie

EFRATOM, See Ball Corp., Efratom Div.

ELECTRO NATIONAL, Matthews Ave., Canton, MS 39046, Tel: 601-859-5511, TWX: 810-990-0938, FAX: 601-859-5518; FSC No.: M-54208; Empl.: 40; *Sls. Mgr.:* Patsy Hicks

ELECTRONETICS, INC., Paine Field Bldg 335, Everett, WA 98204, Tel: 206-355-1855; Empl.: 10

ELECTRONIC APPLICATIONS CO., 4918 Santa Anita Ave., PO Box 4308, El Monte, CA 91734, Tel: 818-442-3212, TWX: 910-587-3351, FAX: 818-442-6873; Empl.: 60; *Sls. Mgr.:* Betsy Spencer

ELECTRONIC ASSOCIATES, INC., 185 Monmouth Pkwy, W. Long Branch, NJ 07764, Tel: 201-249-7069, FAX: 201-229-1329; *Dist. Mgr.:* Anthony Epifane

ELECTRONIC COIL CORP., Farmington Industrial Park, Farmington, CT 06032, Tel: 203-677-6731, FAX: 203-677-1902; Empl.: 67; *Sls. Mgr.:* Raymond Gorski, Jr.

ELECTRONIC COMPONENT ASSEMBLY, INC., 7181-Construction Ct., San Diego, CA 92121, Tel: 619-549-0808; Empl.: 180; *Sls. Mgr.:* Denise N. Winter

EG&G, INC., Electro-Optics Div., 35 Congress St., Salem, MA 01970, Tel: 508-745-3200, TELEX: 681-7405 EGGSA; FSC No.: 25506; Empl.: 500; *Sls. Mgr.:* J. Murachver

EG&G, INC., Electronics Components Div., 35 Congress St., Salem, MA 01970, Tel: 508-745-3200, TELEX: 681-7405 EGGSA; FSC No.: 25506; Empl.: 500; *Sls. Mgr.:* J. Murachver

EG&G, INC., Photon Devices, 35 Congress St., Salem, MA 01970, Tel: 617-745-3200, TELEX: 681-7405 EGSA; FSC No.: 25506; Empl.: 500; *Sls. Mgr.:* James Melnyk

EG & G ALMOND INSTRUMENTS, 1330 E. Cypress St., Covina, CA 91724, Tel: 818-967-9521, TWX: 910-584-1320, FAX: 818-967-3151; Empl.: 380; *Sls. Mgr.:* Dave Adams ..... **D•1734-1735**

Local Sales Offices & Reps

FL Orlando, Truex Assocs. 305-859-2160
NY Yonkers, Sonkin Assocs. 914-968-8282

EG & G BIRTCHER, EG & G, Inc., 4505 N. Arden Dr./P. O. Box 5268, El Monte, CA 91734-1268, Tel: 818-442-2572, TELEX: 247345 EGGUR, FAX: 818-442-8127; FSC No.: 18915; Empl.: 167; *Sls. Mgr.:* H. Robert Sproul; *Dist. Mgr.:* H. Robert Sproul ..... **C•1024-1025**

Local Sales Offices & Reps

AL Huntsville, Remco 205-533-3763
AZ Phoenix, Mercury Engrg. Sls. 602-244-0123
AZ Phoenix, Mercury Engrg. Sls., Inc. 602-265-0344
CA Brea, Masco 714-529-0866
CA San Diego, Masco 619-234-6905
CA Santa Clara, Nova-Tronix, Inc. 408-727-9530

CO Broomfield, Connors Co. 303-466-9628
FL Clearwater, HHP, Assocs. 813-797-4447
FL Pompano Beach, HHP Assocs., Inc. ... 305-971-5750
GA Atlanta, Remco 404-447-9637
IL Rollings Meadows, Heartland Technlg. Mktg., Inc. 312-577-9222
KS Shawnee Mission, M-S-B Assocs., Inc. 913-262-5500
MD Ellicott City, Eastern Tech. Corp. 301-461-7720
MA Needham Hgts., Coakley, Boyd & Abbett 617-444-5470
MN Minneapolis, Hei-Lite Sls., Inc. 612-861-6051
NY Great Neck, Coakley, Boyd A Bett/Tylinsky 516-466-9070
NY Syracuse, IA Hotze Assocs. 315-479-6641
OH Cleveland, Jim Finnegan & Co. 216-398-6300
OH Dayton, Jim Finnegan & Co. 513-890-8322
OR Beaverton, Eclipse Mktg. Grp. 503-642-1661
PA Doylestown, Monteiro Assocs., Inc. 215-345-5855
PA Pittsburgh, Jim Finneagan & Co. 412-823-5400
TX Dallas, El-Com Mktg., Inc. 214-241-2166
TX Houston, El-Com Mktg. 713-350-8064
WA Redmond, Eclipse Mktg. Grp. 206-885-6991
Can Bolton, Ont., P.J. Heenan, Ltd. 416-857-4741

Local Distributors

CA Manhattan Beach, Prime Electro Prods. 213-379-3642
CO Aurora, Jet Elctrns. Supp. Co., Inc. 303-364-1000
CT S. Windsor, Car-Lac Elctrns. 203-282-0631
MA Milford, Car-Lac Elctrns. 508-478-7797
MA Winchester, Rush Inds., Inc. 617-729-5800
MN Minneapolis, Stark Elctrns., Inc. 612-332-1325
NY Bohemia, Car Lac Inds. Sls., Inc. 516-567-4200
NY Buffalo, Summit Distrs. 716-887-2800
NY Rochester, Summit Distrs. 716-334-8110
OH Englewood, Argent Inds. 513-836-8633
OR Beaverton, Murphy Elctrns. 503-642-2001
TX Ft. Worth, Industrial Elctrns. 817-731-7321
WA Redmond, Murphy Elctrns. 206-881-1234
Can Mississauga, Ont., Rush Elctrns. 416-677-7280

EG & G FLOW TECHNOLOGY, INC., Box 52103, Phoenix, AZ 85072, Tel: 602-437-1315, TELEX: 187-163; Empl.: 75; *Sls. Mgr.:* Ed Dahn

EG & G FREQUENCY PRODUCTS INC., EG & G Inc., 4914 Gray Rd., Cincinnati, OH 45232, Tel: 513-542-5555, TWX: 810-461-2749, FAX: 513-542-5146; FSC No.: 58997; Empl.: 300; *Sls. Mgr.:* G.Mullikin, M. Schwalje, W. Wilson

EG&G GAMMA SCIENTIFIC, Div. of EG&G Inc., 3777 Ruffin Rd., San Diego, CA 92123, Tel: 619-279-8034, TELEX: 697938, FAX: 619-576-9286; Empl.: 50; *Sls. Mgr.:* Robert Ruff

EG&G GEOMETRICS, Div. of EG&G Inc., 395 Java Dr., Sunnyvale, CA 94089, Tel: 408-734-4616, TELEX: 657435, FAX: 408-745-6131; FSC No.: 34314; *Dist. Mgr.:* Doug Crice

EG & G JUDSON, 221 Commerce Dr., Montgomeryville, PA 18936, Tel: 215-368-6900, TELEX: 846120, ESYLNK: 62820476, FAX: 215-362-6107; Empl.: 65

EG&G RETICON, Div. of EG&G, 345 Potrero Ave., Sunnyvale, CA 94086-4197, Tel: 408-738-4266, TWX: 910-339-9343, FAX: 408-738-6979; *Sls. Mgr.:* John Skurla

EG & G ROTRON, Custom Div., Hasbrouck La., Woodstock, NY 12498, Tel: 914-679-5201, FAX: 914-679-7080; FSC No.: 82877; *Sls. Mgr.:* Mike Lyon; *Dist. Mgr.:* Mary Fellows

EG&G ROTRON, Industrial Division, North Street, Saugerties, NY 12477, Tel: 914-246-3401, TELEX: 981511, FAX: 914-246-3802; FSC No.: 551496; Empl.: 55; *Sls. Mgr.:* Jay Jarboe; *Dist. Mgr.:* Jay Jarboe

EG & G VACTEC, 10900 Page Blvd., St. Louis, MO 63132, Tel: 314-423-4900, TWX: 910-764-0811, FAX: 314-423-3956; Empl.: 250; *Sls. Mgr.:* D. Hartley; *Dist. Mgr.:* D. Hartley ..... **B•1321**

Local Sales Offices & Reps

CA Encino, King-Way Assocs. 818-788-4124
CO Buena Vista, C-Tech 303-395-2025
FL Orlando, EAB Assocs. 305-898-7444
IL Highland Park, T. B. Hunter Assocs. 312-433-7000
IN Fort Wayne, Scott Elctrns. 219-484-7865
IN Indianapolis, Scott Elctrns. 317-841-0010
MD Laurel, R. W. Mitscher Co. 301-498-6090
MA Norwood, MacInnis Co. 617-762-8090
MI Southfield, O.E.M. Technical Sls. 313-444-1680
MN Eden Prairie, Rockmore Sls. 612-941-1390
MO St. Louis, Acorn Elctrns. 314-644-2510
NJ Marlton, B.G.R. Assocs. 609-428-2440
NY Pittsford, C. W. Beach Co. 716-586-3200
NY Syracuse, C. W. Beach Co. 315-446-9587
OH Cincinnati, Scott Elctrns. 513-791-2513
OH Cleveland, Scott Elctrns. 216-473-5050
OH Dayton, Scott Elctrns. 513-294-0539
OH Reynoldsburg, Scott Elctrns. 614-863-1281
TX Richardson, Interactive Comps. 214-669-2277
VA Shipman, R. W. Mitscher Co. 804-263-5154

Local Distributors

CA Encino, King Way West 818-788-4124
CA Palo Alto, Zack Elctrns. 415-326-5432
CA Santa Clara, Allied Elctrns. 408-727-1690
FL Orlando, Nico 305-898-7444
IL Chicago, Newark Elctrns. 312-638-4411
IL Elgin, Allied Elctrns. 312-697-8200
MO St. Louis, Olive Indl. Elec. 314-426-4500
OH Dayton, Televox, Inc. 513-294-4499
TX Fort Worth, Allied Elctrns. 817-336-5401

EG&G WAKEFIELD ENGINEERING

FAX: 617-246-0874

EG & G WAKEFIELD ENGINEERING, 60 Audubon Rd., Wakefield, MA 01880, Tel: 617-245-5900; Empl.: 250; *Sls. Mgr.:* Frank Casdia; *Dist. Mgr.:* Carl Swanson ..... **C•1651**

Local Sales Offices & Reps

AL Huntsville, Over & Over, Inc. 205-837-7105
AZ Phoenix, Sanford Sls. 602-957-3570
CA Los Altos, Recht Assocs. 415-964-6321
CA San Diego, Mesa Elctrns. 619-278-8021
CO Denver, Delltron Co. 303-373-0300
FL Tampa, Over & Over Inc. 813-626-9100
GA Norcross, Over & Over, Inc. 404-449-6205
IL Rolling Meadows, Sumer, Inc. 312-991-8500
IA Cedar Rapids, C. H. Horn Assocs. 319-393-8703
MD Timonium, Bresson Assocs. 215-664-6460
MI Livonia, Luebbe Sls. 313-477-3131
MN Mendota Heights, G-II Sls. 612-454-3086
MO St. Louis, John Macke Co. 314-432-2830
NY Commack, ERA, Inc. 516-543-0510
NY E. Rochester, Tri Tech Elctrns. 716-385-6500
NY Fayetteville, Tri Tech Elctrns. 315-446-2881
NC Charlotte, Over & Over, Inc. 704-542-9111
OH Cincinnati, Luebbe Sls. Co. 513-530-0600
OH Cleveland, Luebbe Sls. Co. 215-333-0425
OR Lake Oswego, RTS Inc. 503-244-4123
PA Narbeth, Bresson Assocs. 215-664-6460
TX Austin, Milco Mktg. 512-453-3023
TX Richardson, Milco Mktg. 214-783-2716
TX Stafford, Milco Mktg. 713-723-5003
UT Sandy, Delltron Co. 801-942-4678
VA Forrest, Bresson, Assocs. 215-664-6460
WA Vashon, RTS Inc. 206-285-1363
WI Brookfield, Sumer, Inc. 414-784-6641

Local Distributors

AL Birmingham, Newark 205-942-4044
AZ Phoenix, Wyle 602-249-2232
AZ Tempe, Bell 602-966-7800
AZ Tempe, Newark 602-968-7441
CA Buena Pk., Cypress 213-521-5230
CA El Segundo, Wyle 213-322-8100
CA Foster City, Newark 415-572-8300
CA Fountain Valley, Comp. Center 714-979-0433
CA Garden Grove, Bell 714-220-0681
CA Gardena, Bell 213-515-1800
CA Inglewood, Newark 213-678-0441
CA Irvine, Wyle 714-863-9953
CA Rancho Cordova, Wyle 916-638-5282
CA Roseville, Bell 916-969-3100
CA San Diego, Bell 619-268-1277
CA San Diego, Cypress 619-292-5611
CA San Diego, Newark 619-481-1251
CA San Diego, Wyle 619-565-9171
CA Santa Ana, Elcom 213-404-2961
CA Santa Ana, Wyle 408-727-2500
CA Santa Clara, Comps. Ctr. 408-988-3751
CA Santa Clara, Cypress 408-435-8400
CA Sunnyside, Bell 408-734-8570
CA Thousand Oaks, Bell 805-499-6821
CO Denver, Newark 303-757-3351
CO Thornton, Wyle 303-457-9953
CO Wheat Ridge, Bell 303-424-1985
CO Wheat Ridge, Cypress 303-431-2622
CT Bloomfield, Newark 203-243-1731
CT S. Windsor, Carlac 203-282-0631
CT Wallingford, Midan 203-265-2077
FL Casselberry, AFCOM 305-767-6565
FL Ft. Lauderdale, Newark 305-587-2372
FL Graham/Largo, Bell 813-541-4434
FL Lake Mary, Elctrn. Fasteners 305-321-4000
FL Miami, Elctrn. Equip. 305-871-3500
FL Orlando, Newark 305-896-8350
GA Atlanta, Newark 404-448-1300
GA Norcross, Bell 404-662-0923
GA Norcross, Specialty 404-458-6341
IL Chicago, Bell 312-640-1910
IL Chicago, Newark 312-784-5100
IL Elk Grove VL, GBL Elec. 312-593-3220
IN Carmel, Altex 317-848-1323
IN Ft. Wayne, Bell 219-423-3422
IN Indianapolis, Bell 317-634-8202
IN Indianapolis, Newark 317-298-7070
IN Lafayette, Bell 317-423-5564
IA Cedar Rapids, Bell 319-395-0730
IA Cedar Rapids, Dee Elctrns. 319-365-7551
IA Cedar Rapids, Newark 319-362-1171
KS Lenexa, Newark 913-492-6000
KS Wichita, RSC 316-267-5213
KY Louisville, Newark 502-423-0280
KY Metarie, Newark 504-888-5174
LA Shreveport, Indl. Elec. Supp. 318-222-9459
MD Beltsville, Newark 301-937-5085
MD Columbia, G.R.S. 301-995-6744
MD Rockville, Capitol Radio Whlsrs. 301-881-2270
MA Canton, Impact Sls. 617-821-1500
MA Milford, CAR-LAC 617-478-7797
MA Norwood, Emtel Elctrns. 617-769-9500
MA Winchester, Rush Inds. 617-729-5800
MA Woburn, JACO 617-933-7760
MA Woburn, Newark 617-935-8350
MI Ann Arbor, Bell 313-971-9093
MI Ann Arbor, Wedemeyer 313-665-8611
MI Grand Rapids, Newark 616-241-6681
MI Livonia, RS Elec. 313-525-1155
MN Minneapolis, Newark 612-331-6350
MN St. Paul, Gophers 612-483-3322
MO Hazelwood, Newark 314-731-1204
MO St. Louis, Newark 314-298-2505
NE Omaha, Newark 402-392-1221
NJ Camden, G.R.S. 609-964-8560
NJ Clifton, Engrd. Assemblies 201-340-0600
NJ E. Hanover, Delburn 201-884-0800
NJ Kenilworth, Newark 201-272-8410
NJ Penshauken, Newark 609-663-9490
NJ Springfield, Route Elec. 201-379-7710
NM Albuquerque, Bell 505-292-2700
NY Bohemia, Car-Lac 516-567-4200
NY Buffalo, Genesee Radio 716-873-9661
NY Buffalo, Summit 716-884-3450
NY Commack, CAR-LAC 516-282-0631
NY Farmingdale, Semispecialists 516-293-2710
NY Hauppauge, JACO 516-273-5500
NY Henrietta, CAM/RPC 716-334-5600
NY Rochester, Newark 716-473-6600
NY Rochester, Summit 716-334-8110
NY Suffern, Nobel Elec. 914-357-4500
NY Valley Stream, Newark 516-887-2100
NC Greensboro, Newark 919-292-7240
NC Raleigh, Southeastern Elctrns. 919-828-2311
NC Winston-Salem, Kirkman Elec. 919-722-9131
OH Cincinnati, Bell 513-772-1661
OH Cincinnati, Hughes Peters 513-351-2000
OH Cleveland, CAM/Ohio 216-461-4700
OH Cleveland, Darrah 216-631-0912
OH Columbia, Newark 614-451-0002
OH Columbus, Bell 614-895-1590
OH Columbus, Hughes Peters 614-294-5351
OH Dayton, Bell 513-434-8231
OH Dayton, Stotts Friedman 513-298-5555
OH Warren, REM Elec. 216-373-1300
OK Oklahoma City, Newark 405-495-5000
OK Tulsa, Altair 918-252-5781
OK Tulsa, Radio Inc. 918-587-9123
OR Beaverton, Comp. Resources 503-641-8488
OR Hillsboro, Wyle 503-640-6000
OR Lake Oswego, Bell 503-241-4115
OR Portland, Newark 503-620-1614
OR Wilsonville, Shelley-Ragon 503-682-2929
PA Allentown, Newark 215-434-7171
PA Montgomeryville, Pyttronic 215-643-2850
PA Pittsburgh, CAM-RPC 412-782-3770
PA Pittsburgh, Newark 412-787-7740
PA Reading, Barbey 215-376-7451
RI Knoxville, Newark 615-588-6493
RI Warwick, Newark 401-738-4010
TN Nashville, Bell 615-367-4400
TX Austin, Wyle 512-834-9957
TX Dallas, Cypress 214-869-1435
TX Dallas, Newark 214-494-5911
TX Houston, Altair 713-462-3029
TX Houston, Newark 713-782-4800
TX Houston, Wyle 713-879-9953
TX McKinney, Prime 214-542-7915
TX Richardson, Altair 214-231-5166
TX Richardson, JACO 214-235-9575
TX Richardson, Wyle 214-235-9953
TX Stafford, Harrison Equip. 713-879-2660
TX Sugarland, Quality Comps. 713-491-2255

UT Salt Lake City, Bell 801-972-6969
UT Salt Lake City, Newark 801-484-8611
UT Salt Lake City, Wyle 801-974-9953
VA Arlington, Newark 703-522-0880
VA Charlottesville, Virginia Elec. 804-296-4184
WA Bellevue, Bell 206-747-1515
WA Bellevue, Newark 206-641-9800
WA Bellevue, Wyle 206-453-8300
WA Redmond, Shelley-Ragon 206-241-1980
WI Milwaukee, Indl. Elec. 414-276-1212
WI Milwaukee, Newark 414-463-1100
WI Oconomowoc, GW Elec. 414-567-9445
WI Waukesha, Bell 414-547-8879

EGIS CORPORATION, P. O. Box 751, Barrington, IL 60011-0751, Tel: 312-639-4448, TELEX: 650-336-1335 IMD, FAX: 312-639-8710; Empl.: 11

EH ELECTRONICS, INC., See Wavetek San Diego, Inc., Tel. 619-279-2200

EHRHORN TECHNOLOGICAL OPERS., INC., 4975 North 30th St., Colorado Springs, Colorado 80919, Tel: 719-260-1191, FAX: 719-260-0395; Empl.: 106; *Sls. Mgr.:* Rod Jensen; *Dist. Mgr.:* Rod Jensen

EI & S CORPORATION, 42 Pleasant St., Stoneham, MA 02180, Tel: 617-438-5300, FAX: 617-438-1662; FSC No.: 14908; Empl.: 100

FAX: 401-738-7154

EICHHOFF ELECTRONICS, 205 Hallene Rd., Warwick, RI 02886, Tel: 401-738-1440; Empl.: 280; *Sls. Mgr.:* David Leary ..... **A•1652-1655; B•1470-1471**

Local Sales Offices & Reps

CA Orange, E.T.A. 714-998-9241
CO Inglewood, Megatronics 303-799-3700
FL Tampa, Std. Mktg. Inc. 813-933-5833
FL W. Melbourne, Std. Mktg. Inc. 305-725-7073
IL Wheaton, Chadra-Schilke & Assocs. 312-653-8126
MI Livonia, Wenner & Assocs. 313-591-7955
MN Minneapolis, Electro-Serv Co. 612-338-3475
NH Nashua, Bell Controls, Inc. 613-882-6984
NY Liverpool, M.J. Sls. & Engrg. Inc.
NC Charlotte, W. L. Moorhead & Co. 704-366-2791
OH Mansfield, R. J. Goosman & Assocs. 419-756-5746
PA Washington Cross, Access Elctrns. 203-276-9303, 215-757-5504
TN Chattanooga, Stetco, Inc. 615-899-6831
UT Salt Lake City, Chuck Fields Assocs. 801-531-6177
UT Salt Lake City, Quorum 3 801-943-9227
Can Oakville, Ont., Haltronics Ltd. 416-844-2121

EIKONIX, 15 Wiggins Avenue, Bedford, MA 01730, Tel: 617-276-7161, TELEX: 951231, FAX: 617-276-5063; Empl.: 175; *Sls. Mgr.:* Jim LLoyd

EI MICROCIRCUITS, INC., 1650 Madison Ave., Mankato, MN 56001, Tel: 507-345-5786, FAX: 507-345-7559; Empl.: 40; *Sls. Mgr.:* Perry Eimers

EI NORTH AMERICA, 435 E. 79th St., New York, NY 10021, Tel: 212-517-5622, FAX: 212-517-5516

EIP MICROWAVE, INC., 2731 North First St., San Jose, CA 95134, Tel: 408-433-5900, TWX: 910-338-0155, FAX: 408-434-0258; FSC No.: 34257; Empl.: 100; *Sls. Mgr.:* Donn Mulder

EITEL MFG., 33208 Paseo Cerveza, Ste. G, San Juan Capistrano, CA 92675, Tel: 714-240-3933; Empl.: 6; *Sls. Mgr.:* H. Mengel

ELANTEC, INC., 1996 Tarob Ct., Milpitas, CA 95035, Tel: 408-945-1323, 800-821-7429, FAX: 408-945-9305; FSC No.: 64762; Empl.: 150; *Sls. Mgr.:* Ralph Granchelli

ELASTOMERIC TECHNOLOGIES, INC.

FAX: 215-672-4633

ELASTOMERIC TECHNOLOGIES, INC., 2940 Turnpike Dr., Hatboro, PA 19040, Tel: 215-672-0787, 215-672-4741, TWX: 387-236; FSC No.: 64914; *Sls. Mgr.:* John H. Seibert; *Dist. Mgr.:* George Glatts ..... **C•1344-1345**

Local Sales Offices & Reps

AL Huntsville, Remco 205-533-3763
AZ Scottsdale, TC Elctrn. Sls., Inc. 602-994-5153
CA Fullerton, Libratronix 714-871-1513
CA San Jose, Western Indl. Network 408-559-8118
CO Broomfield, Sunbird Inds., Inc. 303-460-9199
CO Denver, Sunbird Inds. 719-481-2900
CT S. Dartmouth, Remtron 508-996-5594
FL Casselberry, Southern Elctrns. Sls. 407-332-4718
FL Melbourne, Southern Elctrns. Sls. 407-242-9662
FL W. Palm Beach, Southern Elctrns. Sls. 407-790-4369
GA Atlanta, Remco 404-447-6937
IL Barrington, Fisk Mktg. 312-381-0653
IN Ft. Wayne, R. L. Bontempo & Assocs. 219-478-1057
KS Wichita, Baka Corp. 316-682-8411
MA Needham Hgts., Remtron 617-444-9566
MI Troy, C. B. Jensen & Assocs. 313-643-0506
MN Brooklyn Center, Willman Assocs. 612-566-5010
MO Creve Coeur, Baka Corp. 314-878-4224
NJ Madison, Livera-Polk Assocs., Inc. 201-377-3220
NY Glen Head, Livera-Polk Assocs., Inc. 516-759-9300
NC Raleigh, C-Tech Sls. Co. 919-782-8100
OH Cincinnati, G & H Sls. 513-272-0580
OH Cleveland, Arthur Baier Co. 216-461-6161
OR Beaverton, L. D. Elctrns. 503-684-8221
PA Hatboro, J. S. Wurts 215-674-3562
TX Houston, Marcom 713-271-5635
UT Salt Lake City, Sunbird Inds. 801-943-5609
WA Snohomish, L. D. Elctrns. 206-568-0511
WA Spokane, LD Elctrns. 509-922-4883

ELCO CORP., Electronic Connector Div., Huntingdon Ind'l. Park, Huntingdon, PA 16652, Tel: 814-643-0700, TWX: 510-691-3117; Empl.: 500; *Sls. Mgr.:* W. J. Graef; *Dist. Mgr.:* W. G. Solomon

ELCOM INDUSTRIES, INC., 10268 Bach Blvd., St. Louis, MO 63132, Tel: 314-429-3100, FAX: 314-429-9706; Empl.: 20; *Sls. Mgr.:* Thomas C. Noel

ELCOM SYSTEMS, INC., 932 Clint Moore Rd., Boca Raton, FL 33487, Tel: 305-994-1774, FAX: 407-994-1770; FSC No.: 32424; Empl.: 8; *Sls. Mgr.:* D. Pollachek ..... **A•1779**

Local Sales Offices & Reps

EXP MA, Mattapoisett, Clark Export-Import Co. 617-758-6448

ELCON PRODUCTS INTERNATIONAL COMPANY, 42700 Lawrence Place, Fremont, CA 94538, Tel: 415-490-4200, FAX: 415-490-3740; FSC No.: 85901; Empl.: 33; *Sls. Mgr.:* Shirlee Gendreau (inside Sls. Mgr.)

Local Sales Offices & Reps

CA La Miranda, Isys West 714-738-1582
CA San Jose, Isys, Inc. 408-259-0800
CT Danbury, Hathaway Elctrns. 203-790-6993
KS Kansas City, Bonner & Assocs. 816-756-0082
MA Lexington, Hathaway Elctrns. 617-861-7010
MN Minneapolis, Boerger & Assocs. 612-560-3435
MO Kansas City, Bonner & Assocs. 816-756-0082
NJ Basking Ridge, Churchill Assocs. 201-204-0744
OR Lake Oswego, RTS, Inc. 503-635-4927
TX Dallas, Dynamark Tech. Sls. 214-437-3333
WA Vashon, RTS, Inc. 206-285-1363
Can Mississauga, Ont., Patlon Aircraft & Inds. 416-624-5572

ELDEC CORP., Monitor & Control Div., 16700 13th Ave. W., P.O. Box 100, Lynnwood, WA 98046-0100, Tel: 206-743-1313, TELEX: 32-8959, TWX: 910-449-2855; Empl.: 1321

ELDEC CORP., Power Conversion Div., 16700 13th Ave. W., P.O. Box 100, Lynnwood, WA 98046-0100, Tel: 206-743-1313, TELEX: 497-0640, TWX: 910-449-2855; Empl.: 1400

ELDEC CORPORATION, Sensing Systems Div., 22000 Bothell Way-S.E., Bothell, WA 98041-3002, Tel: 206-487-4000, TELEX: 910-449-0873

ELDRE CORPORATION, 1500 Jefferson Rd., Rochester, NY 14623, Tel: 716-427-7280, TWX: 510-253-4347, FAX: 716-272-0018; FSC No.: 19648; Empl.: 220; *Sls. Mgr.:* James N. Fitzpatrick

ELECSYS,INC., Div. of C & C Jetronic, 320 Wall St., Princeton, NJ 08540, Tel: 609-921-2726, TELEX: 4971717, FAX: 609-921-7971; Empl.: 1; *Sls. Mgr.:* C. Jerry Chiang ..... **A•1739**

ELECTRAC, INC., 1614 Orangethrope Way, Anaheim, CA 92801, Tel: 714-879-6021, TELEX: 692433; FSC No.: 016154; Empl.: 35; *Sls. Mgr.:* Roland H. Wills

ELECTRA-TEC, Impert Industries, Inc., 557 W. M-89, Otsego, MI 49078, Tel: 800-225-3532, 616-694-2058, FAX: 616-694-2058; FSC No.: 4J966; Empl.: 20; *Sls. Mgr.:* William Robinson ..... **C•1026**

ELECTRICAL INDUSTRIES CORP., 691 Central Ave., Murray Hill, NJ 07974, Tel: 201-464-3200, FAX: 201-464-7619; FSC No.: 20093; Empl.: 300; *Sls. Mgr.:* D.V. Wilson

ELECTRICAL INSTRUMENT SERVICE, 25 Dock St., Mt. Vernon, NY 10550, Tel: 914-699-9717, FAX: 914-699-9410; FSC No.: 32590;16034A; Empl.: 35 ..... **D•1344-1345**

Local Sales Offices & Reps

AZ Scottsdale, Williams Assocs. 602-947-4297
CO Commerce City, Williams Assocs. 303-289-5647
DC Washington, Whitcomb Assocs. 202-737-0763
IL Lincolnwood, Saffro & Assocs. 312-677-9722
LA Metairie, Data Mktg. Assocs. 504-833-3655
MA Lexington, Zieco 617-861-8300
MI Southfield, Comtel Instrs. Co. 313-358-2505
MN Minneapolis, Hei-Lite Sls. 612-861-6051
NM Albuquerque, Williams Assocs. 505-255-1638
NY Mount Vernon, Elctrl. Instr. Svc. 914-699-9717
OH Cleveland, Comtel Instrs. Co. 216-442-8080
OH Dayton, Comtel Instrs. Co. 513-426-5310
OH Hilliard, Comtel Instrs. Co. 614-876-8305
OK Tulsa, Data Mktg. Assocs. 918-494-2711
PA Pittsburgh, Comtel Instrs. Co. 412-922-5720
TX Austin, Data Mktg. Assocs. 512-443-7722
TX Dallas, Data Mktg. Assocs. 214-661-0300
TX Houston, Data Mktg. Assocs. 713-954-5020
TX San Antonio, Data Mktg. Assocs. 512-342-3031
UT Salt Lake City, William-Assocs. 801-485-6511
WI Lake Mills, Saffro & Assocs. 1-800-327-0312
Can Beaconsfield, Que., Mesurina Ltee/Ltd. 514-697-6581

ELECTRICAL STANDARDS DIV., E.S.R.S., Inc., 7337 Greenbush, N. Hollywood, CA 91605, Tel: 818-765-4224; Empl.: 6

ELECTRICAL WINDINGS, INC., 2015 N. Kolmar Ave., Chicago, IL 60639, Tel: 312-235-3360; FSC No.: 72128; Empl.: 160; *Sls. Mgr.:* Donal R. Murphy

ELECTRIC DEVICE, PO Box 337, Canfield, OH 44406, Tel: 216-533-1111, FAX: 216-533-2639

ELECTRIC INDICATOR COMPANY INC., 272 Main Ave., Norwalk, CT 06851, Tel: 203-847-5861; FSC No.: 73693; Empl.: 60

ELECTRIC MOTOR ENGINEERING, 1847 Victory Blvd., Glendale, CA 91201, Tel: 818-502-1866, FAX: 818-520-1780; Empl.: 5; *Sls. Mgr.:* Jerry Kibler; *Dist. Mgr.:* Jerry Kibler

Distributor

ELECTRIC SWITCHES, INC., 2478 Fletcher Dr., Los Angeles, CA 90039, Tel: 213-660-1310, TWX: 910-321-2971; Empl.: 42; *Sls. Mgr.:* Louis Lim ..... **B•**1730-1731 619, 621, 625, 639, 643, 645, 646, 666, 672, 684, 697, 711, 718, 720, 726, 731, 738, 744, 753, 757, 763, 781, 795, 799

ELECTRIC TACHOMETER, 68th & Upland Sts., Philadelphia, PA 19142, Tel: 215-726-7723, TELEX: 83-1475, FAX: 215-724-3682; FSC No.: 20049; Empl.: 50; *Sls. Mgr.:* F. M. Porter

Local Sales Offices & Reps

AL Huntsville, VESCO 205-881-1494
CA Belmont, TechSci. Intl, Inc. 415-592-6300
IL Hinsdale, Johnson Engrg. & Sls. Co. 312-325-2272
NY Pittsford, Holter Assocs. 716-381-7988
NY Valley Stream, Idalee Elctrns. Corp. 516-825-8955
NC Greensboro, Associated Agents 919-292-6508
OH Cincinnati, Kammerer Sls. Co. 513-271-0131
OH Cleveland, Fred R. Sharp Co. 216-464-3820
PA Pittsburgh, Technovation Assocs., Inc. 412-366-4760
TX Stafford, Jordan Equip. Co. 713-498-6212

ELECTRIC TIME COMPANY, INC., P.O. Box 466, Medfield, MA 02052, Tel: 617-359-4396, FAX: 617-359-4482; FSC No.: 6645; Empl.: 10

ELECTRO ASSEMBLIES CORP., 425 Huehl Rd., Bldg. 17, Northbrook, IL 60062, Tel: 312-498-6520, FAX: 312-272-2915; FSC No.: 09250; Empl.: 60; *Sls. Mgr.:* Greg Andrews

ELECTROCHEM INDUSTRIES

FAX: 716-759-7390

ELECTROCHEM INDUSTRIES, Wilson Greatbatch Ltd., 10000 Wehrle, Clarence, NY 14031, Tel: 716-759-7320, TELEX: 137-084; FSC No.: 6U589; Empl.: 900; *Dist. Mgr.:* P. Baker ..... **D•1489**

Local Sales Offices & Reps

CA	Garden Grove, Elsco Elctrns., Inc.	714-891-4621
CA	San Diego, Elsco Elctrns., Inc.	619-292-1771
IN	Indianapolis, STB & Assocs., Inc.	317-844-9227
MA	Waltham, Del Tech Sls.	617-894-4550
NJ	Medford, Champion Elctrn. Sls., Inc.	609-983-0932
OH	Beachwood, Electronic Salesmasters	216-831-8647

Local Distributors

AZ	Phoenix, Lynntronics	602-433-0288
AZ	Scottsdale, Electro Mktg.	602-991-0110
CA	Long bch., Battery Specialties	213-437-1809
CA	San Diego, Tauber Elctrns.	619-274-7242
CA	San Jose, Battery Specialties	408-554-1501
CA	San Jose, Rose Elctrns.	408-943-0200
CO	Englewood, AVT, Inc.	303-779-8056
CO	Englewood, Shelley-Ragon, Inc.	303-762-0670
IL	Downers Grove, TDI, Inc.	312-971-3460
MA	Sharon, Adcour, Inc.	617-784-8123
MI	Ann Arbor, Wedemeyer Elctrns. Supp. Co.	313-665-8611
MN	St. Paul, Shelley-Ragon, Inc.	612-642-2858
NJ	Clifton, Engrd. Assemblies Corp.	201-340-0600
NC	Raleigh, Engrd. Assemblies Corp.	919-790-9700
PA	McKean, Advacom, Inc.	814-476-7774
TX	Houston, Kent/K. Tec	713-954-8407
WA	Redmond, Priebe Elctrns.	206-881-2363
Can	Calgary, Alberta, Saynor Varah Inc.	403-255-9550
Can	Don Mills, Ont., Saynor Varah Inc.	416-445-2340
Can	Edmonton, Alberta, Saynor Varah Inc.	403-461-2222
Can	Quebec, Saynor-Varah	514-630-7470
Can	Vancouver, BC, Saynor Varah Inc.	604-273-2911

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Can Victoria, BC, Pacific Coast Elctrns. Ltd. 604-385-5111

ELECTROCOM INDUSTRIES, 1105 N. Ironwood Dr., S. Bend, IN 46615, Tel: 219-232-2743; FSC No.: 27114; *Sls. Mgr.:* B. Jaffe

ELECTRO CORPORATION, Sub. of Fasco Industries Inc., 1845 57th Street, P.O. Box 3049, Sarasota, FL 34230-3049, Tel: 813-355-8411, TELEX: 52683, FAX: 813-355-3120; FSC No.: 81692; Empl.: 300; *Sls. Mgr.:* Steve Anderson; *Dist. Mgr.:* Ron Essig

ELECTROCUBE, 1710 So. Del Mar Ave., San Gabriel, CA 91776, Tel: 818-573-3300, FAX: 818-280-9259; FSC No.: 14752; Empl.: 175; *Sls. Mgr.:* Gene Williams; *Dist. Mgr.:* Gene Williams

ELECTRODATA, INC., 23020 Miles Rd., Bedford Heights, OH 44128, Tel: 216-663-3333, TWX: 810-427-2280, FAX: 216-663-0507; FSC No.: 34-1173465; Empl.: 15; *Sls. Mgr.:* Philip Ardire; *Dist. Mgr.:* Philip Ardire

ELECTRODYNAMICS

FAX: 312-255-3827

ELECTRODYNAMICS, INC., A Talley Inds. Co., 1200 Hicks Rd., Rolling Meadows, IL 60008, Tel: 312-259-0740, TELEX: 28-1070; FSC No.: 10236; Empl.: 250; *Sls. Mgr.:* Frank Rafferty ..... **D•1145**

Local Sales Offices & Reps

CA	Alhambra, M. W. Riedel & Co.	213-283-7694
CA	Hayward, Liaison, Inc.	415-783-1131
CO	Denver, West High-Tech, JV	303-477-8180
CT	Old Saybrook, FJS Assocs.	203-388-5374
IA	Cedar Rapids, J.R. Sales Engrg.	319-393-2232
MD	Severna Park, Delmarva Engrg. Assocs., Ltd.	301-647-8007
MA	Burlington, FJS Assocs.	617-273-5959
MN	Minneapolis, TWC Sls.	612-636-1770
MO	St. Louis, Midwest Meridian Corp.	314-878-4441
NJ	Basking Ridge, Churchill Assocs.	201-204-0744
NY	Larchmont, Hingston Walsh Assocs., Inc.	914-834-5781
NY	Pittsford, Noeth Honsinger Assocs.	716-586-9002
OR	Tigard, ElTech, Inc.	503-684-3458
PA	Norristown, Rivco January Inc.	215-631-1414
TX	Roanoke, CMR	817-379-6540
WA	Bellevue, ElTech, Inc.	206-643-4330

ELECTRO-DYNAMICS DEV. CO., 475 Mt. Hood Dr. S.W., Issaquah, WA 98027-4038, Tel: 206-392-2493; FSC No.: 9J838; *Sls. Mgr.:* W. A. Pommer

ELECTROFILM, 27727 Avenue Scott, P.O. Box 55669, Valencia, CA 91355, Tel: 805-257-2240, TELEX: 65-1438; FSC No.: 85932; Empl.: 95; *Sls. Mgr.:* Richard W. Pearson

ELECTRO-FILMS

FAX: 401-738-4389

ELECTRO-FILMS, INC., 111 Gilbane St., Warwick Central Indl. Pk., Warwick, RI 02886, Tel: 401-738-9150, TWX: 710-382-0405; FSC No.: 57252; Empl.: 260; *Sls. Mgr.:* Ted Petit, Corp. Sls. Dir. ..... **A•1781, 1944-1946**

Local Sales Offices & Reps

AL	Huntsville, BCI, Inc.	205-539-4411
CA	San Jose, NES Assocs.	408-293-2600
CA	Santa Ana, Weatherman Assocs.	714-544-1304
CA	Sunnyvale, NES Assocs.	408-738-3259
CO	Ft. Collins, Rep Sls.	303-226-1504
FL	St. Petersburg, QXI	813-894-4556
GA	Chamblee, BCI, Inc.	404-455-0405
IL	Palatine, M & S Sls.	312-934-1200
IN	Ft. Wayne, Corrao Marsh	219-482-2725
MA	Bedford, Vector Assocs.	617-271-0000
MA	Bedford, Vector Assocs.	617-275-5358
MI	Livonia, Electro Sls. Assocs.	313-421-7500
MN	Minneapolis, PSA	612-835-5281
NM	Albuquerque, Western High Tech. Mktg.	505-884-2256
NY	Plainview, Robert Smith Assocs.	516-681-3155
NY	Syracuse, Labtronics	315-455-7314
NJ	Whippany, Robert Smith Assocs.	201-340-0204
NC	Charlotte, BCI, Inc.	704-545-7657
NC	Winston-Salem, Comp. Concepts	919-765-3484
OH	Chesterland, Electro Sls. Assocs.	216-729-0190
OH	Dayton, Electro Sls. Assocs.	513-426-5551
OR	Aloha, Demarest Assocs., Inc.	503-642-4515
PA	Exton, Linear Sls.	215-524-8080
PA	Pittsburgh, Electro Sls. Assocs.	412-322-9000
PA	Trevose, PSA Inc.	215-245-0513
TX	Missouri City, Jackson Arnold Assocs.	713-261-0798
VA	Oakton, PSA, South	703-281-1806
WA	Seattle, Demarest Assocs.	206-523-3210
Can	Montreal, Que., Solid State Engr. Co.	514-481-3313

ELECTRO FORCE CORP., 727 Oakstone Way, Anaheim, CA 92806, Tel: 714-774-3666

ELECTROHOME LIMITED, Circuit Board Operations, 809 Wellington St. N., Kitchener, Ontario, Canada N2G 4J6, Tel: 519-744-7111, TELEX: 069-55449, FAX: 519-749-3131; Empl.: 2000; *Sls. Mgr.:* Joe Moser

Electro IMPULSE, INC.

FAX: 201-747-7153

ELECTRO IMPULSE, Box 870, Red Bank, NJ 07701-0870, Tel: 201-741-0404, TWX: 710-722-5717 EILRENK; FSC No.: 91161; Empl.: 105; *Sls. Mgr.:* Mark Rubin ..... **C•1652-1653; D•1243**

Local Sales Offices & Reps

CA	Los Angeles, RDH Assocs.	213-396-4100
FL	Indian Harbour Beach, Southeastern Comp. Sls., Inc.	407-773-3767
GA	Atlanta, Southeastern Comp. Sls., Inc.	404-451-5353
KS	Overland Park, WEB Assocs./Elctrns., Inc.	913-381-7986
MD	Ellicott City, Saltech	301-461-7350,
MA	Reading, Geder Assocs.	617-944-3105
MO	Florissant, WEB Assocs./Elctrns.	314-921-5720
NY	Plainview, B. D. Aaron & Co.	516-349-7399
TX	Richardson, Scientific Dvcs. Southwest	214-231-8106
WA	Seattle, Delcom Sls. Co., Inc.	206-248-0090

ELECTRO INDUSTRIES, Div. E.I. Elctrns., Inc., 1800 Shames Drive, Westbury, NY 11590, Tel: 516-334-0870, TELEX: 4948652 ELECTRO, FAX: 516-338-4741; Empl.: 20; *Sls. Mgr.:* S. Kagan ..... **D•1389**

For further information call toll free: 800-645-6342

ELEC-TROL, INC., 26477 N. Golden Valley Rd., Saugus, CA 91350, Tel: 805-252-8330, TELEX: 310-3720 331, FAX: 805-251-7147; FSC No.: 15636; Empl.: 650; *Sls. Mgr.:* Mark Smith

ELECTROL CO., 321 Dewey St., P.O. Box 29, York, PA 17405, Tel: 717-848-1722, FAX: 717-848-4514; Empl.: 30; *Sls. Mgr.:* Debra Dudley; *Dist. Mgr.:* Debra Dudley

ELECTROLOGIC, INC., 1359 28th St., Signal Hill, CA 90806, Tel: 213-595-0551, FAX: 213-595-0554; Empl.: 10; *Sls. Mgr.:* Tony Hudson

ELECTRO-MAGENTIC PROCESSES, INC.:MEMBER OF ISC DEFENSE & SPACE, 9616 Owensmouth Ave., Chatsworth, CA 91311-4858, Tel: 818-882-6333, TELEX: 499 2240 EMP UI; FSC No.: 51290; Empl.: 100; *Sls. Mgr.:* Kenneth A. Hacker, VP Sls.

ELECTROMATIC CONTROLS CORP., 2495 Pembroke Road, Hoffman Estates, IL 60195-2010, Tel: 312-882-5757, TWX: 910-222-3452; FSC No.: 75203; Empl.: 400; *Sls. Mgr.:* Paul Capiello; *Dist. Mgr.:* Mike Meurer

ELECTROMECH, INC., 528 Elm Street, Kearny, NJ 07032, Tel: 201-997-0950, FAX: 201-997-9208; Empl.: 40; *Sls. Mgr.:* Solomon Ezra ..... **A•2280-2281; D•1737**

Local Sales Offices & Reps

NJ	Kearny, Electromech, Inc.	201-997-0950

ELECTRO MECHANICAL SYSTEMS, INC., 801 W. Bradley Ave., Champaign, IL 61820, Tel: 217-359-7125, FAX: 217-359-2075; Empl.: 20; *Sls. Mgr.:* Julie L. Redman

ELECTRO-MECHANISMS, INC., 2745 E. Huntington Dr., Duarte, CA 91010, Tel: 818-359-2535, FAX: 818-303-2189; FSC No.: 52592; Empl.: 27 ..... **B•1662-1663**

Local Sales Offices & Reps

CA	San Carlos, Hickey Indl. Sls.	415-594-9978
OH	Dayton, Harvey Teplitz	513-898-5282

ELECTRO-MECH CO., 707 Hathaway Dr., Colorado Springs, CO 80915, Tel: 719-597-1620, FAX: 719-597-1628; *Sls. Mgr.:* Eastern: Frank Pareso, Western: Michael Hagen

ELECTRO-MECH COMPONENTS, INC., 1826 N. Floradale Ave., South El Monte, CA 91733-3689, Tel: 818-442-7180, TWX: 510-601-8764, FAX: 818-350-8070; FSC No.: 07150; Empl.: 25; *Sls. Mgr.:* T. Trumbull; *Dist. Mgr.:* Terry Trumbull ..... **B•1728-1729**

Local Sales Offices & Reps

CA	Irvine, Vale Elctrn. Assoc.	714-551-4004
CA	San Diego, Qualtronics	619-695-0118
CA	Santa Clara, Engrg. Assocs.	408-988-5001
CO	Englewood, Franklin Sls.	303-789-2526
CT	Milford, Todino Engrg.	203-874-6643
FL	Orlando, Publicover	305-898-9361
IL	Chicago, IRI	312-967-8430
MD	Baltimore, Callas Elctrns., Inc.	301-744-7711
MA	Needham Hgts., Todino Engrg.	617-444-7925
MI	Plymouth, Leading Edge Sls.	313-420-3344
MN	Minneapolis, D. A. Case Assocs.	612-869-3700
NJ	Medford, Comp. Consits.	609-654-5300
NY	Mamaroneck, Bassin Tech.	914-698-9332
NY	Orchard Pk., SHR	716-662-0555
OH	Cincinnati, KCH Co.	513-931-1686
OR	Forest Grove, Doran Sls.	503-357-3333
TX	Leander, McCoy Assocs.	512-259-1109
TX	Richardson, McCoy Assocs.	214-238-1017
WA	Redmond, Doran Sls.	206-885-1885
WI	Milwaukee, IRI	414-259-0965

Local Distributors

AZ	Phoenix, Parts Elctrn.	602-258-6476
CA	Los Angeles, Elec. Switches	213-660-1310
CA	Los Angeles, Master Distrs.	213-452-1229
CA	Redwood City, SLD, Inc.	415-364-9881
NY	Buffalo, Industrial Elctrns.	716-873-9661
NY	Mamaroneck, Logicomp Elctrns.	800-431-2625

ELECTRO-METRICS, Penril Corp., 100 Church St., Amsterdam, NY 12010, Tel: 518-843-2600, TWX: 710-446-4798, FAX: 518-843-2812; FSC No.: 18581; Empl.: 105; *Sls. Mgr.:* James Labenz

ELECTRONIC COMPONENTS GROUPE

FAX: 612-375-1905

ELECTRONIC COMPONENTS GROUPE, Stein Industries, Inc., 26 North 5th Street, Minneapolis, MN 55403, Tel: 612-375-9639, 800-826-8719, TELEX: 62985650, TWX: 910-240-7878 (Overseas); *Sls. Mgr.:* Rick Hampton; *Dist. Mgr.:* Rick Hampton ..... **B•1733-1735**

Local Sales Offices & Reps

AL	Huntsville, Cartwright & Bean	205-830-1540
CA	Cupertino, F & F Assocs.	408-446-2349
CA	Irvine, Groh Assocs.	714-837-9871
CA	San Diego, Groh Assocs.	619-453-7572
CO	Denver, West Inc.	303-477-8180
FL	Margate, EPM Corp.	305-977-0331
FL	Orlando, EPM Corp.	305-977-0331
GA	Atlanta, Cartwright & Bean, Inc.;GA Div.	404-368-0160
GA	Norcross, Cartwright & Bean, Inc./GA Div.	404-368-0160
IL	Downers Grove, Richmar Elec.	312-968-0118
IN	Indianapolis, Richmar Elctrns.	317-577-9950
KS	Overland Pk., Electri-Rep	913-649-2168
LA	Covington, Cartwright & Bean, Inc.	504-892-1780
MI	Ypsilanti, Tech Rep	313-572-1950
MN	New Brighton, Complete Sls.	612-731-2923
MN	Oakdale, Complete Sls.	612-731-2923
MS	Jackson, Cartwright & Bean, Inc.	601-981-1170
MO	St. Louis, Electri-Rep	314-993-4421
NH	Londonderry, Bennetron	603-432-9092
NJ	Mtn. Lakes, Comps. Technlg.	201-334-2921
NM	Albequerque, Syntech	505-266-7951
NY	Islip, ABS Technlgs.	516-277-7101
NY	Rochester, Tech. Comp. Sls.	716-342-2406
NC	Charlotte, Cartwright & Bean, Inc.	704-536-0303
NC	Raleigh, Cartwright & Bean, Inc.	919-876-4130
OH	Centerville, Components Inc.	513-436-0255
OH	Cleveland, Components, Inc.	216-243-9200
OR	Portland, Elctrn. Engrg. Sls.	503-639-3978
PA	West Chester, TCA Assocs., Inc.	215-692-6853
TN	Knoxville, Cartwright & Bean	605-693-7450
TN	Memphis, Cartwright & Bean, Inc.	901-362-8345
TX	Dallas, Rem Air Comps. Corp.	214-234-1069
VA	Richmond, Glassock Assoc.	804-740-0063
WA	Redmond, Elctrn. Engrg. Sls.	206-883-3374
WI	Butler, Richmar Elctrns.	414-781-1730

Local Distributors

AL	Huntsville, C.D.I.	205-883-7501
AR	Little Rock, C.D.I.	501-227-6278
CA	Hollywood, Yale Elec.	213-465-3186
CA	Manhattan Beach, Prime Electro	213-379-3642
CA	San Carlos, Logan Elec.	415-594-0700
CA	San Diego, Sigma Elctrns.	619-565-7000
CA	Santa Ana, El-Com, Inc.	714-432-6630
CA	Santa Monica, Master Distrs.	213-452-1229
CA	Sunnyvale, Target Elctrns.	408-734-5611
CA	Van Nuys, Wes-Garde Comps.	213-873-4802
CO	Englewood, Industrial Elctrns.	303-694-9444
CT	Hartford, Wes-Garde Comps.	203-527-7705
CT	Waterbury, Century Elec. Supp.	203-755-0405
FL	Ft. Lauderdale, KSM Elctrns.	305-971-5900
FL	Lakeland, Wes-Garde Comps.	813-644-7564
FL	Melbourne, C.D.I.	305-724-9910
GA	Atlanta, KSM Elctrns.	404-458-2013
GA	Norcross, C.D.I.	404-441-3320
IL	Carol Stream, Wes-Garde Comps.	312-653-1460
IA	Cedar Rapids, Dee Elctrns.	319-365-7551
KS	Wichita, Radio Inc.	316-264-2798
MD	Beltsville, PSI	301-937-4960
MD	Columbia, D. K. Elctrns.	301-995-1950
MA	Holliston, Add Elctrns. ..	800-541-7400,800-343-4933
MA	Newton, Greene-Shaw Co.	617-969-8900
MN	New Brighton, Chris Elctrns.	612-631-2647
MO	Florrissant, Delltron Co., Inc.	314-839-0033
MO	St. Louis, Wes-Garde Comps.	314-567-7776
NH	Nashua, Wes-Garde Comps.	603-880-1971
NJ	Mt. Laurel, Wes-Garde Comps.	609-778-8190
NJ	W. Berlin, G.C.I.	609-768-6767
NY	E. Syracuse, Add Elctrns.	315-437-0300
NY	Victor, Add Elctrns. Corp.	716-924-4400
NC	Raleigh, C.D.I.	919-834-9465
OH	Westerville, Wes-Garde Comps.	614-885-0319
OH	Youngston, Add Elctrns.	216-792-6900
OK	Oklahoma City, Radio Inc.	405-789-0741
OK	Tulsa, Radio Inc.	918-587-9123
OR	Beaverton, Comp. Resources	503-641-8488
OR	Portland, Radar Elec.	503-232-3404
TX	Dallas, C.D.I.	214-644-0373
TX	Dallas, Off-the-Shelf Comps.	214-247-0052
TX	Dallas, Wes-Garde Comps.	214-357-1768
TX	Richardson, Off-the-Shelf Comps.	214-238-0808
WA	Kent, Comp. Resources	206-454-8666
WA	Seattle, Radar Elec. Co., Inc.	206-282-2511
WA	Spokane, Radar Elec.	509-747-3053

FAX: 201-542-0524

ELECTRONIC CONCEPTS, INC., Box 1278, Eatontown, NJ 07724, Tel: 201-542-7880, TELEX: 7107226661; FSC No.: 50558; Empl.: 240; *Sls. Mgr.:* Philip N. Lepore ..... **A•1070-1075**

Local Sales Offices & Reps

AZ	Tempe, Piper Sls. Co.	602-949-0048
CA	La Mirada, Select Elctrns.	714-739-8891
IL	Wheaton, Elctrn. Concepts, Inc.	312-668-8747
MN	Minneapolis, Components Grp.	612-374-1250
MO	Grandview, Harris-Hanson Co.	816-763-6200
NJ	Eatontown, Elctrn. Concepts, Inc.	201-542-7880
NM	Albuquerque, Piper Sls. Co.	505-883-9090
MO	St. Louis, Harris-Hanson Co.	314-432-3611
TX	Richardson, Milred Assocs., Inc.	214-644-6731

Local Distributors

NJ	Clifton, Elcon Sls.	201-546-5022

ELECTRONIC CONTROLS, INC., 431 Park Industrial Dr., La Habra, CA 90631, Tel: 213-697-4189; Empl.: 9

ELECTRONIC CONTROLS DESIGN, 13626 S. Freeman Rd., Mulino, OR 97042, Tel: 503-829-9108, TELEX: 703874 ECDINC UD, FAX: 503-829-4113; Empl.: 120; *Sls. Mgr.:* Steven Glass

ELECTRONIC DEVELOPMENT ASSOCIATED, INC., 1 Westcliff Drive, Dix Hills, New York 11746, Tel: 516-673-3881, FAX: 516-673-5979; FSC No.: 9V841

FAX: 617-268-6754

ELECTRONIC DEVELOPMENT CORP., EDC, 11 Hamlin St., Boston, MA 02127-4198, Tel: 617-268-9696, TELEX: 951596; FSC No.: 12619; *Sls. Mgr.:* R. B. Ross ..... **D•1244-1245**

Local Sales Offices & Reps

AL	Huntsville, MOCO	205-881-5968
AZ	Tempe, Mesa Technlg.	602-279-5243
CA	Canoga Park, F.L.W.	818-989-5238
CA	Carlsbad, F.L.W. Inc.	619-434-5251
CA	Carlsbad, FLW, Inc.	619-434-5251
CA	Costa Mesa, FLW, Inc.	714-751-7512
CA	Fremont, F.L.W.	415-651-6511
CO	Englewood, R. A. Mayes Co.	303-761-9447
FL	Orlando, Gentry Assocs.	305-859-7450
FL	Tampa, Gentry Assocs.	813-886-0720
IL	Hoffman Estates, Carvel Engrg.	312-885-8800
IN	Carmel, Berndt Assocs.	317-844-0114
KS	Lenexa, Ramsey Assts.	913-541-1007
KS	Overland Park, Ramsey Assocs.	913-541-1007
MA	Needham, Addelco Corp.	617-444-4754
MI	Hazel Park, Tiby Co.	313-547-3550
MN	Edina, Carvel Engrg. & Sls.	612-835-7929
MO	St. Louis, Ramsey Assocs.	314-878-5042
NJ	Union, Friedman Assocs.	201-964-6200
NM	Albuquerque, Mesa Technlg.	505-292-2330
NY	Henrietta, Ossmann Instrs.	716-359-3801
NC	Raleigh, Lee Assocs.	919-848-8818
OH	Cleveland, Tiby Co.	216-371-5335
OH	Dayton, Tiby Co.	513-277-3822
OR	Portland, Topp Engrg. Sls.	503-244-7265
PA	Willow Grove, Rhodes Technlg.	215-657-0330
TX	Dallas, Tech Rep Mktg.	214-241-2434
TX	Farmers Branch, Tech Rep Mktg.	214-241-2434
TX	Kemah, Hi Tech Sys.	713-783-3856
WA	Bellevue, Topp Engrg. Sls.	206-747-5400
WI	Sheboygan, Carvel Engrg.	414-457-8800

ELECTRONIC DEVELOPMENT LABS., See EDL Inc.

ELECTRONIC DEVICES, INC., 21 Gray Oaks Ave., Yonkers, NY 10710, Tel: 914-965-4400, FAX: 914-965-5531; Empl.: 200; *Sls. Mgr.:* Paul Dengler; *Dist. Mgr.:* Paul Dengler ..... **A•2178-2179**

Local Sales Offices & Reps

AZ	Tempe, Cantec Sls.	602-345-1276
CA	San Jose, Nelson Elctrn. Sls., Inc.	408-293-2600
CO	Golden, Dossett Elctrn. Mktg. Inc.	303-278-4620
FL	Melbourne, Kennedy Assocs.	407-676-6875
IN	Carmel, Berndt Assocs.	317-844-0114
MA	Sharon, Cummings Assocs.	617-784-5600
MI	Grand Blanc, Inter-Comm, inc.	313-695-0665
MN	Brooklyn Ctr., P Lydon	612-535-6526
MO	St. Louis, Rep-tronics Inc.	314-576-9816
NY	Buffalo, Promark Elctrns.	716-877-3300
NY	Patchogue, Optimum Sls. Co.	516-758-0644
NC	Raleigh, B.T. Funderburk Inc.	919-846-2373
OR	Portland, IVC Inds. Vehicle Corp.	503-297-3364
PA	Pipersville, Yax Assocs.	215-776-2100
PA	Waterford, Bacon Elec. Sls.	814-796-2381
TX	Dallas, Kruvand Assocs. Inc.	214-437-3355
WI	Mequon, Stumm Sls.	414-241-8414
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Local Distributors

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WI Broodfield, Control Sys. 414-797-9500

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FL Lighthouse Point, Jack Krutek & Assocs. 305-427-4202
GA Atlanta, L & D Inc. 404-395-7079
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FL Deerfield Bch., Delmac Sls. 305-427-7788
FL Longwood, Delmac Sls. 305-831-0040
GA Duluth, Dixie Tech. Mktg. 404-381-5592
IL Rolling Meadows, Eagle Tech. Sls. 312-991-0700
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FAX: 714-250-0958

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PA Philadelphia, FLW of PA, Inc. 215-251-9700
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ELECTRO-OPTICAL INDUSTRIES, Box 3770, Santa Barbara, CA 93130, Tel: 805-964-6701 (ext. 280), TELEX: 65-8427 EOIND SNC, FAX: 805-967-8590; Empl.: 130

ELECTRO-PACIFIC, 5770 Thornwood Dr., Goleta, CA 93117, Tel: 805-964-0751; FSC No.: 29853; Empl.: 60; *Sls. Mgr.:* T. Calhoun

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ELECTRO RENT CORP., 6060 Sepulveda Blvd., Van Nuys, CA 91411, Tel: 818-727-2100, FAX: 818-786-4224; Empl.: 500; *Sls. Mgr.:* Walt Kosmowski

ELECTRO-SCIENCE LABS., INC., 416 E. Church Rd., Po Box 1533, King of Prussia, PA 19406-1533, Tel: 215-272-8000, TELEX: 83-4788, FAX: 215-272-6759; Empl.: 120

ELECTRO SCIENTIFIC INDUSTRIES, INC. (ESI), 13900 N.W. Science Pk. Dr., Portland, OR 97229, Tel: 503-641-4141, TELEX: 474-2064; FSC No.: 11837; Empl.: 800; *Sls. Mgr.:* Dick Donaca, Sys./Gay Gasque-Instruments

FAX: 215-682-2133

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CA Irvine, Vale Assocs. 714-551-4004, 4821
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MD Upperco, Imagitron Sls. Co. 800-638-3592
MA Waltham, Betronic Assocs. 617-894-8400
NJ Boonton, Winter Assocs. 201-334-3434
NY Morrisville, Promark Elctrns., Inc. 315-662-3310
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TX Dallas, Blair Engrg. 214-241-5655
WA Redmond, Electronics Northwest, Inc. 206-883-1959
WA Spokane, Electronic Northwest, Inc. ... 509-924-0450

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NJ Frenchtown, SINTEC 201-996-4093
NY Baldwin, Accessories for Elctrns. 516-546-1751

ELECTROSPACE SYSTEMS, INC., P. O. Box 831359, Richardson, TX 75083-1359, Tel: 214-470-2106/2107, TWX: 910-867-4768; FSC No.: 33875; Empl.: 1712

ELECTRO STANDARDS LAB., INC., P.O. Box 9144, Providence, RI 02940, Tel: 401-943-1164, FAX: 401-946-5790; Empl.: 25; *Sls. Mgr.:* R. B. Sepe; *Dist. Mgr.:* R. B. Sepe

ELECTROSTATICS, 7718 Clairemont Mesa Blvd., San Diego, CA 92111, Tel: 619-279-1414, FAX: 619-279-1126; FSC No.: 34538; Empl.: 10

ELECTRO-SUPPORT SYSTEMS, 28060 Del Rio Rd., Temecula, CA 92390, Tel: 714-676-2751; FSC No.: 66760; Empl.: 37; *Sls. Mgr.:* Don Pretot

ELECTROSWITCH, Unit of Electro Switch Corp., 180 King Ave., Weymouth, MA 02188, Tel: 617-335-5200, FAX: 617-335-4253; FSC No.: 82121; Empl.: 290; *Sls. Mgr.:* W. M. Mello ..... **B•1736**

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CA Los Angeles, Wiley 213-666-1611
CA San Diego, Wiley Co. 619-453-9018
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CO Boulder, Comp. Prods. Sls. 303-530-2800
FL Apopka, Floritronics 305-886-4818
FL Ft. Lauderdale, Peerless Radio Corp. 305-973-4141
GA Atlanta, Georgia Control Ctr. 404-876-8833
GA Atlanta, Holman-Gillespie 404-992-8820
IL Bridgeview, MIDCO Comp. Sls., Inc. ... 312-599-7777
IL Elk Grove Village, Electroswitch 312-593-2225
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MD Kensington, Marine Air Supp. 301-949-9560
MI Royal Oak, Hilltronics 313-435-0920
MN St. Paul, K.D.I. 612-645-7717
MN St. Paul, Kencotronics 612-645-7717
MO Chesterfield, Weisler & Assocs. 314-394-4543
MO Kansas City, Weisler & Assocs. 816-421-1703
NJ Fairfield, Electroswitch 201-227-6559
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NY Hempstead, Electronec Equip. Co., LTD. 516-538-5510
NY Rochester, Upstate Engrg. Sls. 716-227-4388
NY Utica, Upstate Engrg. Sls. 315-797-6721
NC Raleigh, Wholesale Elec. Supp. Co. ... 919-878-9400
NC Winston-Salem, L.G. White Southern .. 919-725-3612
OH Franklin, Rockford Controls 513-743-8066
OH Medina, Rockford Controls 216-725-3705
OH Medina, Rockford Controls OH, Inc. ... 216-725-3705
PA Pittsburgh, R. F. Clark 412-242-9500
SC Greenville, L.G. White Southern 803-271-0630
TX Dallas, Brice Co. 214-233-9808
TX Stafford, Barclay Wholesale Div. 713-240-1788
TX Stafford, Brice Co. 713-240-1788
VA Ashland, L.G. White Southern 804-752-7055
WA Kent, C.B. Parsons & Co. 206-762-7373
WA Kent, C.B. Parsons Co. 206-762-7373
WI Wauwatosa, Larsen Assocs. 414-258-0529

Local Distributors

CA Los Angeles, Electric Switches 213-660-1310
FL Ft. Lauderdale, Peerless Radio Corp. of Fla. 305-973-4141
GA Atlanta, Georgia Control Ctr. 404-876-8833
IL Bridgeview, Midco Comp. Sls. 312-599-7777
MD Kensington, Marine Air Supp. 301-949-9560
MN St. Paul, K. D. I. 612-645-7717
NY Hempstead, Electronic Equip. Co. 516-538-5510
NC Raleigh, Wholesale Elctrns. 919-878-9400
OH Medina, Rockford Controls Ohio 216-725-3705
TX Stafford, Barclay Whls. 713-240-1788
WA Seattle, C.B. Parsons Co. 206-762-7373

ELECTROSWITCH, SOUTHERN DIV., Electro Switch Corp., 2510 North Blvd., Raleigh, NC 27604, Tel: 919-833-0707, FAX: 919-833-8016; Empl.: 70; *Sls. Mgr.:* Steven M. Smith; *Dist. Mgr.:* Lisa C. Tillis ..... **B•1737**

Local Sales Offices & Reps

AL Huntsville, R. W. Mitscher Co., Inc. 205-882-6050
CA Campbell, Luscombe Engrg. Co. of S.F. 408-370-2020
CA Irvine, Vale Elctrns. 714-551-4004
CA San Diego, Vale Elctrns. 619-693-0113
FL Clearwater, Electrocraft, Inc. 813-578-2233
GA Lawrenceville, R. W. Mitscher Co. 404-923-3239
IL Itasca, Janus, Inc. 312-250-9650
IN Indianapolis, C.C. Electro Sls. 317-255-1508
KS Overland Pk., Electri Rep., Inc. 913-649-2168
MD Laurel, R. W. Mitscher Co., Inc. 301-498-6090
MI Canton, C.C. Electro Sls. 313-338-7400
MN Minneapolis, HMR, Inc. 612-888-2122
MO St. Louis, Electri Rep., Inc. 314-993-4421
NH Salem, Sls. Engrg. Co. 603-893-5521
NJ Collingswood, R.W. Mitscher Co. 609-854-7852
NJ Englewood, Sprung/Nussbaum, Inc. .. 201-569-5666
NY Clarence, R. W. Mitscher Co., Inc. 716-759-2350

NC Raleigh, R. W. Mitscher Co., Inc. 919-848-0941
OH Twinsburg, C.C. Electro Sls. 216-425-8338
OR Beaverton, Luscombe Engrg. Co. 503-636-6664
TN Johnson City, R. W. Mitscher Co., Inc. 615-929-7258
TX Austin, Allied Comps., Inc. 512-331-4494
TX Dallas, Allied Comps., Inc. 214-238-0408
VA Shipman, R. W. Mitscher Co., Inc. 804-263-5154
WI Hartland, Selective Sls. Co. 414-367-1133
Can Mississauga, Ont., Gidden-Morton Assocs., Inc. 416-671-8111

Local Distributors

CA San Diego, Sigma Elctrns. 619-565-2000
IL Lisle, Components, Inc. 312-852-7707
IL Wheeling, Hawk Elctrns. 312-459-4030
MA Canton, Impact Sls. 617-821-1500
MA Hingham, Sager Elctrns. 617-749-6700
NJ Cranford, Garden State Inds. 201-272-6400
NY Buffalo, Summit Distrs. 716-887-2800
NY Mt. Vernon, QAR Indl. Elctrns. 914-699-2224
NY Rome, Rome Elctrns. 315-337-5400
NY Woodside, Switches Unltd. 718-478-5000
NC Charlotte, Dixie Elctrns. 704-377-4348
OH Solon, Repco Elctrns., Inc. 216-248-8900
OR Portland, United Radio Supp. 503-233-5341
SC Columbia, Dixie Elctrns. 803-779-5332
WI Waukesha, Bell Inds. 414-547-8879
Can Scarborough, Carsten Elctrns. Ltd. 416-495-7705

ELECTRO-TECH SYSTEMS, INC., 115 E. Glenside Ave., Glenside, PA 19038, Tel: 215-887-2196, TELEX: 797137; Empl.: 13; *Sls. Mgr.:* Sharon Sandy; *Dist. Mgr.:* Stanley Weitz

ELECTRO VECTOR, INC., 6555 Covey Rd., Forestville, CA 95436, Tel: 707-887-2292, TWX: 510-746-6024; *Sls. Mgr.:* Wayne Brigden

ELECTROVERT, INC., 466 Main St., New Rochelle, NY 10801, Tel: 914-633-0222

ELECTRO WEAVE, 425 Shrewsbury St., Worcester, MA 01604, Tel: 617-752-8932, FAX: 617-753-2173; FSC No.: 54207; Empl.: 18; *Sls. Mgr.:* Peter Andrews

ELFAB CORPORATION, Augat, Inc., 1097 Yates Street, Lewisville, TX 75067, Tel: 214-221-8776, TWX: 910-860-5460, FAX: 214-221-9667; Empl.: 250 ..... **C•1346-1347**

Local Sales Offices & Reps

AL Huntsville, Rick Burns Assocs., Inc. ... 205-776-9481
AZ Phoenix, Spectrum 602-890-9000
CA Los Angeles, Wiley Co. 213-661-1611
CA San Diego, Wiley Co. 619-571-2881
CA San Jose, Augat Sys. Sls. 408-249-8801
CO Denver, Spectrum 303-480-9991
FL Casselberry, S.A. Inc. 305-695-6010
FL Coral Springs, Augat Sls. 305-755-4364
FL Orlando, Augat Corp. 407-345-5255
FL Tampa, SMI Assocs. 813-999-9999
FL Winter Pk., Elfab Corp. 305-678-7759
GA Atlanta, Rick Burns Assocs., Inc. 404-951-1181
IL Crystal Lake, Mid-American Reps., Inc. 815-455-5310
IL Downers Grove, Rockford Controls ... 312-960-2046
IA Marion, Ensco Rep, Inc. 319-377-8551
KS Shawnee Mission, Microtronics 913-262-1444
KS Wichita, Ensco Rep, Inc. 316-683-1070
MD Baltimore, Micro Comp Inc. 301-644-5700
MA Canton, Augat Sls. 617-762-3164
MA Fayesville, Marathon Sls. 617-875-3566
MA Faysville, Marathon Sls., Ltd. 617-875-3566
MI Southfield, Rathburg Assocs., Inc. 313-559-9700
MN Edina, Augat Sls. 612-925-0255
MN Edina, Mel Foster Tech. Sls. 612-941-9790
MO Maryland Hgts., Ensco-Rep, Inc. 314-423-3935
MO St. Charles, Microtronics 314-946-8500
NY N. Syracuse, Advanced Comps. 315-699-2671
NY Yonkers, David Sonkin Assocs. 914-968-8282
NC Raleigh, Rick Burns Assocs., Inc. 919-876-2224
OH Cincinnati, Luebbe Sls. 513-891-5770
OH Columbus, Luebbe Sls. 614-431-0474
OH Richfield, Geotronix, Inc. 216-659-6100
OH Trotwood, Geotronix, Inc. 513-252-6700
OR Portland, Augat Sls. 503-256-4596
OR Portland, Elctrn. Mktg. Grp. 503-684-5935
PA Allison Pk., Geotronix, Inc. 412-487-1770
PA Pittsburgh, Luebbe Sls. 412-364-0490
PA Prospect Pk., Elf Sls. Co. 215-534-3340
TX Dallas, Augat Sls. 214-788-4211
UT Murry, Butterworth Mktg. 801-268-2244
UT Ogden, Spectrum 801-972-8552
VA Huddleston, Micro-Comp Inc. 804-297-6295
WA Bellevue, Augat Sls. 206-451-9777
WA Redmond, Elctrn. Mktg. Grp., Inc. 206-882-0962
WI West Bend, Rockford Controls 312-960-2046
PR Rio Piedras, D.K. Mktg. 809-765-5380
Can Mississauga, Ont., Augat Elctrns., Inc. 416-677-9141
Can Nepean, Ont., Electro Source, Inc. 613-726-8834
Can Rexdale, Ont., Electro Source, Inc. 416-675-6871
Can Vancouver, Davetek Mktg. 604-430-3680

Local Distributors

AZ Phoenix, Cetec Elctrns. 602-272-7951
AZ Phoenix, Force Elctrns. 602-437-1060
CA Chatsworth, Cetec Elctrns. 213-700-0914
CA Irvine, Cetec Elctrns. 714-250-4141
CA Los Angeles, Cetec Elctrns. 213-773-6521
CA San Diego, Cetec Elctrns. 619-278-5020
CA Santa Clara, Cetec Elctrns. 408-748-8550
CT Bethel, Heilind Elctrns. 203-797-8600
MA Peabody, Time 617-532-6200
MA Wilmington, Heilind 617-657-4870
TX Dallas, Force Elctrns. 214-351-2050

ELFORM, INC., P.O. Box 7362, Reno, NV 89510, Tel: 702-356-1734, TWX: 510-600-5662 ELFORM, FAX: 702-356-1742; *Sls. Mgr.:* Roger R. Reinke

ELGAR

FAX: 619-458-0267

ELGAR ELECTRONICS CORPORATION, 9250 Brown Deer Rd., San Diego, CA 92121, Tel: 619-450-0085, 800-854-2213, TELEX: 211063 ELSD UR; FSC No.: 25965; Empl.: 275 ..... **D•1242, 2188-2194**

Local Sales Offices & Reps

AL Huntsville, Beacon 205-881-1136
AZ Tempe, Trembly Assoc. 602-967-2058
CA Redondo Beach, Ward/Davis Assocs. 213-643-6977
CA San Diego, Ward/Davis Assocs. 619-292-1000
CA Santa Clara, Ward Davis Assocs. 408-245-3700
CO Wheat Ridge, Trembly Assocs. 303-421-8900
FL Boca Raton, Beacon 305-997-5740
FL Clearwater, Beacon 813-796-2378
FL Longwood, Beacon 407-332-1940
GA Atlanta, Beacon 404-256-9640
IL Arlington Heights, Dytec/Midwest 312-255-3200
IN Indianapolis, Dytec/Midwest 317-297-5988
KS Lenexa, Dytec/South 913-888-0215
KS Wichita, Dytec/South, Inc. 316-945-7090
MD Laurel, Elctrn. Mktg. Assocs. 301-953-7800
MA Beverly, P. Jenks Assocs. 508-921-4600
MI Madison Heights, WKM Assocs. 313-588-2300
MN Edina, Dytec Instrs. 612-831-7169
MD Maryland Hgts., Dytec/South 314-739-0665
NV Las Vegas, Trembly Assocs. 702-739-9770
NM Albuquerque, Trembly Assoc. 505-266-8616
NY Great Neck, RTI 516-829-3770
NY Syracuse, Labtronics 315-455-7314
NC Raleigh, Beacon 919-787-0330
OH Dayton, WKM Assocs. 513-434-7500
OH Independence, WKM Assocs. 216-524-5930
TX Richardson, Testech, Inc. 214-644-5010
OR Wilsonville, Syntek 503-682-2750
PA Pittsburgh, WKM Assocs. 412-892-2953
PA Plymouth Meeting, Elctrn. Mktg. Assocs. 215-828-7400
UT Salt Lake City, Trembly Assocs. 801-295-4703
WA Bellevue, Syntek 206-462-7700
WI Brookfield, Dytec Midwest 414-792-0320
EXP CA, San Diego, Elgar Intl. Corp. 619-450-0085
PR Santurce, Beacon 809-728-5040

ELGAR/INTEPRO SYSTEMS, 9250 Brown Deer Road, San Diego, CA 92121, Tel: 619-458-0261, 1-800-854-2213, TELEX: 211063 ELSO UR, FAX: 619-458-0267; Empl.: 250; *Sls. Mgr.:* Sam Lewis ..... **D•1242**

Local Sales Offices & Reps

FL Huntsville, Beacon 205-881-1136
AZ Tempe, Trembly Assocs. 602-967-2058
CA Redondo Bch., Ward/Davis Assocs. .. 213-643-6977
CA San Diego, Ward/Davis Assocs. 619-292-1000
CA Santa Clara, Ward Davis Assocs. 408-245-3700
CO Wheat Ridge, Trembly Assocs. 303-421-8900
FL Boca Raton, Beacon 305-997-5740
FL Clearwater, Beacon 813-796-2378
FL Longwood, Beacon 407-332-1940
GA Atlanta, Beacon 404-256-9640
IL Arlington Heights, Dytec/Midwest 312-255-3200
IN Indianapolis, Dytec/Midwest 317-297-5988
KS Lenexa, Dytec/South 913-888-0215
KS Wichita, Dytec/South, Inc. 316-945-7090
MD Laurel, Elctrn. Mktg. Assocs. 301-953-7800
MA Beverly, P. Jenks Assocs. 508-921-4600
MI Madison Hgts., WKM Assocs. 313-588-2300
MN Edina, Dytec Instrs. 612-831-7169
NV Las Vegas, Trembly Assocs. 702-739-9770
NM Albuquerque, Trembly Assocs. 505-266-8616
NY Great Neck, RTI 516-829-3770
NY Syracuse, Labtronics 315-455-7314
NC Raleigh, Beacon 919-787-0330
OH Dayton, WKM Assocs. 513-434-7500
OH Independence, WKM Assocs. 216-524-5930
OR Wilsonville, Syntek 503-682-2750
PA Pittsburgh, WKM Assocs. 412-892-2953
PA Plymouth Meeting, Elctrn. Mktg. Assocs. 215-828-7400
TX Richardson, Testech, Inc. 214-644-5010
UT Salt Lake City, Trembly Assocs. 801-295-4703
WA Bellevue, Syntek 206-462-7700
WI Brookfield, Dytec Midwest 414-792-0320
EXP CA/San Diego, Elgar Intl. Corp. 619-450-0085
PR Santurce, Beacon 809-728-5040

ELGENCO, INC., Box 460, Hurricane, UT 84737, Tel: 801-635-4954, FAX: 801-635-2158; FSC No.: 15455; *Sls. Mgr.:* D. E. Beecher ..... **D•1246-1251**

Local Sales Offices & Reps

CA Sherman Oaks, Windsor Dynamics ... 818-990-4173
CA Sunnyvale, N-S Westronics 408-745-1102
CT Meriden, Polytek Assoc. 203-634-4499
MA Ashland, Polytek Assoc. 508-881-4741
NJ Marmore, SWR Tech., Inc. 609-390-0094
NM Albuquerque, Technology Mktg. Assoc. 505-345-8921
PA Broomall, SWR Tech., Inc. 215-353-6639

ELGIN ELECTRONICS, Combustion Engineering, 5533 New Perry Hwy., Erie, PA 16509-3570, Tel: 814-864-4921, TWX: 510-699-6870, FAX: 814-864-1260; Empl.: 500; *Sls. Mgr.:* D. Selmon

ELITE ELECTRONIC ENGINEERING CO., 1516 Centre Circle, Downers Grove, IL 60515, Tel: 312-495-9770, FAX: 312-495-9785; FSC No.: 099-9999; Empl.: 34

ELITE ELECTRONICS, INC., 1408 Summit - Suite 65, Plano, TX 75074, Tel: 214-881-0026, 800-553-4376, FAX: 214-424-7299; Empl.: 4

Local Sales Offices & Reps

CA Fremont, Abel & Assocs. 415-794-4030
CO Englewood, Chinook Tech. Sls. 303-933-9007

FL Davie, Edwin Weisl 305-474-5601
MD Baltimore, Chesapeake Indl. Mktg. 301-653-0476
MN Golden Valley, Ambassador Indl. Mktg. Inc. 612-542-8437
RI Cumberland, Haddad Sls. 508-584-1880
EXP 800-553-4376
EXP Plano, TX, Elite Elctms. Inc. 800-553-4376,

ELITE SOFTWARE DEVELOPMENT, INC., P.O. Drawer 1194, Bryan, TX 77806, Tel: 409-846-2340, FAX: 409-846-4367; Empl.: 9; *Sls. Mgr.:* Terri J. King

ELLIOTT JORDAN

FAX: 215-296-0657

ELLIOTT/JORDAN, A Sub. of Vishay Intertechnology, 63 Lincoln Highway, Malvern, PA 19355, Tel: 215-644-1300, TWX: 510-668-5812; Empl.: 500; *Dist. Mgr.:* Iris Demeritt ..... **A•1948-1949**

For sales office, representative, and distributor information, see Vishay Resistive Systems Group.

ELMA

FAX: 415-656-3783

ELMA ELECTRONIC INC., 41440 Christy Street, Fremont, CA 94538, Tel: 415-656-3400; Empl.: 35; *Sls. Mgr.:* Kris Holla ..... **B•1738; C•1036-1037, 1585; D•1120-1121**

Local Sales Offices & Reps

AL Huntsville, Pen-Tech 205-881-9298
AZ Scotsdale, I.M. Systems 602-948-1495
CA Cupertino, West-Comp, Inc. 408-245-3100
CA Fremont, Bear Resources 415-793-1064
CA Fremont, ELMA Elctm. Inc. 415-656-3400
CA Irvine, Balzer-Woolf 714-261-6877
CA Orange, Viatek 714-634-8411
FL Boca Raton, Pen-Tech 407-394-7400
FL Orlando, E.M.S. 407-849-0245,800-824-0079
FL Oviedo, Pen-Tech 407-366-8706
GA Roswell, Pen-Tech 404-751-1604
IL Elmhurst, F.F./Hill Gray Inc. 312-832-4101
MD Lisbon, Samuel K. MacDonald Inc. 301-982-1088, 301-442-1590
MN Plymouth, James R. Johnson & Assocs. 612-478-9442
NH Nashua, Bell Controls Inc. 603-882-6984
NY Amsterdam, Traxonics Inc. 508-843-1445
NY Port Chester, Radiation Elctrns., Inc. .. 914-937-2300
NC Greensboro, Pen-Tech 407-366-8706
MA Beachwood, Land Elctm. Supp. Co. 216-831-9555
OH Strongville, Dolfuss-Root & Co. 216-238-0300
PA King of Prussia, KSI 215-783-6400
PA Philadelphia, Samuel K. MacDonald Inc. 215-545-1205
TX Plano, Vielock Assocs. 214-881-1940
WA Bellevue, Cascade Data Mktg., Inc. 206-747-6190

Local Distributors

CT Wallingford, Sager Elctrl. Supp. Co. 203-265-4600
IL Villa Pk., Melvin Elctms. 312-279-5010
MA Lynn, Land Elctm. Cupp. Co. 617-592-2220
MA Waltham, Vantage Elctms. Corp. 617-894-8690
NJ Cranford, Garden State Indl. Elect. 201-272-6400
NJ Cranford, Garden State Indl., Inc. 201-272-6400
PA Philadelphia, PEI-Genesis 215-568-7400

ELMA ENGINEERING, 1066 E. Meadow Circle, Palo Alto, CA 94303, Tel: 415-494-7303, TELEX: 345-560; FSC No.: 59810; Empl.: 38; *Sls. Mgr.:* T. A. Beno; *Dist. Mgr.:* T. A. Beno

ELMAG DIVISION, Lindgren RF Enclosures, 3750 Prospect Ave., Riviera Bch., FL 33404, Tel: 407-881-9292, FAX: 407-844-4175; FSC No.: 23160; Empl.: 15

ELMEC
DELAY LINE

FAX: 213-265-1908

ELMEC TECHNOLOGY OF AMERICA, 1225 Ridge Crest St., Monterey Pk., CA 91754, Tel: 213-265-1861; *Sls. Mgr.:* Steve Sameshima ..... **A•1558-1563**

ELM SYSTEMS, 1101 Brown St., Wauconda, IL 60084, Tel: 312-526-5003, FAX: 312-526-5022

HAWKER SIDDELEY
Elmwood Sensors

FAX: 401-728-5390

ELMWOOD SENSORS, 500 Narragansett Park Drive, Pawtucket, RI 02861, Tel: 401-727-1300, TELEX: 6814066 ELMWOOD; Empl.: 1,000ò; *Sls. Mgr.:* Steve Fox ..... **B•1894-1895**

Local Sales Offices & Reps

AL Decatur, Tenn. Tech. Sls. 205-350-0630
AZ Phoenix, O'Donnell SW 602-944-9542
CA San Diego, O'Donnell Assocs. 619-578-1645
CA San Jose, O'Donnell Assocs. 408-432-1940
CA Torrance, O'Donnell Assocs. 213-539-9664
CO Boulder, Front Range Mktg. 303-443-4780
FL Coral Springs, CBC Electronics 305-755-1111
FL Longwood, CBC Elctrns. 407-831-5390
FL Tampa, CBC Elctrns. 813-969-1901
GA Marietta, Tenn. Tech. Sls. 404-971-1417
IL Arlington Heights, Thermek 312-577-6900
IN Fort Wayne, O. Bromberg 219-456-6010
KY Louisville, O. Bromberg 502-456-1498
KY Southgate, O. H. Bromberg & Assocs. 606-781-0221
MD Glen Burnie, Faber-Renoff, Inc. 301-768-4554
MA Danvers, C. H. Burnham Assoc. 508-774-0111
MI Brooklyn, Engineered Comps. 419-475-4900
MN Minneapolis, C. Listug Sls. 612-881-8143
MO St. Louis, Hill & Co. 314-432-1136
NH Durham, C. H. Burnham Assoc. 603-868-2282
NJ Pitman, Colrud Corp. 609-589-5866
NM Albuquerque, O'Donnell Assocs. 609-889-4522
NY Fairport, Bastian Sls. 716-223-0237
NY Larchmont, G. M. Moch Co. 914-834-3530
NY Syracuse, R. M. Scanlon & Assocs. ... 315-437-1271
NC Raleigh, Tenn-Tech 919-779-3309
OH Cleveland, Allied Entprs. 216-779-0080
OH Dayton, O. H. Bromberg 513-434-8788
OR Hillsboro, Temco-Northwest 503-649-8375
PA Murrysville, Allied Entprs. 412-325-3200
NJ Pittman, Colrud Corp. 609-589-5866
RI Woonsocket, C. H. Burnham Assoc. ... 401-762-9889
TX Austin, Ion Assocs. 512-331-7251
TX Grand Prairie, Ion Assocs. 214-647-8225
TX Houston, Ion Assocs. 713-537-7717
UT Midvale, Front Range Mktg. 801-566-2500
VA Midlothian, Daniel E. Boehling Assocs. 804-794-5879
WA Bellevue, Lehr Assocs. 206-453-9993
WA Birch Bay, Temco B.C. 206-371-0423
WA Bothell, Temco Northwest 206-821-5434
WA Spokane, Temco Northwest 509-534-8635
WI Milwaukee, R. Zingler 414-351-5005
Can Mississauga, Ont., Andy Baumen Assocs. 416-828-2600

ELNA AMERICA, INC., 5686 Corporate Ave., Cypress, CA 90630, Tel: 714-761-8600, TELEX: 68-6427, TWX: 910-346-6730, FAX: 714-761-9188; *Sls. Mgr.:* Michael S. Olson; *Dist. Mgr.:* Michael S. Olson

Local Sales Offices & Reps

AL Huntsville, Jack Harvey & Assocs. 205-461-8591
CA Santa Clara, C-Com Sls. 408-727-2266
CA Westminster, West Elctrns. Sls. 714-898-0120
CO Boulder, R. G. Entprs., Inc. 303-447-9211
FL Lauderhill, Innovative Mktg. 305-485-6869
GA Norcross, Jack Harvey & Assocs. 404-449-4643
IL Berkeley, ESA Techn. Mktg. 312-544-0120
IN Ft. Wayne, M/S Sls. 219-436-3023
KS Prairie Vl, Lima & Assocs. 913-642-7471
MA Norwood, JMG Inc. 617-762-5333
MI W. Bloomfield, Jack Harvey & Assocs. 313-737-9122
MN Bloomington, Murnco 612-854-4161
MN St. Paul, Murnco, Inc. 612-563-3594
NJ Kenilworth, Ventronic's 201-272-9262
NC Research Triangle Park, Jack Harvey & Assocs. 919-361-5885
TN Knoxville, Jack Harvey & Assocs. 615-524-7057
TX El Paso, Alexander, Gene Entprs. 915-542-0091
TX Euless, W. Pat Fralia Co. 817-267-3577
WA Bellevue, Caruso & Co. 206-455-8811
Can Islington, Ont., Pipe-Thompson Ltd. ... 416-236-2355

ELNETIC ELECTRONICS, INC., P.O. Box 88232, Los Angeles, CA 90009-8232, Tel: 213-515-1546; FSC No.: 98460; Empl.: 25; *Sls. Mgr.:* Ernest H. Carlson, Jr.

FAX: 714-241-7293

ELPAC COMPONENTS, Elpac Electronics, Inc., 3131 S. Standard Ave., Santa Ana, CA 92705, Tel: 714-979-4440; Empl.: 130 ..... **A•1076-1077, 1656-1657**

Local Sales Offices & Reps

AZ Phoenix, Eltron 602-266-2164
CA San Diego, Digit Trust 714-498-5749
CA San Jose, Ruppert Sls. 408-998-8717
CA Santa Ana, Jim Degerstrom 714-979-4440
OR Beaverton, Harry Levinson 503-690-1312
FL Orlando, Honeyco Inc. 407-291-7931
IL Highland Park, Bransky Sls. 312-433-2375
IN Indianapolis, J.C. Hofstetter Co. 317-897-7914
MA Needham Heights, Todino Engr. Sls. .. 617-444-7925
MN Bloomington, Smiley-Scott Assocs. ... 612-888-5551
NJ Englewood, Harold Gray Assocs. 201-894-0894
OH Dayton, J. C. Hofstetter Co. 513-296-1010
OH Medina, J. C. Hofstetter Co. 216-241-4880
WA Seattle, Harry Levinson Co. 206-382-1300
WI Cedarburg, Bransky Sls. 414-377-6837

Local Distributors

CA Chatsworth, Mil-Comm 818-998-3111
CA Irvine, Kelex 714-863-1230
FL Melbourne, New Yorker 407-727-0955
FL Lighthouse Point, R.C. Simon 407-941-2757
WI Milwaukee, Progressive 414-321-4722
IL Northbrook, Classic Components 312-272-9650
IL Skokie, Kellner Elctms. 312-677-1120
IA Cedar Rapids, Dee Elctms. 319-365-7551
MA Andover, Aved Elctms. 508-688-3800
NJ S. Hackensack, Waltech 201-641-7300
NY Mamaroneck, New Yorker Elec. 914-698-7600
NJ Wiippany, American Distr. Inc. 201-428-0510
NY Elmsford, Ancar 914-592-7100
OH Dayton, Electro Supp. 513-299-5020
OK Tulsa, Altair Co. 918-252-5781
TX Houston, Altair Co. 713-462-3029
TX Richardson, Altair 214-231-5166
VA Charlotte, Kellner 802-425-3250
WA Seattle, Kam Elec. 206-382-1300
WI New Berlin, Classic 414-786-5300
WI Racine, Badger Elctms. 414-637-1256

ELPAC

FAX: 714-241-7293

ELPAC POWER SYSTEMS, Elpac Electronics, Inc., 3131 S. Standard Ave., Santa Ana, CA 92705, Tel: 714-979-4440; Empl.: 170; *Sls. Mgr.:* H. Myers; *Dist. Mgr.:* H. Myers ..... **D•1744-1746**

Local Sales Offices & Reps

CO Broomfiled, Hannah-Hill 303-460-0602

Local Distributors

MA Burlington, Marshall Inds. 617-272-8200
MA Burlington, QPL Elctms. 617-229-2424
MI Livonia, Marshall Inds. 313-525-5850
MN Plymouth, Marshall Inds. 612-559-2211
NJ Cranford, Garden State Indl. 201-272-6400
NJ Fairfield, Marshall Inds. 201-882-0320
NJ Mt. Laurel, Marshall Inds. 609-234-9100
NY Hauppauge, Broadline Elctms. 212-895-6232
NY Hauppauge, Marshall Inds. 516-273-2424
NY Johnson City, Marshall Inds. 607-798-1611
NY Rochester, Marshall Inds. 716-235-7620
NC Greensboro, Hammond 919-275-6391
OH Dayton, Marshall Inds. 513-236-8088
PA Philadelphia, Shap Elctms. 215-969-3300
SC Greenville, Hammond Elctms. 803-233-4121
TN Austin, Marshall Inds. 512-458-5654
TX Dallas, Heilind Elec. 214-351-2050
TX Dallas, Marshall Inds. 214-233-5200
TX Houston, Marshall Inds. 713-789-6600
TX Houston, Newark Elctms. 713-782-4800
WA Bellevue, Marshall Inds. 206-747-9100
WI New Berlin, Classic Comps. 414-786-5300

ELPAZ INSTRUMENTS, INC., 160 N. Craig St., Pittsburgh, PA 15213, Tel: 412-687-8700, FAX: 412-687-8702; FSC No.: OA2J2; Empl.: 15; *Sls. Mgr.:* Stephen Phelps; *Dist. Mgr.:* Stephen Phelps

E-L PRODUCTS CORP., Sub.of Astronics Co., 77 Olean Rd., E. Aurora, NY 14052, Tel: 716-655-0800, FAX: 716-655-0309; Empl.: 100; *Sls. Mgr.:* Patrick McCann

ELTEC INSTRUMENTS INC., P.O. Box 9610, Daytona Bch., FL 32020, Tel: 904-253-5328, TWX: 810-832-6294, FAX: 904-258-3791; Empl.: 120; *Sls. Mgr.:* Douglas S. Armstrong

ELTROL CORPORATION, 20942 Osborne Street, Bldg. I, Canoga Park, CA 91304, Tel: 818-709-0131, FAX: 818-709-0132; FSC No.: IER54; Empl.: 6; *Sls. Mgr.:* Terry E. Donovan ..... **B•1241**

Local Sales Offices & Reps

CA	Glendale, Halbar Assocs.	818-246-8263
OH	Broadview Hgts., Controlled Prods.	216-838-5700

ELVO:DIVISION OF ZUMBACH ELECTRONICS CORPORATION, 140 Kisco Avenue, Mt. Kisco, NY 10549, Tel: 914-241-1008, TWX: 910-250-5181, FAX: 914-241-7096; *Sls. Mgr.:* Thomas H. Stein

EMCA/ROHM & HAAS, 160 Commerce Dr., Montgomeryville, PA 18936, Tel: 215-855-1000, TWX: 710-566-1128; Empl.: 70; *Sls. Mgr.:* Charlie McBride; *Dist. Mgr.:* John Wagnon

EMCO ELECTRONICS, 31 Sheer Plaza, Plainview, NY 11803, Tel: 516-845-7080, TELEX: 276590, FAX: 516-845-7082; Empl.: 12; *Sls. Mgr.:* K. Berkowitz; *Dist. Mgr.:* Jay Robinson

EMCO HIGH VOLTAGE CO.

FAX: 209-223-2779

EMCO HIGH VOLTAGE CO., 11126 Ridge Road, Sutter Creek, CA 95685, Tel: 209-223-3626, TELEX: 5101008006; FSC No.: 3T243; Empl.: 38; *Sls. Mgr.:* Roxanne McCoy ..... **D•1751-1757**

E/M CORPORATION, 2801 Kent Avenue, P.O. Box 2400, W. Lafayette, IN 47906, Tel: 317-497-6346, FAX: 317-497-6348; FSC No.: 11770

EMCOR PRODUCTS, Crenlo, Inc., 1600 Fourth Ave. NW, Rochester, MN 55901, Tel: 507-289-3371, FAX: 507-287-3405; *Sls. Mgr.:* John Horton ..... **C•1039**

EMC TECHNOLOGY INC, 1971 Old Cuthbert Rd., Cherry Hill, NJ 08034, Tel: 609-429-7800, TWX: 710 896 0193, FAX: 609-429-6814; FSC No.: 24602; Empl.: 70; *Sls. Mgr.:* Peter Semitschew

EMDS, INC., 16618 Oakmont Ave., Gaithersburg, MD 20877, Tel: 301-840-5710, FAX: 301-840-8589; *Sls. Mgr.:* Patrick E. Roney ..... **D•1252**

EMERSON COMPUTER POWER, 330 Standard St., Santa Ana, CA 92702, Tel: 714-545-5581, TELEX: 67-8460, FAX: 714-540-6718; FSC No.: W. T. Brummett; Empl.: 800; *Sls. Mgr.:* R. L. Calvin; *Dist. Mgr.:* W. Rhodes

Please call factory for sales offices and nearest reps.

EMHART CANADA, LTD., See Mallory Components Div.

EMICO INC., Box 368, Dublin, PA 18917, Tel: 215-249-9330, FAX: 215-249-9336; FSC No.: 85925; Empl.: 100; *Sls. Mgr.:* C. Davis

EMI GENCOM INC., See THORN EMI Gencom Inc.

EMI TECHNOLOGY INC., See THORN EMI Technology Inc.

EMM SEMI, SUB OF EM & M, See GTE Microcircuits

Empro SHUNTS ®

FAX: 317-823-4835

EMPRO MANUFACTURING COMPANY, INC., P.O. Box 26060, Indianapolis, IN 46226, Tel: 317-823-4478; Empl.: 25 ..... **D•1253**

Local Sales Offices & Reps

CA	Chula Vista, Brooks-Moore & Assocs.	619-563-8520
CA	La Canada, Brooks-Moore & Assocs.	818-790-8358
CA	Santa Ana, Brooks-Moore & Assocs.	714-541-2044
GA	Atlanta, Brownell Electro Inc.	404-762-5181
IL	Chicago, Best Rep Co.	312-992-1055
MA	Burlington, E.I.L. Instr.	617-272-9450
NJ	Belleville, D. F. Tobias & Co.	201-751-8680
OH	Cleveland, Weschler Elec. Corp.	216-238-2550
PA	Philadelphia, Sunshine Sci. Instr. Inc.	215-673-5600
TX	Arlington, Ev Smith Sls.	817-572-2911
TX	Houston, Ev Smith Sls.	713-931-0403

Local Distributors

CA	Dublin, Std. Meter Lab	415-828-4837
CA	Glendale, Instr. Meter Specialties	818-243-0416
CA	S. Pasadena, Dae Instr. & Svc., Inc.	213-942-8843
LA	Harahan, Indl. Instrs. Works	504-733-8355
MD	Sparks, E.I.L. Instrs.	301-771-4800
NJ	Belleville, Miscorp	201-751-1190
PA	Norristown, Kimberly-James	215-666-7286
TX	Beaumont, Straughn Elctrns.	409-838-4563
TX	Houston, American Analog	713-941-7265
TX	Houston, Meters & Instrs.	713-644-1631
WI	Milwaukee, E-M Instrs.	414-272-7799

EMS

FAX: 714-838-2967

E.M.S., Div. of Sandberg Industries, 2922 Dow Street, Tustin, CA 92680, Tel: 714-669-9473, TWX: 910-595-2767; Empl.: 125; *Sls. Mgr.:* Duane Halverson, VP Sls.; *Dist. Mgr.:* Noel Kennedy ..... **C•1713-1715**

Local Sales Offices & Reps

TX	Austin, Allied Comps., Inc.	512-258-7558
TX	Dallas, Allied Comp., Inc.	214-238-0408
TX	Dallas, Allied Comps., Inc.	214-238-0408
VA	Reston, Tytronics Tech. Sls.	703-620-4600
VA	Reston, Tytronics Tech-Sls.	703-620-4600

E M S DEVELOPMENT CORP., 100 Sea La., Farmingdale, NY 11735, Tel: 516-293-7900, FAX: 516-694-1093; FSC No.: 51435; Empl.: 100; *Sls. Mgr.:* Bob Solomon

EMTRONIX CORPORATION, LEM, SA, Geneva Switzerland, N114 W. 19225 Clinton Dr., Germantown, WI 53022, Tel: 414-255-2620, ESYLNK: 629-38203, FAX: 414-255-0653; Empl.: 53; *Sls. Mgr.:* Richard Koerber

EMULATION TECHNOLOGY, INC., 2368B Walsh Ave, Bldg. D, Santa Clara, CA 95051, Tel: 408-982-0660, TELEX: 981866, FAX: 408-982-0664; Empl.: 9; *Sls. Mgr.:* Joseph J. Bagliere, Jr. ..... **C•1348**

Local Distributors

CA	Monterey, Adams/MacDonald Entrps.	408-373-3607
CO	Denver, Alliance Elctrns. CO	303-433-1648
MI	Bloomfield Hills, Mackellar Assocs.	313-335-4440
TX	Allen, Prime Distributing Co.	214-231-0170

ENCLOSURE CORP., 2900 Wharton Rd., Bristol, PA 19007, Tel: 215-785-2900, FAX: 215-785-2960; FSC No.: 32360; Empl.: 120; *Sls. Mgr.:* Gene Goldner

ENCODER DIV., LITTON SYSTEMS, INC., See Litton Encoder Div.

ENCODER PRODUCTS, 1601B Dover Rd., Sandpoint, ID 83864, Tel: 208-263-8541, FAX: 208-263-0541; Empl.: 100; *Sls. Mgr.:* Vance Conner

ENDEVCO, 30700 Rancho Viejo Rd., San Juan Capistrano, CA 92675, Tel: 714-493-8181, TELEX: 68-5608, TWX: 910-596-1415; FSC No.: 95411; Empl.: 400; *Sls. Mgr.:* D. McMahon

ENDICOTT COIL CO., INC., 24 Charlotte St., Binghamton, NY 13905, Tel: 607-797-1263, FAX: 607-797-0151; Empl.: 110; *Sls. Mgr.:* Thomas E. Frank

ERG™ Endicott Research Group, Inc.

FAX: 607-754-9255

ENDICOTT RESEARCH GROUP, 2601 Wayne St., P.O. Box 269, Endicott, NY 13760, Tel: 607-754-9187, TWX: 510-252-0155; FSC No.: 63312; Empl.: 150 ..... **B•1076-1077, 1142; D•1758-1759**

Local Sales Offices & Reps

AZ	Phoenix, Finn-Pat Co., Inc.	602-954-0301
CA	Saratoga, Testco	408-253-1900
CO	Littleton, MRC	303-794-4684
CT	Bloomfield, Sands Co./Sir Assocs.	203-243-9343
FL	Maitland, EIR, Inc.	305-660-9600
GA	Atlanta, Wallace Electronics	800-334-3518
IL	Elk Grove Village, Carlson Elctrn. Sls.	312-956-8240
IN	Indianapolis, Precision Elctrn. Comps.	317-842-3740
IA	Cedar Rapids, Carlson Elctrn. Sls.	319-377-6341
KS	Wichita, Palatine	319-365-8071
MA	Westford, SIR Assocs.	617-692-2500
MI	West Bloomfield, Granneman & Mize	317-849-2000
MN	Minneapolis, OEM Prods.	612-541-0236
MO	Hazelwood, Palatine	314-839-0800
NJ	Livingston, Eagle Sls. Co.	201-992-2030
NC	Kernersville, Wallace Electronics	919-996-2742
OH	Worthington, Elctrn. Sls. & Technlg.	614-438-2622
PA	Glenshaw, H. C. Johnson Agencies	412-487-1246
PA	King of Prussia, Freedman-Malta Assocs.	215-337-9211
UT	Salt Lake City, MRC	303-794-4684
WA	Bellevue, Testco	206-454-7422
WI	Milwaukee, Carlson Elctrn. Sls.	414-476-2790
Can	Toronto, Ont., Norgay Entprs., Ltd.	416-259-9663

ENERCO, INC., 9615 W. Marginal Way S., Seattle, WA 98108, Tel: 206-762-1422; Empl.: 5; *Sls. Mgr.:* Lee Rabie

ENERGY CONCEPTS INC., 6351-A Yarrow Drive, Carlsbad, CA 92009, Tel: 619-438-2202, TELEX: 01830, FAX: 619-438-0694; FSC No.: 01830; Empl.: 16; *Sls. Mgr.:* Pete Steinmetz

ENERGY ELECTRONIC SYSTEMS, INC, 9486 Deereco Rd., Timonium, MD 21093, Tel: 301-252-2240, 800-233-4544, FAX: 301-561-5412; Empl.: 35; *Sls. Mgr.:* Mike Lynch

ENERGY LTD.

FAX: 301-699-8107

ENERGY, LTD., 4714 Upshur Street, Bladensburg, MD 20710, Tel: 301-699-1144; Empl.: 10 ..... **D•2195**

Local Sales Offices & Reps

MD	Bladensburg, Energy, Ltd.	301-699-1144

Local Distributors

MD	Bladensburg, Energy, Ltd.	301-699-1144

ENERGY SYSTEMS

ENERGY SYSTEMS, 21550 Oxnard St., Woodland Hills, CA 91367, Tel: 818-716-9004; Empl.: 25 ..... **D•1254-1255, 2196-2197**

ENGINEERED ASSEMBLIES CORP., 429 Getty Ave., Clifton, NJ 07011, Tel: 201-340-0600, 1-800-950-9111, FAX: 201-340-0623; Empl.: 50; *Sls. Mgr.:* P. Teen; *Dist. Mgr.:* P. Teen ..... **D•1491**

Local Sales Offices & Reps

FL	Orlando, Engrd. Assemblies Corp.	407-291-6710
GA	Atlanta, Engrd. Assemblies Corp.	404-525-0676
MA	Boston, Engrd. Assemblies Corp.	617-227-5455
NC	Raleigh, Engrd. Assemblies Corp.	919-790-9700

ENGINEERED COMPONENTS CO., P. O. Box 8121, San Luis Obispo, CA 93403-8121, Tel: 805-544-3800, FAX: 805-544-8091; FSC No.: 32440; Empl.: 250

ENGINEERED MAGNETICS, INC., A Fleet Aerospace Company, 18435 Susana Rd., Rancho Dominguez, CA 90221, Tel: 213-635-9555, TWX: 910-325-6208; FSC No.: 06509; Empl.: 250

ENGINEERING DESIGN & SLS., One E.D.S. Way, Danville, VA 24541, Tel: 804-792-6405, FAX: 804-792-6415; Empl.: 75; *Sls. Mgr.:* Mark Gignac

ENGINE SYSTEMS DIVISION, Simmonds Precision, P.O. Box 310, Norwich, NY 13815, Tel: 607-335-5000, TWX: 510-261-7776; Empl.: 750; *Sls. Mgr.:* G. D. Cummings

ENGLER INSTRUMENTS OPERATION, See Stemco Instruments, Colt Inds.

ENI, INC., Emerson Electric Co., 100 Highpower Road, Rochester, NY 14623, Tel: 716-427-8300, TELEX: 671-1542 ENI UW, FAX: 716-427-7839; Empl.: 348 ..... **D•1011**

Local Sales Offices & Reps

AL	Huntsville, Teqspec	205-721-1701
AZ	Tempe, Trembly Assocs.	602-967-2058
CA	Los Angeles, Scientific Devices	213-477-8556
CA	Santa Clara, ENI, Inc.	408-727-0993
CO	Wheat Ridge, Trembly Assocs.	303-421-8900
FL	Palm Harbor, Teqspec	813-785-2276
GA	Norcross, Teqspec	404-242-7215
IL	Elmhurst, Sector Engrg.	312-530-7850
IN	Indianapolis, Sector Engrg.	317-842-1120
KS	Lenexa, Ramsey Assocs.	913-541-1007
MD	Silver Spring, Gawler Knoop Co.	301-589-4406
MA	Westford, ICS Assocs.	617-692-3545
MI	Madison Heights, WKM Assocs.	313-588-2300
MN	Minneapolis, Sector Engrg.	612-593-1809
MO	St. Louis, Ramsey Assocs.	314-532-9386
NV	Las Vegas, Trembly Assocs.	702-739-9770
NM	Albuquerque, Trembly Assocs.	505-266-8616
NY	Great Neck, RTI, Inc.	516-829-3770
NY	Rochester, Taerep, Inc.	716-586-8710
NY	Whitney Pt, Taerep, Inc.	607-692-3705
NC	Winston Salem, Teqspec	919-765-5553
OH	Dayton, WKM Assocs.	513-434-7500
OH	Independence, WKM Assocs.	216-524-5930
PA	Holicong, John Bell Assocs.	215-794-7075
PA	Philadelphia, WKM Assocs.	215-924-6228
TX	Houston, Lear Assocs.	713-488-7893
TX	Richardson, Lear Assocs.	214-231-5388
UT	N. Salt Lake, Trembly Assocs.	801-295-4703
WI	Milwaukee, Sector Engrg.	414-352-8280
Can	Downsview, Rayonics Scientific	416-736-1600
Can	St. Laurent, Que., Rayonics Sci., Inc.	514-335-0105

ENPROTECH CORP., 445 West Michigan Ave., Kalamazoo, MI 49007, Tel: 616-381-0665, FAX: 616-381-9810; Empl.: 125 ..... **B•1953**

Local Sales Offices & Reps

AZ	Phoenix, Trembly Assoc.	602-967-2058
CA	Simi Valley, Motion Technlg. Inc.	805-581-9493
CO	Denver, Trembly Assoc.	303-421-8900
FL	Melbourne, Reynolds & Assoc.	407-259-7000
GA	Lilburn, Reynolds & Assoc.	800-255-1965
IA	Davenport, H & H Vega Sls.	319-326-5664
KS	Kansas City, H & H Vega Sls.	913-432-6363
MI	Detroit, Xanthus, Inc.	313-528-2000
MN	Minneapolis, Mackubin Grp.	612-636-5533
NV	Las Vegas, Trembly Assocs.	702-739-9770
NH	Salem, Servo Comps., Inc.	603-898-6798
NM	Albuquerque, Trembly Assocs.	505-266-8616
NY	Rochester, A & D Devices	716-385-2778
OH	Columbus, Oyl-Air Specialty	614-882-5066
SC	Greenville, Reynolds & Assoc.	800-255-1965
TX	Dallas, Seaton Corp.	214-980-9860
UT	Salt Lake City, Trembly Assoc.	801-295-4703
WI	Milwaukee, Sensus Co.	414-964-1553

ENTECH CORPORATION

FAX: 203-658-2740

ENTECH CORPORATION, 17A Herman Drive, Simsbury, CT 06070, Tel: 203-658-2740, 203-651-9557 ..... **B•1739**

ENTECH SYSTEMS, INC., 17B Herman Dr., Simsbury, CT 06070, Tel: 203-651-9557, FAX: 203-658-2740; *Sls. Mgr.:* A. D. Jorczak

ENTRA CORPORATION, 8651 Castle Park Drive, Indianapolis, IN 46151, Tel: 317-849-8270, FAX: 317-849-7041; Empl.: 50; *Sls. Mgr.:* Paul D. Nelson

Entran

FAX: 201-227-6865

ENTRAN DEVICES, 10 Washington Ave., Fairfield, NJ 07006, Tel: 201-227-1002, 800-635-0650, TELEX: 130-361; *Sls. Mgr.:* Daniel M. Slavik ..... **B•1954-1955**

Local Sales Offices & Reps

AZ	Phoenix, J. Smith & Assocs.	602-267-0981
CA	Long Beach, Saber Entprs.	213-595-5646
CA	Mtn. View, Saber Entprs.	415-968-0427
CA	San Diego, Saber Entprs.	619-271-1523
CO	Colorado Springs, J. Smith & Assoc.	303-597-5343
CT	Wallingford, Pond Tech. Sls.	203-284-1500,
FL	Clearwater, Structural Engrg. & Test Svc.	813-442-7767
GA	Smyrna, Quantum Meas.	404-433-0093
IL	Woodstock, TMI Inc.	815-385-2212
MA	Waltham, Pond Tech. Sls.	617-890-5535,
MI	Huntington Woods, Stress Analysis Svcs.	313-542-8260
NJ	Budd Lake, Measurements, Inc.	201-770-1281
NM	Albuquerque, J. Smith & Assocs.	505-345-6501,
NY	Clarence, Trott Electrns.	716-634-8500
NY	Pittsford, Trott Elctrns.	716-586-8251
NC	Chapel Hill, Quantum Meas.	919-933-7408
OH	Medina, Stress Analysis Svc.	216-725-7733
OH	Middleton, Stress Analysis Svcs.	513-422-7900
OR	Bend, Data Signal	503-389-2661,
PA	Carnegie, Stress Analysis	412-276-7755
PA	Exton, Measurements, Inc.	215-524-0310
TX	Dallas, Pace Tech. Sls.	214-368-0135
TX	San Antonio, Pace Tech. Sls.	512-826-7181
VA	Fredericksburg, Measurements, Inc.	703-373-5520
WI	Oregon, TMI Inc.	608-835-5527
Can	Ontario, Intertechnology	416-445-5500

ENTRELEC, Alsthom International, 2 Ram Ridge Rd., Spring Valley, NY 10977, Tel: 914-425-7460, FAX: 914 425 8108; Empl.: 50; *Sls. Mgr.:* F. D. Leynaert

ENVIRONMENTAL COMM., 3150 Pullman St, Costa Mesa, CA 92627, Tel: 714-557-7800, FAX: 714-957-3160; FSC No.: 16450; Empl.: 65; *Sls. Mgr.:* Robert Denish

ENVIRONMENTAL CONTAINER SYS., INC., See ECS Composites

EOG, INC., OMX, INC., 10947 Golden West Drive, Hunt Valley, MD 21030, Tel: 301-785-3000, TWX: 87932, FAX: 301-771-5814; FSC No.: 17521; Empl.: 150; *Sls. Mgr.:* Arthur C. Rutledge, Jr.; *Dist. Mgr.:* Arthur C. Rutledge, Jr.

EPC IDENTIFICATION SYS., 505 Martin Ave., Rohnert Park, CA 94928, Tel: 707-585-8811, TWX: 910-3382-311, FAX: 707-585-8688; FSC No.: 67041; Empl.: 16; *Sls. Mgr.:* Astrid Harper; *Dist. Mgr.:* Astrid Harper

EPCO PRODUCTS INC., P.O. Box N. Cottage St., WAllkill, NY 12589, Tel: 914-895-2033, FAX: 914-895-2279; Empl.: 45; *Sls. Mgr.:* Mark Giegel

E.P.D./GENERAL POWER CORP., 1045 So. East Street, Anaheim, CA 92805-8508, Tel: 714-520-0881, 1-800-343-1813, TELEX: 678870 ATTN:EPD, FAX: 714-491-8644; Empl.: 150; *Sls. Mgr.:* Don Royer,Sls. Dir.; *Dist. Mgr.:* Connie Kouri

EPD ELECTRONICS INC.

FAX: 213-515-5011

EPD ELECTRONICS, INC., 16921 S. Western Ave., Ste. 110, Gardena, CA 90247, Tel: 213-515-4996, TELEX: 691-738; Empl.: 6 ..... **C•1349; D•1256-1257, 1760**

Local Sales Offices & Reps

IA	Burlington, JS Ridge Entprs., Inc.	319-754-8745
NJ	Bricktown, Bryan Elctrn. Sls. Co.	201-840-8487
OR	Portland, Dale G. Weber Co.	503-234-0686
TN	White House, Apple Sls. & Mktg.	615-672-4498

EPE TECHNOLOGIES, INC., 1660 Scenic Avenue, Costa Mesa, CA 92626, Tel: 714-557-1636, FAX: 714-957-1103; Empl.: 350; *Sls. Mgr.:* Joe T. Amos, Jr.

EPH ENGINEERING ASSOCIATES, INC., 31 E. 400 St., Orem, UT 84058, Tel: 801-226-1383, TWX: 453161 EPHYCERAM, FAX: 801-226-1437

EPIC, INC., 150 Nassau St, New York, NY 10038, Tel: 212-349-2470, TELEX: 12-6231, FAX: 212-406-2508; Empl.: 8; *Sls. Mgr.:* Peter Letica

EPOXYLITE CORP., 9400 Toledo Way, P.O. Box 19671, Irvine, CA 92713, Tel: 714-951-3231, FAX: 714-472-0980; FSC No.: 11147; Empl.: 60

EPOXY TECHNOLOGY, INC., 14 Fortune Dr., Billerica, MA 01821, Tel: 508-667-3805, 800-227-2201, TELEX: 94-7140, FAX: 508-663-9782; FSC No.: 33246; Empl.: 18

EPSCO, 1020 W. Fullerton Ave., Ste. D, Addison, IL 60101, Tel: 312-543-0410, FAX: 312-543-0592; FSC No.: 53003; Empl.: 8; *Sls. Mgr.:* Wendie Amerena ..... **D•1750**

Local Distributors

AZ	Phoenix, Fisher Sci.	602-995-1556
AR	Little Rock, Carlton-Bates Co.	501-562-9100
CA	Santa Barbara, Abbecon Cal Inc.	805-966-0810
CO	Denver, Sargent-Welch	303-399-8220
FL	Mirimar, Aero Quality Sls.	305-432-2288
IL	Elmhurst, McMaster-Carr Supp.	312-834-9600
IL	Niles, Joseph Elctrns.	312-297-4200
IN	East Chicago, Acro Elctrns. Corp.	219-397-8681
KY	Louisville, Peerless Elctrn. Equip.	502-637-7674
LA	New Orleans, Radio Parts	504-581-5959
MA	Rockville, Capital Radio Whlsrs.	301-881-2270
MA	Westwood, VWR Scientific	617-461-1880
MI	Lansing, Fulton Radio Supp.	517-394-5020
MN	Eden Prairie, Allied Elctrns.	612-829-7554
NJ	Teterboro, Mars Aircraft Radio	201-288-0222
NM	Albuquerque, Walker Elec. Supp.	505-883-2992
NY	Amherst, Standard Elctrns.	716-691-3801
OH	Warren, Rem Elctrns. Supp.	216-373-1300
PA	Pittsburgh, Allied Elctrns.	412-367-4124
RI	Providence, A & J Distrs., Inc.	401-421-0991
SC	Charleston, Wholesale Inds. Elec.	803-722-2634
TX	Ft. Worth, Allied Elctrns.	817-336-5401
TX	Houston, Angie Elctrns.	713-659-8686
WA	Kent, Fisher Scientific	206-872-0330
WI	Milwaukee, Industrial Elctrns. Supp.	414-276-1212

EPSILON-LAMBDA ELCTRNS. CORP., 427 Stevens St., Geneva, IL 60134, Tel: 312-232-9611, FAX: 312-232-9613; Empl.: 30; *Sls. Mgr.:* R. Knox

EPSON

FAX: 213-534-4449

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FL	Largo, Burke Assoc.	813-536-4335
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CA	Anaheim, Everest Elctrn. Equip., Inc.	714-634-2200
CO	Broomfield, B-5, Inc.	303-466-1761
CT	Tariffville, OEM Mktg. & Sls	203-241-1612
FL	Orlando, Honeyco, Inc.	305-299-1000
GA	Lawrenceville, Everest Elctrn. Equip., Inc.	404-995-8688
GA	Lawrenceville, Tek-Rep Mktg.	404-963-1600
GA	Marietta, Southern Equip. Add-On, Inc.	404-953-3970
MD	Linthicum, KD Assocs.	301-859-5151
MA	Dedham, Pall Assocs.	617-461-0402
MA	Franklin, OEM Mktg. & Sls.	617-528-4983
MN	Eden Prairie, Choice-Tech, Inc.	612-941-5099
MN	Golden Valley, Tech Resources, Inc.	612-546-6099
NH	Salem, OEM Mktg. & Sls.	603-893-0009
NY	Port Washington, Ashtec, Inc.	516-767-0336
NC	Winston-Salem, Southern Equip. Add-On, Inc.	919-724-1187
OH	Akron, Augnat Assocs.	216-239-2499
PA	Blue Bell, Techparts	215-628-3200
PA	Mendenhall, Clark H. Bach & Assocs.	215-388-7903
TX	Austin, Kruvand Assocs., Inc.	512-441-6777
TX	Dallas, Kruvand Assocs., Inc.	214-437-3355
TX	Houston, Kruvand Assocs., Inc.	713-956-6741
TX	Plano, Digital Elctrn. Sys.	214-423-6056

EVEREST ELECTRONIC EQUIPMENT, INC., 2100 E. Orangewood Avenue, Anaheim, CA 92806, Tel: 714-634-2200, FAX: 714-634-1369; Empl.: 200; *Sls. Mgr.:* Barry Holman; *Dist. Mgr.:* Mike Bullock ..... **C•1053**

EVEREST INTERSCIENCE, INC., P. O. Box 3640, Fullerton, CA 92634-3640, Tel: 714-992-4461, TELEX: 295368 EVER UR, FAX: 714-992-1178; Empl.: 20; *Sls. Mgr.:* Steve A. Giffin; *Dist. Mgr.:* Marilyn M. Everest

EVERETT/CHARLES CONTACT PRODUCTS, 700 E. Harrison Ave., Pomona, CA 91767, Tel: 714-625-5551, TELEX: 67-55-78, TWX: 910-581-1210; Empl.: 75; *Sls. Mgr.:* Bud Fabian

EVERETT/CHARLES TEST EQUIPMENT, INC., 2887 N. Towne Ave., Pomona, CA 91767, Tel: 714-621-9511, FAX: 714-626-4540; Empl.: 110; *Sls. Mgr.:* Raymond Berggren

EVERLIGHT USA

FAX: 213-690-8067

EVERLIGHT - USA, 614 W. Alosta Ave., Ste. 303, Glendora, CA 91740, Tel: 213-697-5067; *Sls. Mgr.:* John Cox; *Dist. Mgr.:* John Cox ..... **B•1143**

EVERSHED & VIGNOLES, LTD., Meggitt Holdings P. L. C., Acton Lane, Chiswick, London, England W4 5HJ, Tel: 01-994-3670, TELEX: 22583, FAX: 01-994-5246; Empl.: 300; *Sls. Mgr.:* J. Gilpin

EVI, INC., 8300 Guilford Rd., Ste. A, Columbia, MD 21046, Tel: 301-290-9550, FAX: 301-381-5687; Empl.: 20

EVOX-RIFA INC., 100 Tri State International, Ste. 290, Lincolnshire, IL 60069, Tel: 708-948-9511, FAX: 708-948-9320; Empl.: 2000; *Sls. Mgr.:* D.A. Price; *Dist. Mgr.:* D.A. Price ..... **A•1078-1079**

Local Sales Offices & Reps

AL	Huntsville, Hughes Assoc.	205-533-9108
AZ	Phoenix, ISDS	602-971-6250
CA	Burbank, DeAngelo, Rothman & Co.	818-504-2425
CA	Santa Clara, Caltron Comps.	408-980-0181
CT	Wallingford, Apex Assocs.	203-269-8401
FL	Deerfield Beach, Sales Engrg. Concepts	305-426-4601
GA	Norcross, Hughes Assoc.	404-662-1561
ID	Boise, Cascade Comps.	208-343-9886
IL	Chicago, M. Gottlieb Assoc.	312-775-1151
IN	Kokomo, M. Gottlieb Assoc.	317-455-0444
MA	Westwood, Apex Assoc.	617-326-5042
MN	Bloomington, Murnco	612-854-4161
MS	Corinth, Hughes Assoc.	601-287-2915
NJ	Kenilworth, Ventronics	201-272-9262
OH	Cincinnati, G&H Sls.	513-272-0582
OR	Portland, Westmark	503-641-8780
TN	Nashville, Hughes Assoc.	615-871-0908
TX	Dallas, Tesco, Inc.	214-553-1200
VA	Manassas, FBD Sls.	703-369-7212
WA	Seattle, Westmark	206-281-4025
Can	Markham, Ont., SP Intl.	416-475-5305

Local Distributors

CA	Burbank, TAW	818-846-3911
CA	Garden Grove, Natl. Capacitor	714-892-7749
CA	Industry, Ital Elctrn. Sls.	818-968-8515
CA	Milpitas, California Capacitors	408-262-6000
CA	Santa Ana, Projections Unltd.	714-261-2323
CT	Norwalk, Delta Elctrns.	203-847-7285
FL	Ft. Lauderdale, NRC	305-772-4500
IL	Addison, Belford Elctrns.	312-691-1100
IL	Chicago, Bell Inds.	312-982-9210
MD	Bletsville, Resco/Washington	301-937-9100
MA	Burlington, TLC	617-273-0140
MA	Wilmington, JV Elctrns.	617-657-6523
MN	Eitzen, Capacitor Assocs.	507-495-3130
MN	New Brighton, Chris Elctrns.	612-631-2647
NJ	E. Brunswick, Varitech	516-593-9300
NJ	Kenilworth, Ventronics/Mutronics	201-272-9262
NY	Farmingdale, SAI	516-293-2710
NY	Hauppauge, JACO Elctrns.	516-273-5500
NY	Ronkonkoma, Prime	516-737-1730
OR	Lake Oswego, Bell Inds.	503-241-4115
PA	Philadelphia, JAN Indl.	215-922-1321
TX	Ft. Worth, C & W Supp.	817-831-0395

EWALD INSTRUMENTS CORP., Rte. 7R, Kent, CT 06757, Tel: 203-927-3278, FAX: 203-927-3031

EWC® INC.

FAX: 201-245-8430

EWC, INC., 725 Federal Ave., Kenilworth, NJ 07033, Tel: 201-245-3200, 800-526-4048, TWX: 710-996-5993; FSC No.: 15387;MIL-T-27D; Empl.: 175; *Sls. Mgr.:* Jay Stevenson; *Dist. Mgr.:* Jay Stevenson ..... **A•1247, 2284-2298**

Local Sales Offices & Reps

AL	Huntsville, Rakes Engrg. & Mktg.	205-533-3763
CA	Canoga Park, Cummings & Assocs.	818-340-6035
CA	Los Gatos, Featherstone Sls.	408-356-3243
CO	Denver, AKI Entprs.	303-388-4488
FL	Clearwater, Tech-Rep Assocs.	813-576-9900
GA	Atlanta, Rakes Engrg. & Mktg.	404-447-6937
IL	Schaumburg, Delta Tech. Sls. Corp.	312-310-0280
IA	Cedar Rapids, Pattison Sls.	319-395-9866
MD	Gaithersburg, Deltatronics	301-253-0615
MA	Chelmsford, Interstate Sls. Assocs.	617-256-2287
MO	St. Louis, Clyde Logsdon & Assocs.	314-849-5125
NJ	E. Brunswick, Winch Assoc.	201-828-4615
NY	Pittsford, James E. Zimmerman Sls.	716-381-3186
NY	Plainview, Winch Assocs.	516-681-3163
OH	Chagrin Falls, Crest Comp. Sls.	216-543-9808
OR	Portland, SPS Elctrns.	203-243-9343
PA	Chestnut Hill, Deltatronics, Inc.	215-248-0294
PA	Youngwood, Pro-Mark	412-925-1905
TX	Dallas, Rem Air Comps.	214-234-1069
VA	Powhatan, Deltatronics Inc.	703-492-9027
WI	Mequon, Tumy Assocs.	414-473-6997

Local Distributors

CA	Mountain View, Abacus Elctrns.	415-961-1500

EXAR CORP., 2222 Qume Dr., P.O.Box 49007, San Jose, CA 95161-9007, Tel: 408-732-7970, TWX: 910-339-9233; Empl.: 600; *Dist. Mgr.:* Tom Wargo

EXATRON AUTOMATIC TEST EQUIP., 2842 Aiello Dr., San Jose, CA 95111, Tel: 408-629-7600, 800-EXA-TRON, TELEX: 172-090, FAX: 408-629-2832; Empl.: 24; *Sls. Mgr.:* Kathryn Henderson

Local Sales Offices & Reps

AZ	Tempe, Turner & Assocs.	602-967-5649
CA	Covina, Romar Intl.	818-332-8548
CA	San Jose, Paragon	408-246-8415
FL	Largo, Synergetic Rep. Inc.	813-586-2871
MA	Tyngsboro, J.R. Sls.	617-692-4110
MN	New Brighton, Pragmatic Technlg.	612-631-1981
NJ	Medford, E.E. Sys.	609-953-1414
NC	Apex, Miller Technlg.	919-362-7587
OH	Hudson, Technical Sls.	216-656-3978
TX	Austin, Eldredge Entprs.	512-869-4500
TX	Dallas, Eldredge Entprs.	214-907-2402
WA	Lacy, Olympia Hunter	206-491-8668

EXCEL SPECIALTY CORP., 6335 N. Broadway, Chicago, IL 60660, Tel: 312-262-4781, FAX: 312-262-1330; Empl.: 50

XCEL

FAX: 201-874-3278

EXCEL TECHNOLOGY INTL. CORP., 5-4 Stryker La., Belle Mead, NJ 08502, Tel: 201-874-4747, TWX: 910-333-9588; *Sls. Mgr.:* Michi Chen ..... **B•1078-1079**

Local Sales Offices & Reps

CA	Los Angeles, Electro-Optical Mktg.	818-890-1749
IL	Westchester, W. G. Brouillette & Assocs., Inc.	312-345-6500
MO	Independence, Engrg. Svcs. Co.	816-254-3600
MO	St. Louis, Engrg. Svcs. Co.	314-997-1515
OR	Portland, Frank Jackson, Assoc.	503-292-2638
TX	Dallas, Southwest Elctrn. Inds.	214-690-9881

Local Distributors

CA	Los Angeles	213-824-0988

EXCELTA CORPORATION, 3740 Skypark Dr., Torrance, CA 90505, Tel: 213-772-0751, FAX: 213-378-4923; Empl.: 25; *Sls. Mgr.:* G. Johnson; *Dist. Mgr.:* L. Johnson

EXEL MICROELECTRONICS, INC., Sub. of Exar Corp., 2150 Commerce Dr., San Jose, CA 95131, Tel: 408-432-0500, TELEX: 171339, TWX: 910-338-2116, FAX: 408-434-6444; Empl.: 180; *Sls. Mgr.:* Victor Okumoto

EXFO E.O. ENGINEERING, 352 St.-Sacrement Ave., Quebec City, Quebec, Canada G1N 3Y2, Tel: 418-683-0211, TELEX: 051-3786, FAX: 418-683-2170; Empl.: 20; *Sls. Mgr.:* Germain Lamonde; *Dist. Mgr.:* Ginette Bourgeois

EXIDE CORPORATION, 645 Penn St., Reading, PA 19601, Tel: 215-378-0500, TWX: 510-651-5288, FAX: 215-378-0345; Empl.: 2200

EXPRESS TEST CORP., 1161 D San Antonio Rd., Mountain View, CA 94043, Tel: 415-968-8818, TELEX: 4942091; FAX: 415-968-0649; *Sls. Mgr.:* Frank S. Gavin

EXTECH INSTRUMENTS CORP., 150 Bear Hill Rd., Waltham, MA 02154, Tel: 617-890-7440, TELEX: 940913; *Sls. Mgr.:* Robert M. Shipione

EYRING RESEARCH INST., INC., 1455 W. 820 N., Provo, UT 84601, Tel: 801-375-2434, TELEX: 882000, FAX: 801-374-8339; Empl.: 150

E-Z HOOK, Tektest Inc., 225 N. Second Ave., Arcadia, CA 91006, Tel: 818-446-6175, TELEX: 910-582-1614, FAX: 818-446-0972; FSC No.: 08505; Empl.: 23; *Sls. Mgr.:* Charles Haskin; *Dist. Mgr.:* Charles Haskin ..... **C•1350-1352**

Local Sales Offices & Reps

CA	Arcadia, Ash M. Wood Co.	213-447-3511
CA	Arcadia, E-Z-Hook	818-446-6175
CA	Santa Clara, David H. Ross Co.	415-591-4411

Fabricast, Inc.

FABRICAST, 2517 Seaman Ave., P.O. Box 3176, S. El Monte, CA 91733, Tel: 818-443-3247; FSC No.: 13345; Empl.: 8 ..... **B•1246-1251**

FACET ENTERPRISES, INC., 3 Miracle Mile, P.O. Box 1502, Elmira, NY 14902, Tel: 607-737-8011, TELEX: 6854130, FAX: 607-737-8335; FSC No.: 72850; Empl.: 400; *Sls. Mgr.:* Gene Ebbrecht

FAGOR ELCTRN. COMPS., INC., CORP. HDQTRS. & SLS. OFF., Fagor Electronica S. Coop., 121 W. 27th St., 4th Fl, New York, NY 10001, Tel: 212-463-7168, 800-283-8383, FAX: 212-463-7199; *Sls. Mgr.:* Marvin R. Zidel, VP Mktg.

FAGOR ELCTRN. COMPS., INC., NATL. MKTG. SLS. OFFS., Fagor Electrotecnica S. Coop., 8419 Canoga Ave., Canoga Pk., CA 91304, Tel: 818-718-2500, 800-624-5367, TWX: 910-494-1948, FAX: 818-341-2860; Empl.: 18,000; *Sls. Mgr.:* Marvin R. Zidel, VP Mktg.; *Dist. Mgr.:* Marvin R. Zidel, VP Mktg.

FAIRBANKS SCALES:FAIRBANKS INC., 711 E. St. Johnsbury Rd., St. Johnsbury, VT 05819, Tel: 800-451-4107, 802-748-5111

FAIRCHILD WESTON, DATA RECORDERS, Fairchild Weston Sys., Inc., P.O. Box 3041, Sarasota, FL 34230, Tel: 813-371-0811, FAX: 813-378-1893; FSC No.: GS-00K-8301-S0078; Empl.: 750; *Sls. Mgr.:* Ron Johnson

FAIRCHILD WESTON SYSTEMS, INC., CCD Imaging Division, 1801 McCarthy Blvd., Milpitas, CA 95035, Tel: 408-433-2500, TWX: 910-373-2110, FAX: 408-433-2508; *Sls. Mgr.:* Jim Johnson; *Dist. Mgr.:* Patricia A. Lippe

FAIRCHILD - WESTON - TELEMETRY, P.O. Box 3041, Sarasota, FL 34230, Tel: 813-371-0811, FAX: 813-378-1893; FSC No.: 06141; Empl.: 825; *Sls. Mgr.:* F. V. Bud Hinkel

F/R **Fair-Rite Products Corp.**

FAIR-RITE PRODS., PO Box J, Wallkill, NY 12589, Tel: 914-895-2055, TWX: 510-249-4819; FSC No.: 34899; Empl.: 2000; *Sls. Mgr.:* B. G. Tolen ..... **C•1735**

Local Sales Offices & Reps

AL	Huntsville, Macro Mktg. Assocs.	205-883-9630
CA	Anaheim, Micrometals	714-630-7420
CA	San Jose, Veer Mktg.	408-432-1818
CO	Littleton, MRC	303-794-4684
CT	Simsbury, The Pettigrew Co.	203-651-4321
FL	Deerfield Bch., Cartwright & Bean	305-429-3400
FL	Orlando, Cartwright & Bean	407-422-4531
IL	Wheaton, Charles D. Atwater Assocs.	312-668-2303
IN	Ft. Wayne, Frank J. Campisano Co.	219-486-6443
IN	Indianapolis, Frank J. Campisano Co.	317-253-7651
MI	Farmington Hills, J. L. Montgomery Assocs.	313-489-0099
MN	Bloomington, Holmes & Ladky Assocs.	612-884-2125/2126
NY	Hempstead, Kahgan Brody Assoc.	516-538-2300
OH	Cincinnati, F. J. Campisano & Assocs.	513-574-7111

OH Columbus, Frank J. Campisano Co. ... 614-876-5405
OH Medina, Frank J. Campisano Co. 216-722-5550
OR Beaverton, Quest Mktg., Inc. 503-641-7377
PA Coraopolis, Frank J. Campisano Co. .. 412-264-5151
TX Dallas, SEI (S.W. Elec. Inds.) 214-690-9881
TX Vidor, SEI (S.W. Elec. Inds.) 409-786-1028
VA Front Royal, Eltron Sls., Ltd. 703-635-7201
VA Roanoke, A. B. Kreger & Co. 703-989-4738
WA Bellevue, Quest Mktg., Inc. 206-747-9424
WI West Bend, Charles D. Atwater 414-338-3881
Can Islington, Ont., Pipe-Thompson Ltd. ... 416-236-2355

Local Distributors
CA Sunnyvale, Permag 408-738-1000

FANCORT INDUSTRIES, INC., 31 Fairfield Place, W. Caldwell, NJ 07006, Tel: 201-575-0610, TELEX: 130540, FAX: 201-575-9234; Empl.: 20; *Sls. Mgr.:* Ron Corey; *Dist. Mgr.:* Ron Corey

FAN-S CORP., See Qualtek Electronics Corp.

FARIA, THOMAS G., CORP., P.O. Box 983, Uncasville, CT 06382-0983, Tel: 203-848-9271, FAX: 203-848-2704; FSC No.: 09527; Empl.: 250; *Sls. Mgr.:* A. Knupp

FARRAND CONTROLS, Div. of Farrand Industries, Inc., 99 Wall St., Valhalla, NY 10595, Tel: 914-761-2600, TELEX: 646-640, FAX: 914-761-0405; Empl.: 120; *Sls. Mgr.:* George A. Quinn; *Dist. Mgr.:* George A. Quinn

FASTEK TEST SYSTEMS, Div. of International Fastek Corp., 1198 Joshua Way, Vista, CA 92083, Tel: 619-598-9990, TELEX: 188912 ATSD UT, FAX: 619-598-9994; *Sls. Mgr.:* Jim Falk, Sls. Mgr.,No. Amer.

FASTEX, Illinois Tool Works, 195 Algonquin Rd., Des Plaines, IL 60016, Tel: 312-299-2222, TWX: 910-233-2786; FSC No.: 02768; Empl.: 300; *Sls. Mgr.:* Andy Flis; *Dist. Mgr.:* Denis Singery

FDK AMERICA, INC., Fuji Electrochemical Co., Ltd., 17326 Edwards Rd., Ste. A-130, Cerritos, CA 90701, Tel: 213-404-1770, FAX: 213-404-2850; *Sls. Mgr.:* Yasu Yasutani ..... **A•1328, 1658-1659; D•1495**

Local Sales Offices & Reps
CA San Jose, FDK America, Inc. 408-432-8331
NJ Englewood Cliffs, FDK America, Inc. .. 201-567-1900

F-DYNE ELCTRNS., 449 Howard Ave., Bridgeport, CT 06605, Tel: 203-367-6431, TWX: 710-453-0087; Empl.: 175; *Sls. Mgr.:* Robert Furst

FEDERAL ELECTRONICS, 75 Stamp Farm Rd., Cranston, RI 02921, Tel: 401-944-6200, FAX: 401-946-6280; FSC No.: 69343; Empl.: 150; *Sls. Mgr.:* Timothy Collins

FEEDBACK, 620 Springfield Ave., Berkeley Hghts., NJ 07922, Tel: 201-464-5181; Empl.: 28; *Sls. Mgr.:* John Lawson

FEI MICROWAVE, INC., Frequency Electronics, Inc., 825 Stewart Dr., Sunnyvale, CA 94086, Tel: 408-732-0880, TWX: 910-339-9207, FAX: 408-733-7434; FSC No.: 21847; Empl.: 450; *Sls. Mgr.:* P. Thesing

FEMA ELCTRNS. CORP., 12-6 Edgeboro Rd., E. Brunswick, NJ 08816, Tel: 201-238-1223, FAX: 201-238-7981; Empl.: 10 to 20; *Sls. Mgr.:* Bob Cheng; *Dist. Mgr.:* E. Wong

FEME ELECTRONICS, INC., 661 W. Germantown Pike, No. 206, Plymouth Meeting, PA 19462, Tel: 215-941-0366, TWX: 910-240-4181, ESYLNK: 62773739, FAX: 215-941-0377

FENWAL INC., 400 Main St., Ashland, MA 01721, Tel: 508-881-2000, TELEX: 948421, FAX: 508-881-6729; Empl.: 1000; *Sls. Mgr.:* F. R. Shea

FENWAL ELECTRONICS/APD, Kidde, Inc., 450 Fortune Blvd., Milford, MA 01757, Tel: 508-478-6000, TELEX: 29550, FAX: 508-473-6035; Empl.: 450; *Sls. Mgr.:* Bernard Mikula; *Dist. Mgr.:* Chester Tricca ..... **B•1896**

Local Sales Offices & Reps
AL Huntsville, Macro Mktg. Assocs., Inc. .. 205-883-9630
AZ Phoenix, Dorton Entprs., Inc. 602-944-2957
CA Cupertino, Codella Mktg. Grp., Inc. 408-257-2561
CA Garden Grove, Elsco Elctrns., Inc. 714-891-4621
CO Denver, Spectrum Mktg. Assocs., Inc. 303-480-9991
CT Southington, The Orion Grp. Inc. 203-621-8371
FL Orlando, Col-Ins-Co./Datarep 407-423-7615
GA Norcross, Macro Mktg. Assocs., Inc. 404-662-5580
IL Chicago, Century Elctrns. Corp. 312-777-9700
IN Greenwood, Valentine & Assocs. 317-888-2260
IN South Bend, Valentine & Assocs. 219-288-7070
IA Cedar Rapids, Palatine Engrg. & Sls., Inc. 319-365-8071
MD Gaithersburg, Naudain Assoc. So., Inc. 301-258-5040
MA Wakefield, The Orion Grp., Inc. 508-245-5220
MI Royal Oak, Hilltronics, Inc. 313-435-0920
MN So. St. Paul, Northport Engrg., Inc. 612-457-8000
MO Blue Springs, Palatine Engrg. & Sls., Inc. 816-229-4007
MO Hazelwood, Palatine Engrg. & Sls., Inc. 314-839-0800
NY Huntington, CDB Entprs. 516-692-5200
NY Penfield, Upstate Comps. Sls., Inc. 716-381-6070
NC Raleigh, Prime Comps., Inc. 919-850-9866
OH Cleveland, Arthur H. Baier Co. 216-461-6161
OH Dayton, Arthur H. Baier Co. 513-276-4128
OH Westchester, Arthur H. Bair Co. 513-779-2395
OH Worthington, Arthur H. Baier Co. 614-764-1144
OR Tigard, Elctrn. Comp. Sls. 503-245-2342
PA Pittsburgh, Bear Mktg., Inc. 412-531-2002
PA Wynnewood, Metz-Benham Assoc., Inc. 215-896-7300
TX Austin, W. Pat Fralia Co. & Assoc., Inc. 512-835-7911
TX Evless, W. Pat Fralia Co. & Assoc., Inc. 817-267-3577
TX Houston, W. Pat Fralia Co. & Assoc., Inc. 713-772-1572
UT Ogden, Spectrum Mktg. Assocs., Inc. .. 801-972-8552
WA Mercer Island, Elctrn. Comp. Sls. 206-232-9301
WI Milwaukee, Century Elctrns. Corp. 414-645-3680
EXP MA, Milford, Fenwal Elctrns. 508-478-5255
Can Que., John G. Weiss Co., Ltd. 514-337-5022

Local Distributors
CA Chatsworth, Mil-Comm Distr. 818-998-3111
CA San Jose, Rose Elctrn. Distr. 408-943-0200
CO Denver, Newark-Denver Elctrn. Supp. 303-757-3351
CO Englewood, Indl. Elctrns. Corp. 303-694-9444
FL Clearwater, Newark Elctrns. 813-443-0661
GA Norcross, Newark Elctrns. 404-448-1300
IL Chicago, Newark Elctrns. Corp. 312-784-5100
IN Indianapolis, Bell Inds. 317-875-8200
MD Ellicott City, Newark Elctrns. 301-461-2300
MA Woburn, Newark Elctrns. 617-935-8350
MI Oak Park, Newark Elctrns. 313-967-0600
MN Hopkins, The Joel Co. 612-935-6202
MN Minneapolis, Stark Elec. 612-332-1325
NJ Pennsauken, Newark Elctrns. 609-663-9490
NY Buffalo, Summit Dists. 716-887-2800
NY Huntington, CDB Dev. Corp. 516-692-5200
NY Rochester, Summit Elctrns. 716-334-8110
NY Ronkonkoma, Arrow Elctrns., Inc. 516-467-1000
NC Winston-Salem, Kirkman Elctrns. 919-722-9131
OH Cleveland, Newark Elctrns. 216-391-9330
OK Tulsa, Radio, Inc. 918-587-9123
PA Wynnewood, Metz-Benham Assoc., Inc. 215-896-7300
TX Fort Worth, Patco Supply 817-429-8596
TX Garland, Newark Elctrns. 214-494-5911
UT Salt Lake City, Standard Supp. 801-486-3371
WI Grafton, Lake-View Elctrns. Corp. 414-377-8250
Can Que., John G. Weiss Co., Ltd. 514-337-5022

FERNO-SALESMAKER, Ferno-Washington, Inc., 70 Weil Way, Wilmington, OH 45177, Tel: 513-382-1451, TELEX: 214282, FAX: 513-382-1191; Empl.: 450

FERRANTI INTERDESIGN, INC., 1500 Green Hills Rd., Scotts Valley, CA 95066, Tel: 408-438-2900, TELEX: 4940840, TWX: 910-339-9374; Empl.: 240

FERRANTI INTERNATIONAL
Ferranti Venus

FAX: 516-752-7976

FERRANTI VENUS, INC., Ferranti International, 399 Smith St., Farmingdale, NY 11735, Tel: 516-293-4100, TWX: 510-224-6492; Empl.: 450; *Sls. Mgr.:* Joseph T. McCabe ..... **D•1764-1765**

Local Sales Offices & Reps
AZ Scottsdale, Ferranti Venus, Inc. 602-991-9684
MA Norwood, MPS Electronics Inc. 617-769-8700
NY Hartsdale, Spectrum Sls. 914-472-8600
Can Nepean, Ont., Subtec Ltd. 613-723-7720

FERRAZ CORPORATION, 14 Eastmans Rd., Parsippany, NJ 07054, Tel: 201-428-8400, 800-526-9067, TELEX: 136045, FAX: 201-428-0599; Empl.: 100; *Sls. Mgr.:* Douglas L. Bennett; *Dist. Mgr.:* Douglas L. Bennett

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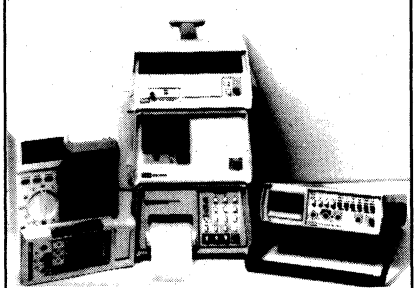

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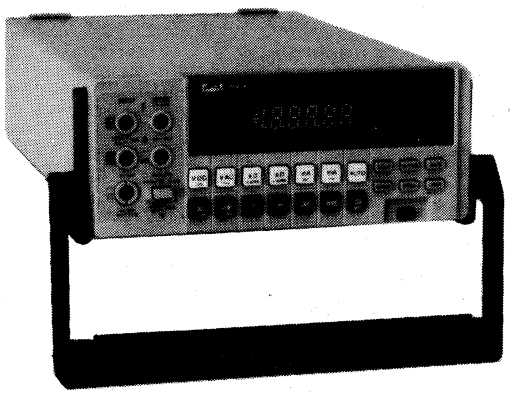

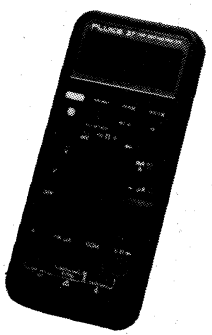

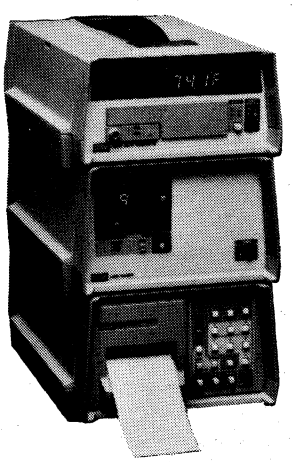

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WI	Waukesa, Janus Inc.	414-542-7575
PR	Hato Rey, Semtronic Assocs.	809-776-0700

Local Distributors

AL	Hunstville, Marshall Inds.	205-881-9235
AZ	Phoenix, Force Elctrns.	602-437-1060
AZ	Phoenix, Future Elctrns. Inc.	800-642-8722
AZ	Phoenix, Marshall Inds.	602-496-0290
AZ	Phonenix, Future Elctrns. Corp.	602-968-7140
AZ	Tempe, Cypress Elctrns.	602-966-2256
CA	Buena Park, Cypress Elctrns.	213-744-0355
CA	Chatsworth, Future Elctrns. Corp.	818-700-0914
CA	Chatsworth, Marshall Inds.	818-407-4100
CA	El Monte, Marshall Inds.	818-459-5500
CA	El Monte, Marshall Inds.	818-459-5602
CA	Irvine, Future Elctrns. Inc.	714-250-4141
CA	Irvine, Integrated Elctrns. Corp.	714-837-9960
CA	Irvine, Marshall Inds.	714-859-5050
CA	Irvine, Marshall Inds.	714-458-5301
CA	Milpitas, Marshall Inds.	408-942-4600
CA	Rancho Cordova, Marshall Inds.	916-635-9700
CA	Reseda, Jan Devices	818-708-1100
CA	Sacramento, Integrated Elctrns. Corp.	916-424-5297
CA	San Diego, Cypress Elctrns.	619-535-0011
CA	San Diego, Future Elctrns Corp.	619-278-5020
CA	San Diego, Marshall Inds.	619-578-9600
CA	San Jose, Future Elctrns. Corp.	408-435-9100
CA	San Jose, Integrated Elctrns. Corp.	408-435-1000
CA	San Jose, Jaco Elctrns. Inc.	408-432-9290
CA	Santa Clara, Future Elctrns. Corp.	408-434-1114
CA	Santa Clara, Marshall Inds.	408-980-2500
CA	Westlake Village, Jaco Elctrns. Inc.	805-495-9998
CO	Denver, Integrated Elctrns. Corp.	303-292-6121
CO	Denver, IEC/Walker Assocs.	313-292-6121
CO	Englewood, Cypress Elctrns.	303-792-5892
CO	Thornton, Marshall Inds.	303-451-8383
CO	Westminster, Future Elctrns. Corp.	303-421-0123
CT	Bethel, Future Elctrns. Corp.	203-743-9594
CT	Meriden, Jaco Elctrns. Inc.	800-344-3458
CT	Wallingford, Cronin Elctrns. Inc.	203-265-3134
CT	Wallingford, Marshall Inds./CT Div.	203-265-3822
FL	Altamonte Sprgs., Future Elctrns. Corp.	407-767-8414
FL	Altamonte Sprgs., Marshall Ind.	407-767-8585
FL	Clearwater, Future Elctrns. Corp.	813-578-2770
FL	Fort Lauderdale, Marshall Inds.	305-977-4880
FL	Fort Lauderdale, Reptron Elctrns. Inc.	305-735-1112
FL	St. Petersburg, Marshall Inds.	813-573-1399
FL	Tampa, Reptron Elctrns. Inc.	813-855-4656
GA	Norcross, Future Elctrns. Corp.	404-441-7676
GA	Norcross, Marshall Inds.	404-923-5750
GA	Norcross, Reptron Elctrns. Inc.	404-446-1300
IL	Hoffman Estates, Integrated Elctrns. Corp.	312-843-2040
IL	Schaumburg, Future Elctrns. Corp.	312-882-1255
IL	Schaumburg, Marshall Inds.	312-490-0155
IL	Schaumburg, Reptron Elctrns.Inc.	312-882-1700
IL	Wood Dale, Altex /Ald Chicagoland	312-350-1080
IN	Carmel, Altex Elctrns. Inc.	800-852-7411
IN	Indianapolis, Marshall Inds.	317-297-0483
KS	Lenexa, Marshall Inds.	913-492-3121
MD	Columbia, Future Elctrns. Corp.	800-638-1851
MD	Columbia, Jaco Elctrns. Inc.	301-995-6620
MD	Gaithersburg, Marshall Inds.	301-840-9450
MA	Hopkinton, Add Elctrns.	508-435-5010
MA	Needham, Cronin Elctrns. Inc.	617-449-5000
MA	Westboro, Future Elctrns. Corp.	800-440-0050
MA	Wilmington, Jaco Elctrns. Inc.	617-273-1860
MA	Wilmington, Marshall Inds.	617-658-0810
MI	Grand Rapids, Calder Elctrns.	616-698-7400
MI	Grand Rapids, EC Elctrns. Inc.	616-530-0576
MI	Livonia, Future Elctrns. Corp.	313-261-5270
MI	Livonia, Marshall Inds.	313-525-5850
MI	Livonia, Reptron Elctrns. Inc.	313-525-2700
MN	Eden Prairie, Cypress Elctrns.	612-934-2104
MN	Eden Prairie, Future Elctrns. Corp.	612-944-2200
MN	Minnetonka, Reptron Elctrns. Inc.	612-938-0000
MN	Plymouth, Marshall Inds.	612-559-2211
MO	Bridgeton, Marshall Inds.	314-291-4650
MO	St. Louis, Franklin Elctrns.	314-993-5333
NH	Manchester, Cronin Elctrns. Inc.	603-624-0105
NJ	Bellmawr, Mid Atlantic Elctrns.	609-931-5303
NJ	Fairfield, Marshall Inds.	201-882-0320
NJ	Mount Laurel, Future Elctrns. Corp.	609-778-7600
NJ	Mt. Laurel, Marshall Inds.	609-234-9100
NJ	Totowa, Jaco Elctrns. Inc.	201-942-4000
NY	Buffalo, Summit	716-887-2800
NY	E. Syracuse, Add Elctrns.	315-437-1836
NY	Hauppauge, Future Elctrns.Corp.	516-234-4000
NY	Hauppauge, Jaco Elctrns. Inc.	516-273-5500
NY	Hauppauge LI, Marshall Inds.	516-273-2424
NY	Johnson City, Marshall Inds.	607-798-1611
NY	Liverpool, Future Elctrns. Corp.	315-451-2371
NY	Rochester, CAM/RPC	716-427-9999
NY	Rochester, Future Elctrns. Corp.	716-272-1120
NY	Rochester, Marshall Inds.	716-235-7620
NY	Rochester, Summit	716-334-8110
NY	Victor, Add Elctrns.	716-924-4760
NC	Raleigh, Marshall Inds.	919-878-9882
NC	Raleigh, Sager Svce. Plus	919-850-9550
OH	Cleveland, CAM/RPC	216-461-4700
OH	Dayton, Marshall Inds.	513-898-4480
OH	Solon, Marshall Inds.	216-248-1788
OH	Solon, Reptron Elctrns. Inc.	800-445-7476
OH	Westerville, Marshall Inds.	614-891-7580
OH	Worthington, Reptron Elctrns. Inc.	614-436-6675
OR	Beaverton, Almac Elctrns.	503-629-8090
OR	Beaverton, Cypress Elctrns.	503-641-2233
OR	Beaverton, Future Elctrns. Corp.	503-645-9454
OR	Beaverton, Integrated Elctrns.Corp.	503-641-1690
OR	Beaverton, Marshall Inds.	503-644-5050
PA	McKean, Adacom	814-476-7774
PA	Pittsburg, CAM/RPC	412-782-3770
PA	Pittsburg, Marshall Inds.	412-963-0441
TX	Austin, Force Elctrns.	512-835-7395
TX	Austin, Marshall Inds.	512-837-1991
TX	Brownsville, Marshall Inds.	512-542-4589
TX	Carrollton, Marshall Inds.	214-233-5200
TX	Dallas, Cypress Elctrns.	214-869-1435
TX	El Paso, Marshall Inds.	915-593-0706
TX	Farmer Branch, Force Elctrns. of TX	214-247-9955
TX	Fort Worth, C & W Elctrns. Supp. Co.	817-831-0395
TX	Houston, Force Elctrns.	713-561-8644
TX	Houston, Marshall Inds.	713-895-9200
TX	Richardson, Future Elctrns. Corp.	214-437-2437
TX	Richardson, Jaco Elctrns. Inc.	214-235-9575
UT	N. Salt Lake City, Integrated Elctrns. Corp.	801-298-1868
UT	Salt Lake City, Future Elctrns. Corp.	801-972-8489
UT	Salt Lake City, Marshall Inds.	801-485-1551
WA	Bellevue, Almac Elctrns.	206-643-9992
WA	Bellevue, Integrated Elctrns. Corp.	206-455-2727
WA	Bellevue, Marshall Inds.	206-486-5747
WA	Bothell, Cypress Elctrns.	206-483-1144
WA	Redmond, Future Elctrns. Corp.	206-881-8199
WA	Redmond, Jaco Elctrns.Inc.	206-881-9700
WA	Spokane, Almac Elctrns.	509-924-9500
WI	Grafton, Lakeview Elctrns.	414-377-8250
WI	Milwaukee, Progressive Image Inc.	414-321-4722
WI	Waukesha, Marshall Inds.	414-797-8400
EXP	PA, Advacom	412-325-7551

FRAMAR METAL PRODUCTS CO., INC., 345 Carnegie Avenue, Kenilworth, NJ 07033, Tel: 201-241-0710, FAX: 201-241-1876; Empl.: 7; *Sls. Mgr.:* John W. Moore, Jr.

JOHN FRANEK CO., INC., See Power Star, Inc.

FREDERICK ELECTRONICS CORP., 7630 Hayward Rd., P.O. Box 502, Frederick, MD 21701-0502, Tel: 301-662-5901, TELEX: 197639, 64682, FAX: 301-694-2756; FSC No.: 15230; Empl.: 350; *Sls. Mgr.:* William H. Herbert

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FREED TRANSFORMER CO., INC., Electronic Transformer Corp., P.O. Box 188, Totowa, NJ 07511, Tel: 201-942-2222, FAX: 201-942-9014; Empl.: 130; *Sls. Mgr.:* Dan Rovine

FTS

FAX: 508-927-4099

FREQUENCY AND TIME SYSTEMS, INC., DATUM, INC., 34 Tozer Rd., Beverly, MA 01915, Tel: 508-927-8220, TELEX: 94-0518 FTS BVLY; FSC No.: 56219; Empl.: 126; *Sls. Mgr.:* Martin W. Levine ..... **D•1271**

Local Sales Offices & Reps

AL	Huntsville, Southern Mktg. Assocs.	205-534-6020
AZ	Phoenix, Tech. Mktg. Specialists	602-582-4800
CA	Costa Mesa, Ward Davis Assocs.	714-556-7466

CA Redondo Bch., Ward Davis Assocs. ... 213-643-6977
CA San Diego, Ward Davis Assocs. 619-292-1000
CA Santa Clara, Ward-Davis Assocs. 408-245-3700
FL Largo, Electrocraft 813-530-4749
FL Longwood, Southern Mktg. Assocs. ... 305-682-7317
GA Marietta, Southern Mktg. Assocs. 404-565-0603
IL Park Ridge, Electronic Instr. Assocs. .. 312-298-2290
IN Indianapolis, Electronic Instr. Assocs. 317-257-7231
MD Rockville, Creative Mktg. Assocs., Ltd. 301-251-4100
MA Tewksbury, Del-Con Sls. 617-851-9911
MN Minneapolis, Electronic Instr. Assocs. 612-374-5628
NJ Haddonfield, G. L. Williams Assocs. ... 609-428-6060
NJ Union, Friedman Assocs., Inc. 201-964-6204
NY Liverpool, R & D Assocs. 315-457-0100
NC Greensboro, Southern Mktg. Assocs. 919-282-6001
OH Centerville, Micro Sls. Corp. 513-433-8171
TX Houston, Lear Assocs., Inc. 713-488-7893
TX Richardson, Lear Assocs., Inc. 214-231-5388

FREQUENCY CONTROL PRODUCTS, INC., American Time Products Div., 430 Commack Rd, Deer Pk., NY 11729, Tel: 516-243-5730, TWX: 710-581-0014, FAX: 516-243-5745; FSC No.: 59559;03040; Empl.: 100; *Sls. Mgr.:* A. Caggiano

Local Sales Offices & Reps

CA Los Angeles, Johnson Assocs. 213-670-4795
CA San Luis Obispo, Johnson Assocs. ... 805-544-7770
FL Altamonte Springs, Raycom 407-682-0032

FAX: 508-521-1839

FREQUENCY DEVICES, INC., 25 Locust St, Haverhill, MA 01830, Tel: 508-374-0761, TWX: 710-347-0314; Empl.: 40; *Sls. Mgr.:* Frank J. DeGiso ..... **A•1695-1698**

Local Sales Offices & Reps

CA San Ramon, Tech. Consultants, Inc. ... 415-830-0829
CA Upland, HAB Assocs. 714-981-0529
FL Orlando, Digital Analog Intl. Sls. 305-299-7754
IL Chicago, Kingston Comps. 312-477-7800
MD College Park, Ken Geary & Son, Inc. .. 301-935-5055
MA Holbrook, McLellan Assoc. 617-767-4771
MA Holbrook, McLellan Assocs. 617-767-4771
MI Livonia, Lowell-Wendt Mkt. 313-464-2722
NJ East Brunswick, Winch Sls. Assocs. ... 201-613-1515
NY DeWitt, DB Environmental, Inc. 315-446-0220
NY Roslyn Heights, Winch Sls. Assocs. ... 516-681-3163
NC Charlotte, Zeico Assoc. 704-541-6122
OH Chagrin Falls, Hester Assocs. 216-247-6655
PA Sellersville, Tech-Com Mktg. 215-723-0820
TX Houston, TCI Elctrns. 713-774-5019
WA Seattle, Brett Assocs. 206-431-8090
Can Don Mills, Ontario, R. D. Assocs. 416-444-0959

FAX: 516-794-4340

FREQUENCY ELECTRONICS, INC., 55 Charles Lindbergh Blvd., Mitchel Field, NY 11553, Tel: 516-794-4500, TWX: 510-223-0418; Empl.: 950; *Sls. Mgr.:* Gene Kushner ..... **A•1408-1409**

Local Sales Offices & Reps

CA Mountainview, Disman-Baker 415-969-3010
CO Boulder, Herb Bass Assoc. 303-530-7509
FL Orlando, Truex Assoc. 305-859-2160
MD Hunt Valley, Marktron 301-628-1111
MD Rockville, Marktron 301-251-8990
MA Cochituate, High-Tech Sls. 508-653-3838
NJ East Windsor, Micro Lambda 609-443-3113
NJ Totawa, Technical Mktg. 201-812-0356
NY E. Syracuse, EM-Tech Assocs., Inc. ... 315-437-6410
OH Cleveland, Tiby Co. 216-371-5335
VA Charlottesville, Marktron 804-973-5874

FREQUENCY SELECTIVE NETWORKS, 69-20 Garfield Ave., Woodside, NY 11377, Tel: 718-424-7500, FAX: 718-424-3459; FSC No.: 56662; Empl.: 30; *Sls. Mgr.:* Michael L. Izzolo ..... **A•1410**

Local Sales Offices & Reps

NY Huntington, Carnes Assocs. 516-694-1600
OH Dayton, Aschbacher Assocs. 513-252-7785

FREQUENCY SOURCES, INC., Semiconductor Div., 16 Maple Rd., Chelmsford, MA 01824, Tel: 508-256-4113/8101, TWX: 710-343-0404, FAX: 508-937-3748; FSC No.: 26629; Empl.: 90; *Sls. Mgr.:* D. Langan

FRONTIER ELECTRONICS CO., LTD.

FAX: 818-709-9897

FRONTIER ELECTRONICS, 9301-101 Jordan Ave., Chatsworth, CA 91311, Tel: 818-709-9888; Empl.: 200 ..... **A•1248-1250; D•2052-2055**

FRONT PANEL DEVICES, INC., 2140-5 Pond Rd., Ronkonkoma, NY 11779, Tel: 516-737-3322, FAX: 516-737-3326; Empl.: 20; *Sls. Mgr.:* John B. Powers

FSI/FORK STANDARDS, INC., 666 Western Ave., Lombard, IL 60148, Tel: 312-231-3511, 312-932-9380, FAX: 312-932-0016; FSC No.: 14986; Empl.: 20; *Sls. Mgr.:* Alfredo J. Ramirez; *Dist. Mgr.:* A. E. Toht

FTS SYSTEMS, INC., Rte. 209, P.O. Box 158, Stone Ridge, NY 12484, Tel: 914-687-0071, TWX: 510-247-0547, FAX: 914-687-7481; Empl.: 1000; *Sls. Mgr.:* Brian Adams

FUJI ELECTRIC CORP. OF AMERICA, 727 W. 7 St., Ste. 235, Los Angeles, CA 90017, Tel: 213-622-4490, TELEX: 677318, FAX: 213-488-9382; Empl.: Yasuko Suzuki; *Sls. Mgr.:* Hisao Ohno; *Dist. Mgr.:* Masanao Deguchi

FUJITSU

FUJITSU AMERICA, INC., Computer Products Group, 3055 Orchard Dr., San Jose, CA 95134, Tel: 408-432-1300, TWX: 910-338-2193; *Sls. Mgr.:* Roger Baldelli; *Dist. Mgr.:* Al Connelly ..... **D•1088-1095**

Local Sales Offices & Reps

CA Irvine, Fujitsu America 714-553-1250
CA San Jose, Fujitsu America 408-434-9250
CA San Jose, Fujitsu America 408-452-0890
CA Sherman Oaks, Fujitsu America 818-905-1985
CO Golden, Fujitsu America 303-278-8717
FL Ft. Lauderdale, Fujitsu America 305-771-7705
GA Atlanta, Fujitsu America 404-953-0130
GA Marietta, Fujitsu America 404-953-0130
IL Itasca, Fujitsu America 312-250-8230
MA Burlington, Fujitsu America 617-273-1341
MA Burlington, Fujitsu America 617-229-6310
MN Minnetonka, Fujitsu America 612-932-9800
NJ Manasquan, Fujitsu America 201-223-8222
OR Beaverton, Fujitsu America 503-643-6098
PA Malvern, Fujitsu America 215-648-3958
TX Austin, Fujitsu America 512-343-4514
TX Richardson, Fujitsu America 214-437-9377
Can Mississauga, Fujitsu Canada 416-673-8666

Local Distributors

AL Huntsville, Gentry Assocs. 205-837-0692
AZ Phoenix, Wyle Laborotories 602-866-2888
CA Irvine, Wyle Laborotories 714-863-9953
CA Richmond, Gates/FA Distrbg. 415-526-2345
CA Santa Clara, Wyle Laboratories 408-727-2500
CA Torrance, Schweber Elctrns. 213-320-8090
CO Englewood, R2 Distrbg. 303-799-9292
CT Danbury, Schweber Elctrns. 203-748-7080
FL Ft. Lauderdale, Gentry Assocs. 305-791-8405
GA Atlanta, Gentry Assocs. 404-998-2828
IL Elmhurst, Fast Access 312-530-2450
IA Cedar Rapids, Schweber Elctrns. 319-373-1417
LA Gretna, Gentry Assocs. 504-367-3975
MA Bedford, Schweber Elctrns. 617-275-5100
MN Minneaplis, Datalink 612-944-3462
OH Columbus, Cranel, Inc. 614-433-0045
OK Tulsa, Schweber Elctrns. 918-622-8000
OR Hillsboro, Wyle Laborotories 503-640-6000
TX Houston, Dallas Digtal 713-469-7151
TX Plano, Dallas Digital 214-424-2800
WA Kirkland, Gates/FA Distrbg. 206-822-5552

FUJITSU

FAX: 408-727-0355

FUJITSU OF AMERICA, 3330 Scott Blvd., Santa Clara, CA 95054, Tel: 408-562-1000, TWX: 910-338-0190; Empl.: 40; *Sls. Mgr.:* Jack Foster (acting); *Dist. Mgr.:* Hal Mumma ..... **B•1040, 1080, 1477-1487; C•1361-1366**

Local Sales Offices & Reps

AL Huntsville, C.S.R. Elctrn. 205-533-2444
CA San Diego, Earle Assocs., Inc. 619-278-5441
CA Santa Clara, Norcomp 408-727-7707
CA Tustin, Hi-Tech Rep Co.(HTRC) 714-730-9561
CA Westlake Village, Hi-Tech Rep Co.(HTRC) 818-706-2916
CO Lakewood, Candal 303-935-7128
CT Cheshire, Connecticut Applied Technlg. 203-272-6564
FL Altamonte Springs, Semtronics Assocs. 305-831-8233
FL Clearwater, Semtronics 813-461-4675
FL Ft. Lauderdale, Semtronics 305-731-2484
GA Atlanta, C.S.R. Elctrns. 404-396-3720
IL Highland Park, Bransky Sls. 312-433-2375
IA Cedar Rapids, Electromec Sls., Inc. ... 319-362-6413
KS Lenexa, A.E.M. Inc. 913-888-0022
MA Woburn, Mill-Bern Assocs., Inc. 617-932-3311
MI Farmington Hills, W. R. Hummon Assocs. 313-474-0661
MN Burnsville, Electromec Sls., Inc. 612-894-8200
MO St. Louis, A.E.M. Inc. 314-298-9900
NJ Fairfield, Tech. Applications & Mktg. ... 201-575-4130
NJ Marlton, BGR Assocs. 609-983-1020
NM Albuqueque, F.P. Sls. 505-345-5553
NY Rochester, H.C. Johnson Agy. 716-586-0777
NC Mathews, C.S.R. Elec. 704-847-5806
NC Raleigh, C.S.R. Elctrn. 919-878-9200
OH Columbus, McFadden Sls. Inc. 614-761-3177
OR Beaverton, L-Squared Ltd. 503-629-8555
PA Glenshaw, H.C. Johnson Agy. 412-487-1246
TN Knoxville, C.S.R. Elctrn. 615-577-1317
UT Salt Lake City, Hendrickson Sls. 801-467-1445
WA Seattle, L-Squared Ltd. 206-827-8555
WI Cedarburg, Bransky Sls. 414-377-6837
Can St. Laurent, Que., John G. Weiss Co. .. 514-337-5022
Can Vancouver, Davetek Mktg. 604-430-3680

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FUJITSU MICROELECTRONICS, INC., Sub. of Fujitsu Limited, 3545 North First St., San Jose, CA 95134, Tel: 408-922-9000, TWX: 910-338-0190; FSC No.: 408-432-9044; Empl.: 1000; *Sls. Mgr.:* Rich Christopher, Sr. VP & GM; *Dist. Mgr.:* Dan Buist, Dir. Hdqtr. Sls.

FURANE PRODUCTS, A Ciba-Geigy Co., 99 Cook St., Lincoln, RI 02865, Tel: 401-723-2100, TWX: 510-601-1913, FAX: 401-723-2930; Empl.: 26; *Sls. Mgr.:* W. Lott

FURMAN SOUND, INC., 30 Rich St., Greenbrae, CA 94904, Tel: 415-927-1225, TELEX: 425900, FAX: 415-927-4548; FSC No.: 5830; Empl.: 32; *Sls. Mgr.:* Joe Desmond; *Dist. Mgr.:* Joe Desmond

FURNAS ELEC., 1197 McKee St., Batavia, IL 60510, Tel: 312-879-6000, TELEX: 72-0458; Empl.: 1,500; *Sls. Mgr.:* Thomas J. McGavin; *Dist. Mgr.:* Paul P. Welch

FUSES UNLIMITED, D.E.I., 9300 Mason Av., Chatsworth, CA 91311, Tel: 818-882-1515, FAX: 818-885-7390; Empl.: 35; *Sls. Mgr.:* Ray Norris; *Dist. Mgr.:* Pat White

FUSION INC., 4658 E. 355th. St., Willoughby, OH 44094, Tel: 216-946-3300, TELEX: 275300; Empl.: 85; *Sls. Mgr.:* Raymond C. Yuhasz

FUTABA CORPORATION OF AMERICA, Electronic Components Div., 711 East State Pkwy., Schaumburg, IL 60173, Tel: 312-884-1444, TELEX: 23-206833, FAX: 312-884-1635; Empl.: 50; *Sls. Mgr.:* Bill Lichtner; *Dist. Mgr.:* Bill Lichtner

F. W. CAPACITORS INC., 98 Toledo Rd. Hwy. 3015, Florence, SC 29504-0636, Tel: 803-662-4728, TELEX: 220 883 TAUR, FAX: 803-667-6142; FSC No.: 58368; Empl.: 20; *Sls. Mgr.:* Joseph A. (Jay) Falcone Jr.

GABRIEL ELECTRONICS, Box 70, Scarborough Indl. Pk., Scarborough, ME 04074, Tel: 207-883-5161, TELEX: 95-0113, ESYLNK: 62042511, FAX: 207-883-4469; Empl.: 225; *Sls. Mgr.:* D. B. Crisman

GAGE APPLIED SCIENCES INC., 5905 St. Francois Rd., St. Laurent, Que., Canada H4S1B6, Tel: 514-337-6893, FAX: 514-337-8411; Empl.: 4; *Sls. Mgr.:* Mark Diamond; *Dist. Mgr.:* Stanley M. Diamond

GALILEO ELECTRO-OPTICS CORP., Galileo Park, P.O. Box 550, Sturbridge, MA 01566, Tel: 508-347-9191, TELEX: 4999014; FSC No.: 28719; Empl.: 500

GALIL MOTION CONTROL, INC., 1054 Elwell Ct., Palo Alto, CA 94303, Tel: 415-964-6494, TELEX: 171409, FAX: 415-964-0426; Empl.: 10; *Sls. Mgr.:* Lisa Wade

GAMMA-F CORP., Electromagnetic Sciences, Inc., 3051 Fujita St., Torrance, CA 90505, Tel: 213-539-6704, TELEX: ITT 429694, FAX: 213-539-7463; FSC No.: (CAGE) 50478; Empl.: 70; *Sls. Mgr.:* Dennis L. Deck

FAX: 904-677-3039

GAMMA HIGH VOLTAGE RESCH. INC., 1096 N. U.S. Hwy, No. 1, Ormond Beach, FL 32074, Tel: 904-677-7070; Empl.: 15 ..... **D•1766-1769**

Local Sales Offices & Reps

CA	Pasadena, A-F Sls. Engrg.	213-681-5631
CA	Santa Cruz, Le Rep	408-458-0667
NJ	Nutley, Irwin Brill Sls.	201-667-0653
NM	Albuquerque, Cleveland Entprs.	505-265-7893

GAMMA SCIENTIFIC INC., 3777 Ruffin Rd., San Diego, CA 92123, Tel: 619-279-8034, TELEX: 69-7938; Empl.: 65; *Sls. Mgr.:* Robert Ruff

GANDALF DATA INC., Gandalf Technologies Inc., 1020 S. Noel Ave., Wheeling, IL 60090, Tel: 312-541-6060, 800-GANDALF, FAX: 312-541-6803; Empl.: 350; *Sls. Mgr.:* Kerry Hawkins

GANDALF TECHNOLOGIES, INC, See Gandalf Data, Inc.

GAP INSTRUMENT CORP., 40 Oser Ave., Hauppauge, NY 11788, Tel: 516-273-0909, FAX: 516-273-0948; FSC No.: 00607; Empl.: 50

GARDINER SOLDER CO., Div. of Gardiner Metal Co., 4820 S. Campbell Ave., Chicago, IL 60632, Tel: 312-847-0100, FAX: 312-847-2314; Empl.: 100; *Sls. Mgr.:* Robert Nesnidal

GAR ENTERPRISES, 2029 N. Lincoln Ave., Pasadena, CA 91103, Tel: 818-798-0785, FAX: 818-798-1466; FSC No.: 16017; Empl.: 45

GARNER GLASS CO., 177 S. Indian Hill Blvd., Claremont, CA 91711, Tel: 714-624-5071, FAX: 714-624-7212; FSC No.: 53101; Empl.: 50; *Sls. Mgr.:* Joseph C. Hyatt

GARRY ELECTRONICS, Div. of Brintec Corp., 9 Queen Anne Ct., Laghorne, PA 19047, Tel: 215-949-2300; Empl.: 100; *Sls. Mgr.:* Tom Malek; *Dist. Mgr.:* Kate Simpson

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FAX: 609-261-7300

GASKET DYNAMICS, INC., 14 King St., P.O. Box 45, Mt. Holly, NJ 08060, Tel: 609-261-8100, 800-541-2500, 215-922-6046; Empl.: 19; *Sls. Mgr.:* Edward Rosenthal; *Dist. Mgr.:* Robert LaVigne ..... **C•1618**

GASKET INTERNATIONAL INC., 49 Ackerman St., Bloomfield, NJ 07003, Tel: 201-338-6814; Empl.: 5; *Sls. Mgr.:* Russell L. Steinman

GATES, GEO. W., & CO., INC., 1209 Hempstead Tpke., Franklin Sq., NY 11010, Tel: 516-352-2904; Empl.: 10; *Sls. Mgr.:* T. E. Schulz, Jr

GATES ENERGY PRODUCTS, P.O. Box 114, Gainesville, FL 32602, Tel: 904-462-3911, TWX: 810-836-8500, FAX: 904-462-4726; Empl.: 3300; *Sls. Mgr.:* C. W. Garstang; *Dist. Mgr.:* K. Sparks ..... **D•1496-1499**

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MA	Boston, Adcour	617-784-8123
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NC	Raleigh, Engrd. Assemblies	800-950-9111
OH	Columbus, Promark	614-876-8885
TX	Houston, Kent Elctrns.	713-780-7770
TX	Houston, Southwest Elctrns.	713-240-4000
WA	Redmond, Priebe Elctrns., Inc.	206-881-2363

GAVITT WIRE & CABLE, Brookfield, MA 01506, Tel: 508-867-6476, FAX: 508-867-5126; Empl.: 75

GAYNOR ELECTRIC CO., 135 South Main St, P.O. Box 316, Thomaston, CT 06787-0316, Tel: 203-283-4388, FAX: 203-283-4107; Empl.: 50; *Sls. Mgr.:* Robert Heche; *Dist. Mgr.:* Robert Heche

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GEBEX CORPORATION, 2221 Walnut Hill Ln., Irving, TX 75038, Tel: 214-550-8955, FAX: 214-580-0173; Empl.: 35

GECO, 145 Penn St., Millheim, PA 16854, Tel: 814-349-5656, FAX: 814-349-5657; Empl.: 25

GEMINI, 103 Mensing Way, Cannon Falls, MN 55009, Tel: 507-263-3957, 800-533-3631, FAX: 507-263-5987; *Sls. Mgr.:* Gary Pearson ..... **C•1054-1055**

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AR	North Little Rock, Leo Barker Co.	501-834-2537
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CA	Victorville, Gemini Inc.	800-533-3631
CO	Broomfield, Conners Co.	303-466-9628
FL	Orlando, Gemini Inc.	800-533-3631
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IN	Noblesville, R & D Elctrns.	317-849-2026
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GENCO PRECISION CORP., 247 Skidmore Road, Deer Park, NY 11729, Tel: 516-242-3006, FAX: 516-242-3118

GENERAL AUTOMATIC CORP., See E-Tron Corp.

GENERAL BUSINESS TECH., 1891 McGaw Ave., Irvine, CA 92714, Tel: 714-261-1891, FAX: 714-261-8285; Empl.: 44; *Dist. Mgr.:* Barbara A. Foy

GENERAL CABLE CO., Fiber Optics Div., 1 Cragwood Rd., S. Plainfield, NJ 07080, Tel: 201-769-3200, TELEX: 642892; *Sls. Mgr.:* Pieter deBruijn

General Cable

FAX: 919-284-5148

GENERAL CABLE CO., 250 Overton Dr., Kenly, NC 27542, Tel: 919-284-5144; *Sls. Mgr.:* Dee Stinnette ..... **C•1855-1857**

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IL	Wheaton, Chadra-Schilke	312-653-8126
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NY	Fayetteville, Henry G. Richter, Inc.	315-637-6713
NC	Cary, Wagcon Elctrns., Inc.	919-481-1327
OH	Rocky River, Hiltebrant Indl. Sls.	216-333-5600
PA	Phoenixville, Henry G. Richter, Inc.	215-495-6176

GENERAL CHEMICAL CORPORATION, Nichols Road, Pittsburg, CA 94565, Tel: 415-685-1450, FAX: 415-458-9271

Distributor

GENERAL CONTROLS, INC., 2350 Brickvale Ave., Elk Grove Village, IL 60007, Tel: 312-595-2152 ..... 651, 784

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FAX: 317-898-2917

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FL	Deerfield Beach, J. Krutek & Assoc.	305-628-4837
FL	Maitland, J. Krutek	305-628-4837
GA	Norcross, Hughes Assocs., Inc.	404-622-1587
IL	Northbrook, Howard Benjamin	312-272-2900
IN	Noblesville, Century Elctrns.	317-849-2026
KS	Overland Pk., Thomas Dowell & Assocs.	913-648-7373
MD	Elicott City, Eastern Tech. Corp.	301-461-7720
MA	Needham Heights, Coakley, Boyd & Abbett	617-444-5470
MN	St. Paul, Northport Engrg.	612-457-8000
MS	Corinth, Hughes Assocs., Inc.	601-287-2915
MO	St. Louis, Thomas Dowell & Assocs.	314-849-4234
NJ	Mountainside, Henry G. Richter	201-233-4615
NY	Fayetteville, H.G. Richter	315-637-6713
NC	Raleigh, Hughes Assocs., Inc.	919-782-2065
OH	Cleveland, Electronic Comps., Inc.	216-331-5330
OH	Dayton, Electronic Comps., Inc.	513-866-3340
OK	Tulsa, Advance Tech. Sls.	918-664-0482
TN	Jonesboro, Hughes Assocs., Inc.	615-753-2719
TX	Austin, Advance Tech. Sls.	512-331-9979
TX	Dallas, Advance Tech. Sls.	214-340-1300
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MA	Newton, In-Stock Products Co.	617-964-6200
MO	Maryland Heights, French Gerleman Elec. Co.	314-569-3122
NJ	Atlantic Highlands, Freedom Elctrns., Inc.	201-872-2300

NY Bohemia, Car-Lac Elctrns. 516-567-4200
OH Cleveland, Car-Lac Elctrns. 216-881-0050

GENERAL DIGITAL CORP., 160 Chapel Rd, Box 1657, Manchester, CT 06040, Tel: 203-647-9700, FAX: 203-872-4681; Empl: 50

GENERAL ELECTRIC CO., Accessory Equipment Plant, 1285 Boston Ave., Bridgeport, CT 06602, Tel: 203-382-2000, TELEX: 96-4209; Empl.: 700; *Sls. Mgr.:* H. C. Wallace

GENERAL ELEC. CO., Electromaterials Dept., 1350 South Second Street, Coshocton, OH 43812, Tel: 614-622-5310, TELEX: 810-255-2921; Empl.: 600; *Sls. Mgr.:* D.E. Allen

GENERAL ELECTRIC CO., Instrument Prods. Section, See Yokogawa Corp. of America

GE MICROELECTRONICS CENTER, GE Aerospace, P.O. Box 13049, Research Triangle Park, NC 27709, Tel: 919-549-3100, FAX: 919-549-3598; FSC No.: 1HL38; Empl.: 400; *Sls. Mgr.:* Donald B. Dickerman, Jr.

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GENERAL HARDWARE MFG., 80 White St., New York, NY 10013, Tel: 212-431-6100, FAX: 212-431-6499; *Sls. Mgr.:* Tom McGannon

GENERAL INDUSTRIES, Taylor & Olive St., Elyria, OH 44035, Tel: 216-323-3136, FAX: 216-323-4017; Empl.: 1000

GENERAL INSTRUMENT, Govt. Systems, 600 W. John St., C. S. 710, Hicksville, NY 11802-0709, Tel: 516-933-3000, TELEX: 311512, TWX: 510-221-1865, FAX: 516-933-3432; Empl.: 768; *Sls. Mgr.:* A. Heckler/C. Turner

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FL Bradenton, Saber Assocs. 800-432-6288
FL Coral Springs, Saber Assocs. 800-432-6288
FL Melbourne, Saber Assocs. 800-432-6288
FL Palm Bch., Saber Assocs. 800-432-6288
GA Atlanta, Saber Assocs. 800-327-0853
IL Mt. Prospect, Cain Forlaw 312-253-3578
MA Billerica, Microwave Mktg. Specialists 508-667-1440
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NY Rochester, TCS (Technical Comp. Sls.) 716-342-2406
NC Clayton, Saber Assocs. 800-327-0853
OH Lancaster, Cain Forlaw 614-654-4800
TX Dallas, Cain & Co. 214-247-3901

GENERAL NUMERIC CORPORATION, 390 Kent Avenue, Elk Grove Village, IL 60007, Tel: 312-640-1595, TELEX: 210036, FAX: 312-228-5490; Empl.: 125; *Sls. Mgr.:* James Scott

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FAX: 203-481-8937

GENERAL RESISTANCE, A Prime Technology Company, Twin Lakes Rd., P.O. Box 185, N. Branford, CT 06471, Tel: 203-481-5721, TWX: 710-452-3092; FSC No.: 05591; Empl.: 60; *Sls. Mgr.:* J. L. Jamiesen ..... **A•1950; D•1274-1275**

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IA Marion, Marsland Assocs., Inc. 319-373-0566
PA Bensalem, Electra-Tech 215-245-7455
TX Arlington, SESCO, Inc. 214-231-9364
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EXP Rajajinagar, Banaglore, Elctrns. Continental ... 366665

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CA San Diego, Saber Entrps. 619-271-1523
CO Littleton, Radco 303-794-4279
CT Cheshire, MECO, Inc. 617-944-6660
GA Altanta, SESCO 404-458-6423
IL Des Plaines, Marsland Assocs. 312-298-2620
LA Baton Rouge, SESCO 512-892-2490
MD Joppa, Electra-Tech 301-877-0344
MA Reading, MECO, Inc. 617-944-6660
MN Minneapolis, Marsland Assocs. 612-545-4481
MO St. Louis, Marsland Assocs. 314-991-1399
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NM Albuquerque, Qualtech 505-243-5605
NY Rochester, TAE-REP, Inc. 716-586-8710
NY Schenectady, Tae-Rep, Inc. 607-692-3705
NY Whitney Point, TAE-REP, Inc. 607-692-3705
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OH Stow, Rixan Assocs. 216-686-2909
OK Broken Arrow, SESCO 918-622-3868
TN Hixson, SESCO, Inc. 615-588-5455
TX Austin, SESCO 512-892-2490
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TX Richardson, SESCO 214-231-9364
VA Dumfries, Electra-Tech 703-670-6962
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WI New Berlin, Marsland Assocs. 414-786-6611

Components

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MD Randallstown, Beacon North, Inc. 703-478-2480
MI Farmington, W. R. Hummon & Assoc. 313-474-0661
OH Dayton, RIXAN Assocs. 513-278-4216
OH Stow, Rixan Assocs. 216-686-2909
TX Dallas, Blackburn Assocs. 214-750-8927
TX Houston, Blackburn Assocs. 713-463-1354
UT Salt Lake City, J. F. Hurlbut Co. 801-531-7472
VA Sterling, Beacon North, Inc. 703-478-2480

Local Distributors

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GENERAL SEMICONDUCTOR IND., INC., Square D Company, 2001 W. 10 Pl, Tempe, AZ 85281, Tel: 602-968-3101, TWX: 910-950-1942, FAX: 602-966-6396; FSC No.: 24444;19500; Empl.: 625; *Sls. Mgr.:* William Hennigan; *Dist. Mgr.:* William Hennigan

Local Distributors

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CA Garden Grove, Bell Inds. 714-220-0681
CA Gardena, Bell Inds. 213-515-1800
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CA Rocklin, Bell Inds. 916-652-0414
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CA San Diego, Future Elctrns. 619-278-5020
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CA San Jose, Future Elctrns. 408-434-1114
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CA Thousand Oaks, Bell Inds. 805-499-6821
CA Torrance, All American Transistor 213-320-0240
CA Yorba Linda, Zeus Comps. 714-921-9000
CO Westminster, Future Elctrns. 303-421-0123
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GA Norcross, Hammond Elctrns. 404-449-1996
GA Norcross, Pioneer-Technol. 404-448-1711
IL Elk Grove Village, Bell Inds. 312-640-1910
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IN Indianapolis, Bell/Graham Elctrns. 317-875-8200
IN Indianapolis, Pioneer-Standard 317-849-7300
KS Lenexa, Pioneer-Standard 913-492-0550
MD Gaithersburg, Pioneer-Technol. 301-921-0660
MD Rockville, All American Transistor 301-251-1205
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MO Kansas City, LCOMP 816-221-2400
MO Maryland Hgts., LCOMP 314-291-6200
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NJ W. Berlin, GCI 609-768-6767
NM Albuquerque, Bell Inds. 505-292-2700
NY Binghamton, Pioneer-Electr. 607-722-9300
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NC Charlotte, Pioneer-Technol. 704-527-8188
NC Greensboro, Hammond Elctrns. 919-275-6391
NC Raleigh, Century Electr. 919-782-2116
OH Cincinnati, Schuster Electr. 513-489-1400
OH Cleveland, Pioneer-Standard 216-587-3600
OH Columbus, Electronic Mktg. Corp. 914-299-4167
OH Dayton, Pioneer-Standard 513-236-9900
OH Highland Hgts., Electronic Mktg. Corp. 216-442-3441
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Can Winnepeg, Manitoba, Zentronics 204-694-1957

GENERAL TECHNOLOGY CORP., 6816 Washington Avenue, NE, Albuquerque, NM 87109, Tel: 505-345-5591, FAX: 505-344-3227; Empl.: 105; *Sls. Mgr.:* Ralph H. Anderson

GENERAL TRANSISTOR CORP., 216 W. Florence Av., Inglewood, CA 90301, Tel: 213-673-8422, TELEX: 653474, FAX: 213-672-2905; FSC No.: 1P738; Empl.: 39; *Sls. Mgr.:* Al Barrios

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GENICOM CORP., 1 Genicom Dr., Waynesboro, VA 22980, Tel: 703-949-1471, TWX: 710-839-0407; FSC No.: 01526; Empl.: 2300; *Sls. Mgr.:* W. O. Bare ..... **B•1488-1491**

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Can Nepean, Ont., Genicom Corp. 613-726-0215

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FL Orlando, T & T Prods., Inc. 305-857-2282
MD Towson, Electronic Comp. Sls. 800-638-4221
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NC Charlotte, Electronics Mktg. Corp. 704-394-6195
OH Cleveland, Electronics Mktg. Corp. 216-442-3441
OH Columbus, Electronics Mktg. Corp. 614-299-4161
OH Dayton, Elctrns Mktg. Corp. 513-278-5745
OH Highland Heights, Electronics Mktg. Corp. 216-442-3441
TX Dallas, Associated Aircraft Supp. Co. .. 214-331-4381
WA Redmond, Pan Pacific Elctrns., Inc. 206-881-7252

GENISCO MEMORY PRODS. CORP., 10874 Hope St., Cypress, CA 90630, Tel: 714-220-0720, TWX: 910-347-6773, FAX: 714-952-1932; FSC No.: 96682; Empl.: 248; *Sls. Mgr.:* John Krill

GENISCO TECHNOLOGY CORP., 14930 E. Alondra Blvd., La Mirada, CA 90638, Tel: 714-523-7001, TWX: 910-346-6773, FAX: 714-522-1058; FSC No.: 07249; Empl.: 450; *Sls. Mgr.:* Rita Deidrich

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GENSTAR RENTAL ELECTRONICS, INC., 6307 De Soto Ave., Suite J, Woodland Hills, CA 91367, Tel: 800-331-3440 (in CA), 800-227-8409, FAX: 818-715-9249 ..... **D•1277**

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GETTYS, an AEG Company, 2701 N. Green Bay Rd., Racine, WI 53404, Tel: 414-637-6591, TELEX: 201-309, FAX: 414-637-8400; Empl.: 189; *Sls. Mgr.:* Ron Haenze, VP of Mktg./Sls.

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GIANNINI INSTITUTE, 51-555 Madison St., Indio, CA 92201, Tel: 619-347-2833, FAX: 619-342-4006; FSC No.: 24727; Empl.: 10; *Sls. Mgr.:* John Phillips

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Gilway Technical Lamp

FAX: 617-938-5867

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GIMIX, INC., 1337 W. 37th Place, Chicago, IL 60609, Tel: 312-927-5510, FAX: 312-927-7352; Empl.: 14; *Sls. Mgr.:* Richard Don

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GLOBAL SPECIALTIES, Interplex Electronics, Inc., 70 Fulton Terrace, P.O. Box 1942, New Haven, CT 06509, Tel: 203-624-3103, FAX: 203-468-0060; Empl.: 70; *Sls. Mgr.:* Dan Marley

GLOBAL TECHNOLOGY INTERNATIONAL, INC., 917-134th Street S.W., Everett, WA 98204, Tel: 206-742-9111, ESYLNK: 759633, FAX: 206-743-7420; Empl.: 61; *Sls. Mgr.:* Ruskin A. Whaley, V.P. Sls. & Mktg.

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GLOBE MOTORS, 2275 Stanley Avenue, Dayton, OH 45404, Tel: 513-228-3171, TELEX: 288-224, TWX: 810-459-1642, FAX: 513-229-8531; Empl.: 580; *Sls. Mgr.:* Bill Pelfrey; *Dist. Mgr.:* Tom Coyle

GLOBE PLASTICS, 1342 S. Signal Dr., Pomona, CA 91766, Tel: 714-623-2747; FSC No.: 21071; Empl.: 23; *Sls. Mgr.:* J. R. Humphreys

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GLOBTEK, INC., 7700 Marine Rd., N. Bergen, NJ 07047, Tel: 201-861-0246, TELEX: 755579; Empl.: 20; *Sls. Mgr.:* Frank Albano; *Dist. Mgr.:* Robert McCarty .... **A•1668-1669, 2303; B•1369, 1493; C•1369, 1859; D•1784-1785**

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GMR CO., 8801 Sepulveda Blvd., Los Angeles, CA 90045, Tel: 213-216-9516, TELEX: 499 2468; Empl.: 93; *Sls. Mgr.:* Harvey Mushman

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NJ	Wayne, Breen Assocs	201-696-8683
NY	Syracuse, Northeastern Elctrns., Inc.	315-455-7561
OR	Beaverton, Core II Mktg	503-641-0877
UT	Bountiful, Duven Assocs	801-295-0353

GOOD-ALL ELECTRIC, INC., 3725 Canal Drive, Fort Collins, CO 80524, Tel: 303-484-3080, 800-826-7891, TWX: 910-930-9015, FAX: 303-484-8649; FSC No.: 22096; Empl.: 100; *Sls. Mgr.:* David J. Wilkening

GORDON CO.:WATLOW, 5710 Kenosha St., Richmond, IL 60071, Tel: 815-678-2211, TELEX: 72-2427, FAX: 815-678-3961; Empl.: 300

GORDON, L., PACKAGING, 1050 S. Paca St., Baltimore, MD 21230, Tel: 301-539-6537, FAX: 301-625-7510; Empl.: 150

GORDON PRODUCTS, 67 Del Mar Dr., Brookfield, CT 06804, Tel: 203-775-4501; Empl.: 45; *Sls. Mgr.:* Leon Najman; *Dist. Mgr.:* Leon Najman

GORDOS

FAX: 501-636-2305

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FL	Tampa, Florida Comps., Inc.	813-960-7044
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IN	Indianapolis, Hy-Tek Sls. Co.	317-887-2564
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MA	Wilmington, Anacon Sls. Assocs.	617-270-3712
MI	Troy, Pyramid Integrated Control Sys.	313-362-5375
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NJ	Budd Lake, Guido Assocs.	201-347-4643
NJ	Lawrenceville, DVS Co.	609-896-1112
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OH	Shaker Hgts., Omega Sls., Inc.	216-751-9600
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OR	Beaverton, Venture Elctrns., Inc.	503-626-7418
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TX	Houston, Advanced Tech. Sls.	613-440-3888
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EXP	AZ/Rogers, Gordos	501-636-5000

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CA	San Jose, Integrated Elctrns.	408-435-1000
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CA	Torrance, Time Elctrns.	213-320-0880
CO	Denver, Bell	303-424-1985
CO	Denver, Integrated Elctrns.	303-292-6121
CO	Englewood, Time Elctrns.	303-799-8851
CO	Westminster, Future	303-650-0123
CT	Bethel, Future Elctrns.	203-743-9594
CT	Cheshire, Time Elctrns.	203-271-3200
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FL	Clearwater, Future	813-578-2770
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FL	Ft. Lauderdale, Hammond	305-973-7103
FL	Ft. Lauderdale, Time Elctrns.	305-974-4800
FL	Lakeland, AA Elec.	813-665-6911
FL	Miami, Sesco	305-832-0770
FL	Orlando, Future	305-767-8414
FL	Orlando, Hammond	305-849-6060
FL	Orlando, Time Elctrns.	305-841-6565
FL	St. Petersburg, Sesco	813-576-6991
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KS	Wichita, L Comp	316-265-8501
LA	Baton Rouge, Sesco	504-928-4951
LA	New Orleans, Currier & Roser	504-734-1147
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NY	Syracuse, Time Elctrns.	315-432-1355
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VA	Roanoke, Virginia Control Equip. Co.	703-342-6927
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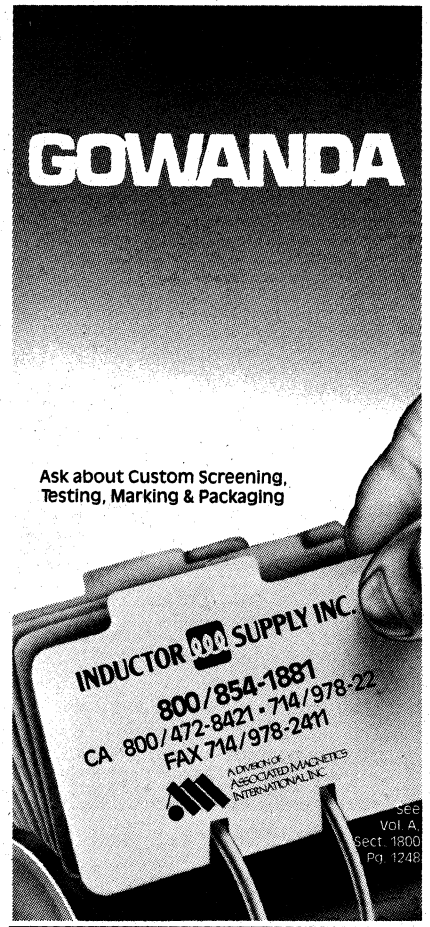
Can	Orlando, Time Elctms.	305-841-6565
Can	Ottawa, Ont., Future Elctms.	613-820-8313
Can	Rexdale, Ont., Newark	416-675-4555
Can	St. Laurent, Que., Zanin Elctms.	514-342-6211
Can	Toronto, Ont., Future Elctms.	416-638-4771
Can	Vancouver, B.C., Future Elctms.	604-294-1166



Can	Winnipeg, Manitoba, Future Elctms.	204-339-0554
Can	Winnipeg, Manitoba, Saynor Varah	204-633-6190

W. L. GORE & ASSOCS., INC., 4747 E. Beautiful Lane P.O. Box 50699, Phoenix, AZ 85076, Tel: 602-526-1290, TWX: 910-972-0969; FSC No.: 60622

W. L. GORE & ASSOCS., 555 Paper Mill Rd., Newark, DE 19714, Tel: 302-738-4880, TWX: 510-666-0825; Empl.: 2000; *Sls. Mgr.:* Daniel D. Johnson

GORMAN MACHINE CORP., 7 Burke Dr., Brockton, MA 02401, Tel: 508-588-2900, TWX: 710-345-0679, FAX: 508-588-9560; Empl.: 25; *Sls. Mgr.:* Kenneth P. Gorman

GORMAN-REDLICH MFG. CO., 257 W. Union St., Athens, OH 45701, Tel: 614-593-3150; Empl.: 4; *Sls. Mgr.:* Jim Gorman

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Local Sales Offices & Reps

CA	Hayward, Pacific Mktg., Inc.	415-887-1620
CA	Northridge, Myco Sls.	818-886-7101
CA	San Diego, Hadden Assocs., Inc.	619-565-9444
CO	Boulder, R.F. Mayo Assocs.	303-422-2155
FL	Longwood, Sam Reps.	407-869-9565
IL	Highland Park, Bransky Sls.	312-433-2375
IN	Greenfield, France Entprs.	317-462-6098
MA	Waltham, Powercard Corp.	617-890-6789
TX	Irving, Kite Elctm. Sls.	214-986-0321
VA	Arlington, Gans & Pugh Assocs.	703-527-3262

GOULD INC., POWER CONVERSION DIV., See RTE Deltic Corporation 4c

GOULD INC., Recording Systems Division, 3631 Perkins Avenue, Cleveland, OH 44114, Tel: 216-361-3315, TELEX: 196113GLD RS UT; FSC No.: 96795; Empl.: 550 ..... **D•1439**

Local Sales Offices & Reps

AZ	Phoenix, Gould Inc., T&M Sls./Svc.	602-990-8212
CA	Los Angeles, Gould Inc., T&M Sls./Svc.	213-404-1919
CA	San Francisco, Gould Inc., T&M Sls./Svc.	408-864-7733
CO	Denver, Gould Inc., T&M Sls./Svc.	303-741-4600
DC	Washington, Gould Inc., T&M Sls./Svc.	301-345-0050
FL	Orlando, Gould Inc., T&M Sls./Svc.	305-830-0695
GA	Atlanta, Gould Inc., T&M Sls./Svc.	404-279-1652
HI	Honolulu, Hawaiian Industrial Instr.	808-533-4232
IL	Chicago, Gould Inc., T&M Sls./Svc.	312-640-4135
MA	Boston, Gould Inc., T&M Sls./Svc.	617-938-0133
MI	Detroit, Gould Inc.,T&M Sls./Svc.	313-588-4020
MN	Minneapolis, Gould Inc., T&M Sls./Svc.	612-544-5253
NJ	New York Metro, Gould Inc., T&M Sls./Svc.	201-935-1717
NM	Albuquerque, Gould Inc., T&M Sls./Svc.	505-292-4063
NC	Greensboro, Gould Inc., T&M Sls./Svc.	919-275-1078
OH	Cleveland, Gould Inc., T&M Sls./Svc.	216-361-3315
OH	Dayton, Gould Inc., T&M Sls./Svc.	513-433-9586
PA	Pittsburgh, Gould Inc., T&M Sls./Svc.	412-838-7700
TX	Dallas, Gould Inc., T&M Sls./Svc. Div.	214-991-8229
TX	Houston, Gould Inc., T&M Sls./Svc.	713-680-1121
WA	Seattle, Gould Inc., T&M Sls./Svc.	206-882-7525

GOULD INC., Semiconductor Division, 2300 Buckskin Rd., Pocatello, ID 83201, Tel: 208-233-4690, TWX: 910-977-5752; Empl.: 1500; *Dist. Mgr.:* Richard Brown

GOULD INC., Test & Measurement, 19050 Pruneridge Ave., Cupertino, CA 95014-0718, Tel: 800-Gould-10, FAX: 408-988-1647; *Sls. Mgr.:* Dan Cockcroft

GOULD SHAWMUT, 374 Merrimac St., Newburyport, MA 01950, Tel: 508-462-6662/3131, FAX: 508-465-6419; FSC No.: 71424; *Sls. Mgr.:* Malcolm Allison

Local Sales Offices & Reps

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AZ	Scottsdale, Mahaffey & Assocs.	602-991-9790
CA	Concord, G & R Sales	415-827-1727
CA	Costa Mesa, Dennis Don & Assocs.	714-957-0844
CO	Denver, Intelligent Control Dvcs.	303-460-9699
GA	Atlanta, Berry-Elsberry Co.	404-355-9296
HI	Honolulu, West Pacific Agy.	808-836-2088
ID	Boise, Idaho Elec. Sls.	208-375-3116
IL	Addison, McBud, Inc.	312-628-8570
IN	Indianapolis, Andrew J. Falcone	317-685-1171
IA	Cedar Rapids, Joe Bertsch Elctrl. Sls.	319-395-9220
KS	Prairie Village, George H. Pearson Co.	913-362-4442
KY	Louisville, Pfeiffer Sls. Co.	502-634-8314
LA	Mandeville, Griffith-Herron-Richard Co.	504-626-8516
MD	Owings Mills, Specialty Electrical Sls. Co.	301-356-7700
MI	Madison Hgts., Electrocom Div. of Hesco	313-546-7750
MN	Minneapolis, LESCO, Inc.	612-542-8242
MO	St. Louis, George H. Pearson Co.	314-822-4080
MT	Billings, Control Technig. Co.	406-259-4597
NH	Laconia, Raymon Gerard Assocs.	603-524-6005
NJ	Union, Tri-Tech Assoc.	201-851-0370
NY	No. Syracuse, Lachut Electrical Sls.	315-458-6486
NC	Greensboro, Electra-Tek Carolinas	919-272-8254
OH	Cleveland, Electro-Specialties	216-447-3048
OK	Oklahoma City, P. & C. Sales Co.	405-745-3431
OR	Portland, Barry P. McGlew	503-224-5030
PA	Pittsburgh, Madia-Paul & Assocs.	412-331-3121
TN	Germantown, Talley & Talley Assocs.	901-755-3130
TN	Hendersonville, Lasley & Assocs.	615-822-7773
TX	Houston, E-Tel Sls., Inc.	713-678-4460
TX	Richardson, Tubbesing Sls. Corp.	214-234-3855
UT	Salt Lake City, Anderson Elctrl. Sls.	801-486-0666
WA	Redmond, Richard D. Shea	206-451-3772
WI	Milwaukee, D. S. Berry Co.	414-224-0680

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AL	Huntsville, L&D, Inc.	205-837-1469
AZ	Mesa, Sys. Sls. of AZ Inc.	602-829-9338
CA	Buena Pk., Orion-Eclipse	714-522-6310
CA	Fremont, William Parks Assocs.	415-796-0875
CA	Fremont, William Parks Assocs.	415-770-9058
CA	San Diego, Earle & Assocs.	619-278-5441
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IA	Cedar Rapids, Snider Sls. Co.	319-362-4410
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MI	Southfield, Fred H. Gehrke & Assocs.	313-559-5363
MN	Chanhassen, Barnes Sls. Assocs.	612-934-2907
NJ	Whippany, Robert Smith Assocs.	201-540-0204
NY	Morrisville, Naylor Electric	315-684-9620
NY	Plainview, Robert Smith Assocs.	516-681-3155
NC	Raleigh, L & D, Inc.	919-876-5301
OH	Cincinnati, Stegman Blaine Mktg.	513-729-1969
OH	Cleveland, Stegman Blaine Mktg.	216-572-0003
PA	Exton, Linear Sls.	215-524-9080
TX	Dallas, Scanlon, Hughes & Assocs.	214-739-2888
WA	Olympia, Bergford & Assocs.	206-866-2001
Can	St. Laurent, Componetics	514-334-1464

Local Distributors

CA	Hayward, KEA Elctms.	415-887-2900
CA	Huntington Beach, Inductor Supp.	714-891-4524
CA	Stanton, Inductive Comps. & Crystal	714-828-4320
CT	Bridgeport, Park Distributors	203-366-7200
MN	Chanhassen, G&F Distribution	612-934-2907
NY	Hauppauge, Broadline Electric	516-231-4100

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GRALEX INDUSTRIES, 155 Wildey St., Tarrytown, NY 10591, Tel: 914-631-2978, FAX: 914-631-0862; FSC No.: 11332; Empl.: 15 ..... **D•1397**

Local Sales Offices & Reps

CT Bridgeport, Gralex Inds., Inc. 203-334-7363
NY Tarrytown, Gralex Inds., Inc. 914-631-2978

Local Distributors

AZ Phoenix, Metermaster 602-243-4111
CA Los Angeles, Metermaster 213-685-4340
CA Palo Alto, Metermaster 415-968-0313
CA San Diego, Metermaster 619-560-4841
GA Atlanta, Metermaster 404-446-0166
IL Chicago, Metermaster 312-593-8650
MA Billerica, Electra Test, Inc. 617-667-8541
MA Boston, Calibron 617-894-6440
NJ S. Hackensack, Concord Elctrns. 201-488-0008, 1-800-222-1298
NY Great Neck, Instr. Mart Inc. 516-487-7430
OH Cleveland, Metermaster 216-651-4100
TX Dallas, Metermaster 214-271-5671

GRAND TRANSFORMERS, 1500 Marion St., Grand Haven, MI 49417, Tel: 616-842-5430; Empl.: 125; *Sls. Mgr.:* G. V. Retzlaff

GRANT HARDWARE CO., A Mobex Company, High Street, West Nyack, NY 10994, Tel: 914-358-4400, FAX: 914-358-1703; FSC No.: 83508; Empl.: 490; *Sls. Mgr.:* Tony DiSantis

GRAPHITE METALLIZING CORP., 1036 Nepperhan Ave., P.O. Box 110, Yonkers, NY 10702, Tel: 914-968-8400, TELEX: 13-1571, FAX: 914-968-8468; Empl.: 178; *Sls. Mgr.:* E. Walker ..... **B•1252**

Local Sales Offices & Reps

OR Beaverton, Graphite Metallizing 503-646-9964

GRASSLIN CONTROLS CORP.:GRASSLIN GMBH & CO., K.G., 45 Spear Rd., Ramsey, NJ 07446, Tel: 201-825-9696, FAX: 201-825-8694; Empl.: 5

GRAYHILL INC., 561 Hillgrove Ave., La Grange, IL 60525, Tel: 708-354-1040, TELEX: 6871375 GHLG UW, TWX: 910-683-1850, FAX: 708-354-2820; FSC No.: 5930; Empl.: 1000; *Sls. Mgr.:* Richard K. Neumann; *Dist. Mgr.:* Robert J. Ferrel ..... **B•1510-1511, 1743-1749, 1864-1865; C•1371**

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AL Huntsville, Rep, Inc. 205-881-9270
AZ Phoenix, Mercury Engrg. Sls. 602-265-0344
CA Anaheim, Impact Elctrns. 714-533-1351
CA Cupertino, West-Comp, Inc. 408-245-3100
CA San Diego, Earle Assocs. 619-278-5441
CO Denver, Lindberg Co. 303-758-9033
FL Winter Springs, Sunland Assocs. 407-365-9533
GA Tucker, Rep, Inc. 404-938-4358
IL Itasca, LTD Elctrns. 312-773-2900
IN Ft. Wayne, Menze Sls. 219-747-5616
IA Cedar Rapids, Lorenz Sls. 319-377-4666
KS Overland Pk., Spectrum Sls. 913-648-6811
MD Gaithersburg, Naudain Assocs. Southern 301-258-5040
MA Needham Hgts., Newscott Co. 617-444-1923
MI Royal Oak, Hilltronics Inc. 313-435-0920
MN S. St. Paul, Northport Engrg. 612-457-8000
MO Hazelwood, Spectrum Sls. 314-731-5151
NE Lincoln, Lorenz Sls., Inc. 402-475-4660
NJ Marlton, Naudain Assocs. 609-983-5300
NM Albuquerque, Lindberg Co. 505-881-1006
NY Great Neck, Coakley Boyd Abbett/Tylinski 516-466-9070
NY Ithaca, Bob Dean, Inc. 607-257-1111
NY Wappingers Falls, Bob Dean, Inc. 914-297-6406
NC Charlotte, R. W. Chapman & Co. 704-525-2421
NC Raleigh, R. W. Chapman 919-782-2624
OR Tigard, Eltech, Inc. 503-684-3458
PA Pittsburgh, Bear Mktg. 412-531-2002
SC Greenville, Robert W. Chapman & Co. 803-288-8821
TN Jefferson City, Rep, Inc. 615-475-9012
TX Austin, W. Pat Fralia Co. 512-835-7911
TX Euless, W. Pat Fralia Co. 817-267-3577
TX Houston, W. Pat Fralia Co. 713-772-1572
UT Salt Lake City, Lindberg Co. 801-277-2643
WA Bellevue, Eltech, Inc. 206-643-4330
WI Mequon, Badgerep 414-241-9200
Can Pickering, Ont., A. C. Simmonds & Sons Ltd. 416-839-8041

Local Distributors

AL Huntsville, Powell Elctrns. 205-539-2731
AZ Phoenix, Sterling Elctrns. 602-268-2121
AZ Tempe, D C Elctrns. 602-438-1234
AZ Tempe, Harper SID 602-967-1464
AR Little Rock, Carlton-Bates Co. 501-562-9100
CA Compton, Harper SID 213-979-5090
CA Garden Grove, Richey/Impact 714-895-0060
CA Gardena, Calif. Switch 213-770-2330
CA Los Angeles, Electric Switches 213-660-1310
CA Riverside, Electronic Supp. 714-683-7300
CA San Diego, Electronic Supply 619-693-8222
CA San Diego, Harper S.I.D. 619-578-2500
CA San Diego, Richey/Impact Elctrns. 619-271-4511
CA San Jose, Harper SID 408-943-9490
CA San Jose, Powell Elctrns. 408-943-9020
CA San Jose, Richey/Impact Elctrns. 408-432-7100
CA Santa Clara, Cypress Elctrns. 408-980-2500
CA Santa Monica, Master Distributors 213-452-1229
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CO Denver, Newark Elctrns. 303-757-3351
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IL Chicago, Waldom Elctrns. 312-585-1212
IL Northbrook, Classic Comp. Supp. 312-272-9650
IL Palatine, Ohm Elctrn. 312-359-5500
IL Peoria, Klaus Radio 309-691-4840
IL Wood Dale, NEP Elctrns. 312-595-8500
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IN Fort Wayne, Bell Inds./Graham Div. 219-423-3422
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MI Livonia, R.S. Elctrns. 313-525-1155
MI Oak Park, Newark/Detroit Elctrns. 313-967-0600
MI St. Clair Shores, Spemco 313-771-2700
MN Minneapolis, Newark Elec. 612-331-6350
MN Minneapolis, Sterling Elctrns. 612-831-2666
MN St. Paul, Gopher Elctrns. 612-483-3322
MO Kansas City, LComp, Inc. 816-221-2400
MO Maryland Hgts., LComp, Inc. 314-291-6200
MO St. Charles, Finnigan Elctrns., Inc. 314-946-6201
NE Lincoln, Scott Elctrns. 402-466-8221
NH Nashua, Brevan Elctrns. 603-889-7230
NJ East Hanover, State Elec. 201-887-2550
NJ Kenilworth, Federated Purch. 201-272-0505
NJ West Berlin, General Comps. 609-768-6767
NM Albuquerque, Walker Elctrn. Supp. 505-883-2992
NY Binghamton, Pioneer Elctrns. 607-722-9300
NY Bohemia, Car-Lac Elctrns. 516-567-4200
NY Buffalo, Summit Distrs. 716-887-2800
NY Hauppauge, Sager Elctrns. 516-348-1300
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NY Lynbrook, Peerless Radio 516-593-2121
NY Rochester, Simcona Elctrns. 716-328-3230
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NC Cary, Powell Elec. 919-467-1212
NC Greensboro, Hammond Elctrns. 919-275-6391
NC Raleigh, Sager/Svc. 919-850-9550
OH Cincinnati, URI Elctrns. 513-761-4030
OH Cleveland, Pioneer/Cleveland 216-587-3600
OH Columbus, Hughes-Peters 614-294-5351
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OH Dayton, Stotts-Friedman 513-298-5555
OH Willoughby, Gateway Megatech 216-953-0330
OK Oklahoma City, Electro Entprs. 405-427-6591
OK Tulsa, Norvell 918-254-8606
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OR Portland, Radar Elec. Co. 503-232-3404
PA Harrisburg, Cumberland Elctrns. 717-232-5999
PA Mars, Almo Elctrns., Inc. 412-931-5990
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PA Philadelphia, Almo Elctrns. 215-698-4000
PA Philadelphia, Powell Elctrns. 215-365-1900
PA Pittsburgh, Pioneer/Pittsburgh 412-782-2300
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SC Columbia, Dixie Elctrns. 803-779-5332
SC Greenville, EMSCO 803-233-4121
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TX Dallas, Associated Aircraft 214-331-4381
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TX Dallas, Norvell Elctrns. 214-233-0020
TX Ft. Worth, Allied Elctrns. 817-336-5401
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WI Milwaukee, Marsh Elctrns. 414-475-6000
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GREEN ENGINEERING, 78 Stone Place, Melrose, MA 02176, Tel: 617-665-8994, FAX: 617-665-8255; Empl.: 5

GREENLEE TEXTRON INC.:SUBSIDIARY OF TEXTRON INC., 4455 Boeing Drive, Rockford, IL 61109, Tel: 815-397-7070, TELEX: 433-0029GTCRKD; *Sls. Mgr.:* J. Angel, V.P.

GREENRAY INDS., INC., 840 W. Church Rd., Mechanicsburg, PA 17055, Tel: 717-766-0223, TWX: 510-650-4939, FAX: 717-790-9509; FSC No.: 16681; Empl.: 55

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GREIBACH INSTRUMENTS DIV., 25 Dock St., Mt. Vernon, NY 10550, Tel: 914-699-9717, FAX: 914-699-9410; FSC No.: 32590; Empl.: 35

Local Sales Offices & Reps

IL Lincolnwood, Saffro & Assocs. 312-677-9722
MN Minneapolis, Hei-Lite Sls. 612-861-6051
WI Lake Mills, Saffro & Assocs. 1-800-327-0312

THE GRIEVE CORPORATION, 500 Hart Rd., Round Lake, IL 60073-9989, Tel: 312-546-8225, FAX: 312-546-9210; *Sls. Mgr.:* Frank Calabrese

FAX: 609-261-0921

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•
(415) 835-1500
1026 6th Avenue, Oakland, CA 94606

GSI

FAX: 301-561-1768

GSI CORP., 1917 Greenspring Dr., Timonium, MD 21093, Tel: 301-252-1768, TELEX: 292319 GSIC UR; FSC No.: 60990; Empl.: 50 ..... **C•1860-1862**

Local Sales Offices & Reps

AZ	Tempe, Elctrn. Dev. & Sls.	602-438-1547
CA	El Toro, PAR Mktg.	714-768-6021
CA	San Jose, Norcal Repco	408-294-1999
CT	Madison, Omni-Rep	203-421-4561
IL	Crystal Lake, J. D. Noble & Assocs., Inc.	815-455-5084
MD	Poolesville, Westerly Assocs. Inc.	301-972-8176
MA	Burlington, Omni-Rep	617-245-4511
MN	Bloomington, Paul Ericson & Assocs.	612-831-5016
NJ	Ho-Ho-Kus, D. J. Fisher Co., Inc.	201-652-0090
NY	Camillus, Cichy & Cichy Sls.	315-488-3526
RI	Cumberland, Omni-Rep	401-333-2353
TX	Irving, Elctrn. Dev. & Sls.	214-570-5122

GTE CORP., Sylvania Emissive Prods./Process Heat, Portsmouth Ave., Exeter, NH 03833, Tel: 603-772-4331, TWX: 510-294-4471; Empl.: 200

GTE FIBEROPTIC PRODUCTS, 2401 Reach Rd., Williamsport, PA 17701, Tel: 717-326-6591, 1-800-FBR-OPTICS

GTE GOVERNMENT SYSTEMS CORP., P.O. Box 7188, Mountain View, CA 94039, Tel: 415-966-2000, TWX: 910-379-6948, FAX: 415-966-2303; Empl.: 3200; *Sls. Mgr.:* Evan S. Baker; *Dist. Mgr.:* Evan S. Baker

GTE MICROCIRCUITS, 2000 W. 14th. St., Tempe, AZ 85281, Tel: 602-968-4431, TWX: 910-951-1383; FSC No.: 16766; Empl.: 400; *Sls. Mgr.:* Jim Kelley

GTE PRODUCTS CORP., 2401 Reach Rd., Williamsport, PA 17701, Tel: 717-326-6591, TWX: 510-655-5539; *Sls. Mgr.:* Robert Fillnow

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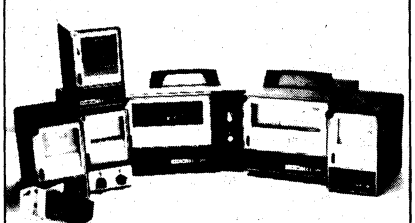

1810 Grant Avenue
Philadelphia, PA 19115
215-673-5600
FAX: 215-673-5609
800-343-1199
THE ULTIMATE TECHNICAL SOURCE

GTE PRODUCTS, Circuit Board Operation, Old Route 220, P.O. Box 360, Muncy, PA 17756, Tel: 717-546-3191; *Sls. Mgr.:* Rex Green

GTE PRODUCTS CORPORATION, Miniature Lighting Products, West Main Street, Hillsboro, NH 03244, Tel: 603-464-5533, 603-464-5538

GTE PRODUCTS GRP. (SYLVANIA), See Sylvania Miniature Lighting

GTE SUPPLY, GTE Communications Systems, 5225 Wiley Post Way, Salt Lake City, UT 84116, Tel: 800-433-4837; Empl.: 1300

GTE SWITCHING & TELEPHONE PRODUCTS, 400 N. Wolf Rd., Northlake, IL 60164, Tel: 312-681-7100

GTE SYLVANIA LIGHTING, Sylvania Lighting Center, 100 Endicott St., Danvers, MA 01923, Tel: 617-777-1900

GTE SYLVANIA, INC., STANDISH, ME, See Sylvania Control Devices

GTI/CIRCUITS DIV., Box 217, Leesburg, IN 46538, Tel: 219-453-3261, TELEX: 023-2653, FAX: 219-453-3833; Empl.: 150; *Sls. Mgr.:* Hugh M. Walker

GTI/ELECTRONICS DIV., P.O. Box 2096, Hadley, PA 16130, Tel: 412-253-3161, FAX: 412-253-3853; Empl.: 180; *Sls. Mgr.:* Richard C. Kaufman

GUARDIAN ELEC. MFG. CO., 1550 W. Carroll Ave., Chicago, IL 60607, Tel: 815-337-0050, FAX: 815-337-0377; Empl.: 500; *Sls. Mgr.:* John Cotton; *Dist. Mgr.:* Mac Rowell

GUILDLINE INSTRUMENTS, 4403 Vineland Rd, Suite B-10, Orlando, FL 32811-7335, Tel: 407-423-8215, TELEX: 856443; Empl.: 85; *Sls. Mgr.:* Michael S. Shaw

GULTON GRAPHIC INSTRUMENTS DIV., A Mark IV Company, Gulton Ind'l. Pk., E. Greenwich, RI 02818, Tel: 401-884-6800, TWX: 710-387-1500; Empl.: 400

GULTON INDUSTRIES, INC., Servonic Div., 1644 Whittier Ave., Costa Mesa, CA 92627, Tel: 714-642-2400, 800-854-4066, TELEX: 183-532, TWX: 910-596-1352, FAX: 714-642-9490; FSC No.: 99564; Empl.: 320; *Sls. Mgr.:* Earl Pope

GUNTHER, W., GMBH, Vimsberger Strasse 51, D 8500 Nurnberg 82, West Germany, Tel: (0)911/65521 or 65520, TWX: 622351 Wigu d, FAX: (0)911/6552-239; Empl.: 340; *Sls. Mgr.:* Peter Busch

Refer to Spectron Inc., 595 Old Willets Path, P.O. Box 13368, Hauppauge, NY 11788 for reps. & distrs.Refer to Gordos Corporation, Bloomfield, New Jersey for Representatives and Authorized Distributor information.

GW INSTRUMENTS, INC., 35 Medford St., Somerville, MA 02143, Tel: 617-625-4096

G W THREE INCORPORATED, 7623 Fullerton Rd., 2nd Floor, Springfield, VA 22153, Tel: 703-451-2043

HACKER INSTRUMENTS, Box 657, Fairfield, NJ 07007, Tel: 201-226-8450, FAX: 201-808-8281; Empl.: 15

HADES MANUFACTURING CORP., 151 Verdi St., Farmingdale, NY 11735, Tel: 516-249-4244, FAX: 516-420-8135; FSC No.: 51578; Empl.: 18; *Sls. Mgr.:* K. Norris

HADLEY, ROBERT M. CO., INC., 750 West 51st St., Los Angeles, CA 90037, Tel: 213-234-9091, FAX: 213-234-2779; FSC No.: 72964; Empl.: 135; *Sls. Mgr.:* Charles A. Hadley

HADRON, INC., 9990 Lee Hwy., Fairfax, VA 22030, Tel: 703-359-6100, TELEX: 248454 TELCM UR; *Sls. Mgr.:* D. Laiti

HAEFELY TEST SYSTEMS, E. Haefely & Co. LTD., 2616 Morse Lane, Woodbridge, VA 22192, Tel: 703-494-1900, TELEX: WU 90 1097, FAX: 703-494-4597; Empl.: 800; *Sls. Mgr.:* George A. Przybys

HAFSTROM TECHNICAL PRODUCTS, INC., P.O. Box 9829, San Diego, CA 92109, Tel: 619-274-8822; Empl.: 10; *Sls. Mgr.:* J. R. Hafstrom

THE HALL COMPANY, 420 East Water St., Urbana, OH 43078, Tel: 513-652-1376, FAX: 513-653-7447; Empl.: 75

HALLMARK METALS INC., 610 W. Foothill Blvd., Glendora, CA 91740, Tel: 213-335-1263; Empl.: 20; *Sls. Mgr.:* Robert Schoenick

HALLMARK NAMEPLATE, INC., 1855 New Highway, Farmingdale, NY 11735, Tel: 800-645-9502, FAX: 516-454-6528; *Sls. Mgr.:* Dan Fortuna

HALMA ENTERPRISES, Tettex Instruments, 1055 W. Germantown Pike, Fairview Village, PA 19409-0281, Tel: 215-539-6050

HALMAR ELECTRONICS, INC., 900 N. Hague Ave., Columbus, OH 43204, Tel: 614-275-0530, TWX: 810-482-1654, FAX: 614-274-2559; Empl.: 130

HAMAMATSU CORPORATION, PO Box 6910, 360 Foothill Rd., Bridgewater, NJ 08807, Tel: 201-231-0960, TELEX: 833403, FAX: 201-231-1218; Empl.: 150; *Sls. Mgr.:* George Marshall; *Dist. Mgr.:* George Marshall

HAMAMATSU PHOTONICS K.K., 325-6 Sunayama-Cho, Hamamatsu City, Shizuoka Pref, Japan, Tel: 0534-52-2141, FAX: 0534-56-7889; Empl.: 1200; *Sls. Mgr.:* H. Hiruma

HAMEG, INC., 88-90 Harbor Rd., Port Washington, NY 11050, Tel: 516-883-3837, TELEX: 023-497-4606, FAX: 516-883-3894; *Sls. Mgr.:* Alex Orloff

Local Distributors

AL	Huntsville, B & C Instr.	205-883-6530
AZ	Phoenix, Jensen Tools Inc.	602-968-6241
CA	Anaheim, R & D Elctrns. Supp.	714-773-0240
CA	Canoga Park, Rag Elctrns., Inc.	818-998-6500
CA	El Segundo, Time Motion Tools	213-772-8170
CA	San Diego, Gateway Elctrns.	619-279-6802
CA	San Diego, Instr. Engrs.	619-268-8344
CA	Santa Ana, Action Elctrns.	714-547-5169
CA	Van Nuys, Testek	818-786-6890
CO	Denver, Gateway Elctrns.	303-458-5444
CT	Hamden, Kaufman Inst. Lab	203-776-7201
CT	Newtown, CT Calibration Lab	203-270-1263
FL	Hialeah, Kimball Elctrn. Lab Inc.	305-822-5792
FL	Miami, Walder Elctrn. Dist.	305-379-4794
FL	Tampa, Advanced Instrs.	813-876-4848
IL	Countryside, Pacific Indicator Co.	312-352-3500
IL	Joliet, Mainline Supp. Co. Inc.	815-436-3900
IL	Joliet, Primus Elctrns. Corp.	815-436-8945
MD	Hunt Valley, Tessco Inc.	301-785-5300
MD	Lanham, Sel-tronics Inc.	301-731-8080
MD	Silver Spring, Print	301-587-7824
MA	North Andover, Contact East	617-682-2000
MN	Minneapolis, Tonka Tech. Sls.	612-593-1770
MO	Kansas City, Indl. Svc. Labs	816-587-5400
MO	St. Louis, Gateway Elctrns.	314-427-6116
MO	St. Louis, Indl. Svc. Labs	314-423-3141
MO	St. Louis, Scherrer Instr. Inc.	314-644-5362
NJ	Clarksburg, Accutest Instr. Inc.	609-259-0460
NJ	Whippany, General Calibration	201-428-2880
NY	Bohemia, Exphil Calibration Labs	516-563-3520
NY	Great Neck, Instr. Mart	516-487-7430
OH	Moraine, MCM Elctrns.	513-434-0031
OR	Portland, Westeonn Elctrns.	503-283-0132
TX	Houston, Gateway Elctrns.	713-978-6575
UT	Salt Lake City, Intermountain Instr. Inc.	801-487-3151
WA	Seattle, Eicher-Richards	206-523-7888
WI	Madison, Schrenk Sls.	608-255-7400

HAMILTON METALCRAFT, 848 N. Fair Oaks Ave., Pasadena, CA 91103, Tel: 818-795-4811, FAX: 818-795-9705; *Sls. Mgr.:* Mel Stahler

HAMILTON STANDARD CONTROLS/STANCOR, See Stancor/Hamilton Standard Controls

HAMILTON STANDARD DIV., United Technologies Corp., One Hamilton Road, Windsor Locks, CT 06096-1010, Tel: 203-654-6000, TELEX: 99-4439, FAX: 203-654-2620; *Sls. Mgr.:* Andrew H. Voorhis, VP Mktg.

HAMLIN

FAX: 414-648-5244

HAMLIN, Lake & Grove Sts., Lake Mills, WI 53551, Tel: 414-648-2361, TWX: 910-260-3740; Empl.: 1000; *Sls. Mgr.:* Ken Deans ..... **B•1513, 1751, 1957**

Local Sales Offices & Reps

AZ	Phoenix, Westrep	602-997-8899
CA	Anaheim, Westrep	213-404-3881
CA	San Diego, Westrep	619-566-6580
CA	Santa Clara, Westrep	408-988-8833
CO	Boulder, R-G Entprs.	303-447-9211
CT	North Haven, Coakley, Boyd & Abbett, Inc.	800-225-8402
FL	Altamonte Springs, Semtronic Assocs.	305-831-8233
GA	Jonesboro, Wallace Elctrn. Sls.	404-471-6297
IL	Skokie, Indl. Rep.	312-967-8430
IN	Carmel, TMC	317-844-8462
IN	Fort Wayne, TMC	219-432-5553
IA	Cedar Rapids, Palatine Sls.	319-365-8071
KY	Louisville, TMC	502-499-7808
MD	Columbia, Delta III Assocs.	301-730-4700
MA	Needham Heights, Coakley, Boyd & Abbett, Inc.	617-444-5470
MI	Farmington Hills, J. L. Montgomery Assocs.	313-489-0099
MN	Minneapolis, R-J, Inc.	612-866-3661
MO	Blue Springs, Palatine Sls.	816-229-4007
MO	Hazelwood, Palatine Sls.	314-839-0800
NH	Plaistow, Coakley, Boyd & Abbett, Inc.	800-225-8402
NJ	Marlton, Naudain Assoc.	609-983-5300
NY	Great Neck, Tylinski Assocs.	516-466-9070
NY	Ithaca, Bob Dean, Inc.	607-257-1111
NC	Kernersville, Wallace Elctrn. Sls.	919-996-2742
OH	Dayton, Bear Mktg.	513-299-5877
OH	Richfield, Bear Mktg.	216-659-3131
TX	Austin, Allied Comps.	512-331-4494
TX	Dallas, Allied Comps.	214-238-0408
TX	Hurst, Allied Comps.	817-589-0456
WA	Bellevue, Testco, Inc.	206-454-7422
WI	Milwaukee, Indl. Rep.	414-259-0965
Can		416-475-8500
Can	Mississauga, Ont, Hi-Tech Sls.	416-672-0284

Local Distributors

AZ	Phoenix, Heilind Elctrns.	602-437-1060
AZ	Tempe, Circuit Specialties	602-966-0764
CA	Buena Park, Cypress/RPS Elctrns.	213-744-0255
CA	Fullerton, Pyramid Elctrns.	714-773-0781
CA	Hawthorne, Electrosonic Comps.	213-988-4455
CA	San Jose, Cypress Elctrns. Inc.	408-945-8400
CA	Santa Clara, Patane Avionics	408-496-6151
CA	Santa Clara, Pyramid Elctrns.	408-727-9810
CO	Englewood, Ind. Elctrns.	303-694-9444
CT	Bethel, Heilind Elctrns.	203-797-8600
CT	Hartford, Hatry Elctrns.	203-527-1881
CT	New Haven, Hatry Elctrns.	203-787-5921
CT	Stratford, Hatry Elctrns.	203-375-5866
CT	Wallingford, Sager Elect. Supp.	203-265-4600
CT	Waterbury, Hatry Elctrns.	203-755-1181
FL	Lakeland, AA Elec.	813-665-6941
FL	Longwood, Intertec Inc.	305-834-7777
FL	Miami, Elctrn. Equip. Co.	305-871-3500
FL	Orlando, Hammond Elctrn.	305-849-6060
FL	Tampa, Leader Elctrns.	813-870-3315
GA	Atlanta, Specialty Distrbg. Co.	404-873-2521
GA	Norcross, AA Elec.	404-449-8670
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Palatine, Ohm Elctrns.	312-359-5500
IN	Carmel, Altex Elctrns.	317-848-1323
IN	Ft. Wayne, Graham Elctrns.	219-424-3422
IN	Indianapolis, Graham Elctrns.	317-634-8202
IA	Cedar Rapids, Iowa Radio Supp. Co.	319-393-4510
MD	Gaithersburg, Pioneer/Wash.	301-921-0660
MA	Burlington, Heilind Elctrns.	617-272-5610
MA	Hingham, Sager Elec. Supp.	617-749-6700
MI	Grand Rapids, Calder Elctrns.	616-698-7400
MI	Oak Park, Newark Elctrns.	313-967-0600
MN	Fridley, Voyager Electronics	612-571-7766
MN	Minneapolis, Newark Elctrns.	612-331-6350
MO	St. Louis, Olive Indl. Elctrns.	314-426-4500
NH	Hudson, Heilind Elctrns.	603-883-9536
NJ	Berlin, General Comps., Inc.	609-768-6767
NJ	Oakland, Relay Spec.	201-337-1000
NJ	Pennsauken, Resco Elctrns.	609-662-4000
NM	Albuquerque, Bell Inds.	505-292-2700
NY	Buffalo, Summit Distr.	716-844-3540
NY	Lynbrook, Peerless Radio Corp.	516-593-2121
NY	Rochester, Masline Elctrns.	716-546-5373
NY	Rome, Rome Elctrns.	315-337-5400
NC	Winston-Salem, Kirkman Elctrns.	919-722-9131
OH	Cincinnati, Graham Elctrns.	513-772-1661
OH	Solon, Repco	216-248-8900
OK	Tulsa, Radio, Inc.	918-587-9123
OR	Portland, Radar Elec.	503-233-3691
PA	McKeesport, Barno Radio	412-751-5966
TX	Dallas, Harrison Equip. Co.	214-239-2750
TX	Farmers Branch, Heilind Elctrns.	214-351-2058
TX	Fort Worth, Allied Elctrns.	214-265-9341
TX	Houston, Harrison Equip.	713-879-2711
TX	Houston, Heilind Elctrns.	713-988-2711
WA	Kent, Interface Elctrns.	206-872-5800
WA	Seattle, Radar Elec. Co.	206-282-2511
WA	Spokane, Radar Elec. Co.	509-747-3053
WI	Cedarburg, AA Elec.	414-377-7500
WI	Mequon, Taylor Elec.	414-241-4321
Can	Burnaby, B. C., Rae Indl. Elctrns.	604-291-8866
Can	Burnaby, B. C., Semad Elctrns.	604-438-2515
Can	Dorval, Que., Semad Elctrns.	514-636-4614
Can	Downsview, Ont., Rae Indl. Elctrns.	416-736-1750
Can	Markham, Ont., Semad Elctrns.	416-475-3922
Can	Ottawa, Ont., Semad Elctrns.	613-729-6145
Can	Surrey, B. C., Memco Elctrn. Mkts.	604-590-1553

HAMLIN LCD, A Div. of Standish Inds., W7514 Hwy V, Lake Mills, WI 53551, Tel: 414-648-2315, FAX: 414-648-8696; Empl.: 250; *Sls. Mgr.:* Eastern:Brent Hering ..... **B•1081**

Local Sales Offices & Reps

AZ	Phoenix, Westrep	602-820-9932
CA	Anaheim, Westrep	213-404-3881
CA	San Diego, Westrep	619-566-6580
CA	Santa Clara, Westrep	408-988-8833
CO	Boulder, R-G Entprs.	303-447-9211
CT	North Haven, Coakley, Boyd & Abbett, Inc.	800-225-8402
FL	Altamonte Springs, Semtronic Assocs.	407-831-8233
GA	Jonesboro, Wallace Elctrn. Sls.	404-471-6297
IL	Skokie, Indl. Rep.	312-967-8430
IN	Carmel, TMC	317-844-8462
IN	Ft. Wayne, TMC	219-432-5553
IA	Cedar Rapids, Palatine Sls.	319-365-8071
KY	Louisville, TMC	502-893-1377
MD	Columbia, Delta III Assocs.	301-730-4700
MA	Needham Hgts., Coakley, Boyd & Abbett, Inc.	617-444-5470
MI	Farmington Hills, J.L. Montgomery Assocs.	313-489-0099
MN	Minneapolis, R-J, Inc.	612-866-3661
MO	Blue Springs, Palatine Sls.	816-229-4007
MO	Florissant, Palatine Sls.	314-839-0800
NH	Plaistow, Coakley, Boyd & Abbett, Inc.	800-225-8402
NJ	Marlton, Naudain Assoc.	609-983-5300
NY	Great Neck, Coakley, Boyd, Abbbett, Tylinski	516-466-9070
NY	Ithaca, Bob Dean, Inc.	607-257-1111
NC	Kernersville, Wallace Elctrn. Sls.	919-996-2742
OH	Centerville, Bear Mktg.	513-436-2061
OH	Richfield, Bear Mktg.	216-659-3131
TX	Austin, Allied Comps.	512-331-4494
TX	Dallas, Allied Comps.	214-238-0408
TX	Hurst, Allied Comps.	817-589-0456
WI	Milwaukee, Indl. Rep.	414-259-0965
Can	Mississauga, Ont., Hi-Tech Sls.	416-672-0284

Local Distributors

AZ	Phoenix, Force Elctrns.	602-437-1060
AZ	Tempe, Circuit Specialties	602-996-0764
CA	Buena Park, Cypress/RPS Elctrns.	213-744-0355
CA	Fullerton, Pyramid Elctrns.	714-773-0781
CA	Hawthorne, Electrosonic Comps.	213-970-0997
CA	San Diego, Cypress Elctrns.	619-535-0011
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CA	Santa Clara, Pyramid Elctrns.	408-727-9810
CO	Englewood, Ind. Elctrns.	303-694-9444
CT	Bethel, Heilind Elctrns.	203-797-8600
CT	Hartford, Hatry Elctrns.	203-527-1881
CT	New Haven, Hatry Elctrns.	203-787-5921
CT	Stratford, Hatry Elctrns.	203-375-5866
CT	Wallingford, Sager Elect. Supp.	203-265-4600
CT	Waterbury, Hatry Elctrns.	203-755-1181
FL	Ft. Lauderdale, Hammond Elctrns.	305-973-7103
FL	Lakeland, AA Elec.	813-665-6941
FL	Longwood, Intertec Inc.	305-834-7777
FL	Miami, Elctrn. Equip. Co.	305-871-3500
FL	Orlando, Hammond Elctrn.	305-849-6060
GA	Doraville, Specialty Distrbg.	404-458-6341
GA	Norcross, AA Elec.	404-449-8670
GA	Norcross, Emsco	404-925-8366
GA	Norcross, Specialty Distrbg.	404-448-4004
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Palatine, Ohm Elctrns.	312-359-5500
IN	Carmel, Altex Elctrns.	317-848-1323
IN	Ft. Wayne, Bell Inds.	219-423-3422
IN	Indianapolis, Bell Inds.	317-634-8202
IA	Cedar Rapids, Iowa Radio Supp. Co.	319-393-4510
MD	Gaithersburg, Pioneer/Wash.	301-921-0660
MA	Hingham, Sager Elec. Supp.	617-749-6700
MA	Wilmington, Heilind Elctrns.	617-657-4870
MI	Grand Rapids, Calder Elctrns.	616-698-7400
MI	Oak Park, Newark Elctrns.	313-967-0600
MN	Fridley, Voyager Elctrns.	612-571-7766
MN	Minneapolis, Newark Elctrns.	612-331-6350
MN	Thief River Falls, Digikey	218-681-6674
MO	Maryland Hgts., Chelsea Inds.	314-997-7709
NJ	Berlin, General Comps., Inc.	609-768-6767
NJ	Oakland, Relay Spec.	201-337-1000
NJ	Pennsauken, Resco Elctrns.	609-662-4000
NM	Albuquerque, Bell Inds.	505-292-2700

NY Buffalo, Summit Distr. 716-887-2810
NY Lynbrook, Peerless Radio Corp. 516-593-2121
NY Rochester, Masline Elctrns. 716-546-5373
NY Rome, Rome Elctrns. 315-337-5400
NC Winston-Salem, Kirkman Elctrns. 919-722-9131
OH Cincinnati, Graham Elctrns. 513-772-1661
OH Dayton, Bell Inds. 513-435-8660
OH Solon, Repco 216-248-8900
OH Twinsburg, Advacom 216-425-8477
OK Tulsa, Radio, Inc. 918-587-9123
OR Portland, Radar Elec. 503-233-3404
PA Export, Advacom 412-733-5400
PA McKean, Advacom 814-476-7774
PA McKeesport, Barno Radio 412-751-5966
PA Philadelphia, Resco Elctrns. 215-743-6702
SC Greenville, Emsco 803-233-4121
TX Dallas, Harrison Equip. Co. 214-239-2750
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Houston, Harrison Equip. 713-879-2711
TX Stafford, Southwest Elctrns. 713-240-4000
WA Kent, Interface Elctrns. 206-872-5800
WA Seattle, Radar Elec. Co. 206-282-2511
WA Spokane, Radar Elec. Co. 509-747-3053
WI Cedarburg, AA Elec. 414-377-7500
WI Mequon, Taylor Elec. 414-241-4321
Can Burnaby, B.C., Semad Elctrns. 604-438-2515
Can Calgary, Alberta, ITT Multicomponents 403-251-5888
Can Concord, Ont., ITT Multicomponents .. 414-736-1144
Can Downsview, Ont., Rae Indl. Elctrns. 416-736-1750
Can Edmonton, Alberta, ITT Multicomponents 403-451-4001
Can Halifax, Nova Scotia, ITT Multicomponents 902-465-2350
Can Markham, Ont., Semad Elctrns. 416-475-4158
Can Ottawa, Ont., Semad Elctrns. 613-727-9489
Can Point Clare, PQ, Semad 514-694-0860
Can Quebec, PQ, ITT Multicomponents 514-335-7697
Can Saskatoon, Saskatchewan, ITT Multicomponents 306-933-2888
Can Surrey, B.C., Memco Elctrn. Mkts. 604-590-1553
Can Toronto, Ont., ITT Multicomponents ... 416-736-1144
Can Vancouver, B.C., ITT MultiComponents 604-291-8866
Can Winnipeg, Manitoba, ITT MultiComponents 204-786-8401
WA Bellevue, Testco, Inc. 206-454-7422

HAMMOND MANUFACTURING CO., 1690 Walden Ave., Buffalo, NY 14225, Tel: 716-894-5710, FAX: 716-894-1156; Empl.: 1,450; *Sls. Mgr.:* Ray Shatzel ..... **C•1057; D•1791**

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CA San Carlos, Hickey Indl. Sls. 415-594-9978
CA Studio City, Bert Moore & Assocs. 213-877-5955
CO Northglenn, Challenge Sls. 303-450-2402
GA Atlanta, Millar Elctrns. 404-634-3350
IL Highland Park, Bransky Sls. 312-433-2375
IN Indianapolis, Wilson Tech. Sls. 317-872-2513
MD Woodbine, DJC Elctrn. Sls. 301-795-7020
MA N. Scituate, W. A. Hendrickson Co. 617-545-0652
MI Troy, Component Assocs. 313-643-8460
MN Golden Valley, Ambassador Inds. Mktg. 612-542-8437
MO St. Louis, Kathrinus, Kelly & Baumhauer 314-647-2400
NY Islip, ABS Technlgs., Inc. 516-277-7101
NY Victor, Net Sls. 716-924-1844
NC Raleigh, Millar Elctrns. 919-828-8840
OH Reynoldsburg, Benchmark Sls. & Mktg. 614-861-2070
PA Philadelphia, DJC Elctrn. Sls. 215-334-4533
TX Dallas, J. Y. Schoonmaker Co., Inc. 214-349-1650

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AZ Phoenix, Electronic Parts Co. 602-277-7281
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AR Ft. Smith, Carlton Bates 501-646-8201
AR Little Rock, Carlton Bates 501-562-9100
AR Texarkana, Lavender Dist. Corp. 501-773-4631
CA Chatsworth, Poco Sls. 818-700-8727
CA Manhattan Beach, Prime Electro 213-379-3642
CA Milpitas, Zack Elctrns. 408-942-5432
CA Redwood City, H.D.B. 415-368-1388
CA San Diego, Western Radio Elec. 619-268-4400
CA San Jose, Con. Parts, Inc. 408-435-1200
CA San Jose, Quement Elctrns. 408-998-5900
CA San Rafael, Elctrns. Plus 415-457-0466
CA Santa Ana, ITT Multicomponents 714-727-4001
CA Santa Clara, Pyramid Elctrns. 408-727-9810
CO Denver, Fistell Elctrns. 303-629-1312
CT Bridge Port, Park Distrbg. 203-366-7200
CT Danbury, Pilgrim Elec. 203-792-7274
CT Hartford, Hatry Elec. 203-527-1881
CT New London, Jan Elctrn. Supp. 203-442-4386
CT Norwalk, Cobra 203-847-6442
CT Stratford, Hatry Elec. 203-375-5866
CT Wallingford, Midstate Elec. 203-265-9900
DE Wilmington, Whisl. Elctrns. 302-652-3222
FL Orlando, EMSCO 407-849-6060
FL Tampa, EMSCO 813-253-2684
GA Atlanta, Ack, Inc. 404-351-6340
GA Norcross, Whitehead Elctrns. 404-923-6667
GA Norcross, Wholesale Inds. Elec. 404-447-8431
IL Chicago, Newark Elec. 312-784-5100
IL Joliet, Mainline Elec. 815-436-3900
IL Mt. Prospect, Magnuson Elctrns. 317-956-0700
IL Niles, Joseph Elec. 312-297-4200
IL Wheeling, Hawk Elec. 312-459-4030
IN Indianapolis, Advent Elec. 317-872-4910
IN Indianapolis, Mar Elec. 317-633-6699
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KY Louisville, Peerless Elctrns. 502-637-7674
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MA Lynn, Land Elec. Supp. 617-592-2220
MA Needham, Y.D.I. 617-449-1005
MA Wellesley Hills, Target Elctrns. Supp. .. 617-235-2545
MA Woburn, Abbott Elec. 617-935-2040
MI Farmington Hills, Advent Elctrns. 313-477-1650
MN Minneapolis, Bergquist 612-835-2322
MN Minneapolis, Tortec Corp. 612-866-3662
MO Kansas City, Electronic Supp. 816-931-0250
MO St. Louis, Van Sickle Radio 314-621-5000
NV Las Vegas, Kiesub Corp. 702-733-3888
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NJ Edison, Brownell Elctrns. 201-287-2037
NJ Oakland, Relay Specialties 201-337-1000
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NM Albuquerque, Beta Tron Elctrns. 505-821-1122
NY Buffalo, Genesee Ind. Elec. 716-873-9661
NY Buffalo, Summit Dist. 716-887-2800
NY Commack, Spartan Elctrns. 516-499-9500
NY Hempstead, Davis Elctrns. 516-483-9200
NY Poughkeepsie, Chief Elctrns. 914-471-1300
NY Rochester, Goldcrest Elec. 716-546-8464
NY Rochester, Masline Elec. 716-546-5373
NY Rome, Rome Elec. 315-337-5400
NY Syracuse, Salina Elec. 315-422-2336
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NC Greensboro, Hammond Elec. 919-275-6391
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OH Columbus, Thompson Elec. Supp. 614-228-6191
OH Dayton, Stotts Friedman 513-298-5555
OK Oklahoma City, Radio, Inc. 405-528-2391
OK Tulsa, Radio, Inc. 918-587-9123
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PA York, Rosen Elctrns. 717-843-3875
RI Pawtucket, Jabbour Elctrn. Supp. 401-728-4600
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SC Greenville, EMSCO 803-233-4121
TN Knoxville, Bondurant Bros. 615-573-9151
TX Austin, Galtronics 512-837-7470
TX Corpus Christi, Douglas Elec. 512-883-5103
TX Dallas, Off-the-Shelf Comps. 214-247-0052
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UT Salt Lake City, Standard Elec. Supp. .. 801-486-3371
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VA Norfolk, Norfolk Wire 804-499-1100
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WI Mequon, Taylor Elec. 414-241-4321
WI Oshkosh, Elctrn. Inds. 414-235-8930
WI Racine, Badger Elctrn. Supp. 414-637-1256

HANCOCK ELECTRONICS CORP., 75 Terry Drive, Hingham, MA 02043, Tel: 617-740-4190, FAX: 617-740-4192; FSC No.: 66851; Empl.: 8; *Sls. Mgr.:* Robert H.Sturdy

HAND HELD PRODUCTS, INC., 8008 Corporate Center Dr., Charlotte, NC 28226, Tel: 704-541-1380, TWX: 810-621-0380 PROTECH, FAX: 704-541-1333; *Sls. Mgr.:* Scott Cardais; *Dist. Mgr.:* Scott Cardais

H & L INSTRUMENTS, 1440 Rollins Road, Burlingame, CA 94010, Tel: 415-342-7850, FAX: 415-347-1065; Empl.: 3; *Sls. Mgr.:* Jenifer H. Landman

HANDY & HARMAN ELCTRN. MATLS. CORP., 72 Elm St., Box 1031, N. Attleboro, MA 02761-1031, Tel: 508-695-1401, FAX: 508-695-7565; Empl.: 300; *Sls. Mgr.:* T. Longo

HANKSCRAFT MOTORS, Div. of Gerber Prods. Co., P.O. Box 120, Reedsburg, WI 53959, Tel: 608-524-4341, FAX: 608-524-6779; Empl.: 550

HANOVIA, Canrad, 100 Chestnut St., Newark, NJ 07105, Tel: 201-589-4300, TELEX: 13-8531, FAX: 201-589-4430; Empl.: 250; *Sls. Mgr.:* Tom Tarantino; *Dist. Mgr.:* Tom Tarantino

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HARBISON INDUSTRIAL PRODUCTS, 7205 Hibbs La., Levittown, PA 19057, Tel: 215-943-9000, FAX: 215-949-1518; Empl.: 40

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HARDMAN INC., 600 Cortlandt St., Belleville, NJ 07109, Tel: 201-751-3000, TWX: 710-995-4940; Empl.: 105

HAROWE SERVO CONTROLS, INC.:A FASCO CO., 110 Westtown Rd. P.O. Box 547, West Chester, PA 19380, Tel: 215-692-2700, TELEX: 685-1176; FSC No.: 06989; Empl.: 300; *Sls. Mgr.:* Clayton A. Walters

HARREL, INC., 16 Fitch St., E. Norwalk, CT 06855, Tel: 203-866-2573; *Sls. Mgr.:* Richard Decew

HARRIS CORP., Computer Systems Div., 2101 W. Cypress Creek Rd., Ft. Lauderdale, FL 33309, Tel: 305-974-1700, TWX: 510-956-9473, FAX: 305-977-5580; FSC No.: 29436

HARRIS CORP., Dracon Div., 809 Calle Plano, Camarillo, CA 93010, Tel: 805-987-9511, TELEX: 182327; Empl.: 350; *Sls. Mgr.:* Tom Erdmann; *Dist. Mgr.:* Keith Boutillier

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HARRIS SEMICONDUCTOR, Box 883, Melbourne, FL 32902, Tel: 305-724-7400, TWX: 510-959-6259; FSC No.: 34371; Empl.: 2300; *Sls. Mgr.:* Dan McCranie; *Dist. Mgr.:* Charles H. Beaty

HARTLEY PRODUCTS, 1200 N. 23rd St., Ste. 105, Wilmington, NC 28405, Tel: 919-763-7422; *Sls. Mgr.:* R. Schmetterer

HARTMANN, 10097 Tyler Place, Ijamsville, MD 21754, Tel: 301-831-1055, FAX: 301-831-8072; Empl.: 2; *Sls. Mgr.:* Nancy Schwartz

HARTWELL CORP., 900 S. Richfield Rd., Placentia, CA 92670, Tel: 714-993-4200, TELEX: 683-485, TWX: 910-596-1294; FSC No.: 83014; Empl.: 425

HARWIL, 1548 17th St., Santa Monica, CA 90404, Tel: 213-829-2310, FAX: 213-829-2259; Empl.: 10

HASCO COMPONENTS, INC., 247-40 Jericho Tpke., Bellrose Village, NY 11001, Tel: 516-328-9292, TWX: 710-582-5750, FAX: 516-326-9125; Empl.: 30; *Sls. Mgr.:* Tab Hauser ..... **B•1514-1521, 1752**

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CA Irvine, Groh Assocs. 714-837-9871
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MI Brighton, AP Assocs. 313-229-6550
MN Minneapolis, Holmgren Assocs. 612-786-7641
NJ Parlin, JMR 201-254-8484
NY Long Island, Hasco Comps. 516-328-9292
WA Seattle, Jensen Assocs. 206-874-2772
Can Toronto, Ont., CEA Assocs. 416-231-9717

Hathaway

FAX: 918-438-7629

HATHAWAY CORPORATION: MOTION CONTROL DIV., 10837 E. Marshall, Tulsa, OK 74116, Tel: 918-438-7800; Empl.: 80; *Sls. Mgr.:* David Richards ..... **B•1253**

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AL Huntsville, DHR Mktg., Inc. 205-722-0440
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CA Santa Clara, Fahrner Miller Assoc., Inc. 408-727-9800
CO Englewood, Dynatech, Inc. 303-773-2830
CT Waterbury, Underwood Sls. Corp. 508-256-8191
FL Tampa, DHR Mktg., Inc. 407-740-7940
GA Duluth, DHR Mktg., Inc. 404-564-0529
IL Addison, Vikeland Sls., Inc. 312-832-8425
MA Lowell, Underwood Sls. Corp. 508-256-8191
MI Brighton, A.P. Assocs., Inc. 313-229-6550
MN St. Paul, Vikeland Sls., Inc. 612-645-4647
NY Sidney, Southern Tier Equip. 607-563-8978
NC Raleigh, DHR Mktg., Inc. 919-829-1970
OH Cincinnati, Stegman Blaine Mktg. 513-729-1969
OR Portland, General Elctrns. 503-297-8500
PA Philadelphia, Homersmith, Inc. 215-543-2434
SC Greenville, DHR Mktg., Inc. 803-235-3594
TN Nashville, DHR Mktg., Inc. 615-331-2745
TX Dallas, R.F. Kimball Co., Inc. 214-231-3447
VA Richmond, DHR Mktg., Inc. 304-359-8803
WI Waukesha, Vikeland Sls., Inc. 414-782-1133

HAUMAN, INC., 2031 Ringwood Avenue, San Jose, CA 95131, Tel: 408-434-0888, TELEX: 510-101-2820, TWX: 408-434-9832; *Sls. Mgr.:* Tom Trieu ..... **D•1792-1793**

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CA Laguna Hills, ISI Svcs. 714-582-9180
CA San Diego, Instr. Engrs. 619-268-8344
CO Broomfield, Instr. Repair Labs. 303-469-5375
CT Newtown, Connecticut Cal Labs 203-270-1263
FL Tampa, Tampa Instrmn. 813-623-3979
GA Norcross, Allied Elctrns. 404-377-3555
IL Elgin, Allied Elctrns. 312-697-8200
IN Indianapolis, Loren Green 317-293-9827
KS Lenexa, A-Tech 913-268-9644
MD Marlow Hgts., Allied Elctrns. 301-423-0161
MA N. Billerica, Electra Test 617-667-8541
MN Minneapolis, Tonka Tech. Labs. 612-593-1770
NJ Clarksburg, Accutest Instrs. 609-259-0460
NY Great Neck, Instr. Mart 516-487-7430
NY Mineola, Allied Elctrns. 516-248-2360
NC Raleigh, Allied Elctrns. 919-876-5845
OR Portland, Westcon Inc. 503-283-0132
PA New Hope, John Bell 215-862-3762
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Garland, Tucker Elctrns. 214-348-8800
WA Redmond, Vanguard Elctrns. 206-823-4111

HAVERLY SYSTEMS, INC., 78 Broadway, Box 919, Denville, NJ 07834, Tel: 201-627-1424, FAX: 201-625-2296; Empl.: 33; *Sls. Mgr.:* Ken Spencer

HAYDON SWITCH & INSTRUMENT, 1500 Meriden Rd., P.O. Box 3329, Waterbury, CT 06705, Tel: 203-756-7441, TELEX: 643852-HSIINTLWBY, FAX: 203-756-8724; FSC No.: 02005; Empl.: 350; *Sls. Mgr.:* Christopher Bertellotti

HAZELTINE CORP., Emerson Electric Co., Cuba Hill Rd., Greenlawn, NY 11740, Tel: 516-261-7000, TELEX: 96-7800, TWX: 510-226-0239; Empl.: 1950

HBM, INC., 19 Bartlett Street, Marlboro, MA 01752, Tel: 508-624-4500, FAX: 508-485-7480; Empl.: 200; *Sls. Mgr.:* Robert Gray ..... **B•1958-1959**

Local Sales Offices & Reps

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MI Livonia, HBM, Inc. 313-462-1630
MA Marlborough, HBM, Inc. 508-624-4500
PA West Chester, HBM, Inc. 215-363-8883
Can Mississauga, Summa Engrg. Ltd. 416-624-1293
Can Mississauga, Ont., Summa Engrg., Ltd. 416-624-3188

HBS EQUIPMENT CORPORATION, 3000 Supply Ave., Los Angeles, CA 90040, Tel: 213-726-3033, TWX: 910-580-3179, FAX: 213-888-9982; Empl.: 50; *Sls. Mgr.:* D. Daniel

HC Power

FAX: 714-261-6584

HC POWER INC., 17032 Armstrong Ave., Irvine, CA 92714-5716, Tel: 714-261-2114; FSC No.: 0D6P8; *Sls. Mgr.:* Jack Graham ..... **D•1795-1797**

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CA Los Alamitos, Power Specialists 213-594-9418
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PA Allentown, Patterson Elctrns. Grp. 215-398-9668
TX Dallas, Dynamark 214-437-3333
UT Ogden, Taylor Mktg. 801-546-9570
WA Edmunds, Power Sources Unltd. 206-743-6641

HDR POWER SYSTEMS, INC., 4242 Reynolds Dr., Hilliard, OH 43026, Tel: 614-771-5500, FAX: 614-771-7219; Empl.: 90; *Sls. Mgr.:* Harlan W. Bates

HDS INC., 12310 Pinecrest Rd., Reston, VA 22091, Tel: 703-620-6200, TELEX: 64585, FAX: 703-620-3169; Empl.: 120

HEADWAY RESEARCH, INC., 3713 Forest La., Garland, TX 75042, Tel: 214-272-5431, TELEX: 73-0257, FAX: 214-272-7817; Empl.: 45

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CA Anaheim, California Tech. Svcs. 714-632-1724
CA Santa Clara, California Tech. Serv. 408-432-0492
CT Trumbell, Submicron Technlg. 203-375-8285
PA Haverford, Blason Ent., Inc. 609-767-6733

HEATH CO., Hilltop Road, St. Joseph, MI 49085, Tel: 616-982-3200, TELEX: 72-9421; Empl.: 2000

HEAT SYSTEM, INC., 1938 New Hwy., Farmingdale, NY 11735, Tel: 516-694-9555, TELEX: 825-339; Empl.: 35; *Sls. Mgr.:* Irwin Leibson

HECON CORP., 31 Park Rd., Tinton Falls, NJ 07724, Tel: 201-542-9200, TELEX: 13-2457; Empl.: 200; *Sls. Mgr.:* P. Shine; *Dist. Mgr.:* R. Drum

HEEGER, INC., 2946 E. 11th St., Los Angeles, CA 90023, Tel: 213-261-0382, 213-261-0383, FAX: 213-261-2214; Empl.: 10; *Sls. Mgr.:* Robert A. Heeger

HEI CORPORATION, 350 E. Randy Road, Carol Stream, IL 60188, Tel: 312-665-5500, FAX: 312-665-5769; Empl.: 20

HEI, INC., Hybrid Electronics Div., 1495 Steiger Lake Ln., Victoria, MN 55386, Tel: 612-443-2500, ESYLNK: 62940281, FAX: 612-443-2668; Empl.: 200; *Sls. Mgr.:* Leonard Klun ..... **A•1742; B•1322-1323**

Local Sales Offices & Reps

IN Indianapolis, EMCI 317-921-3450
MA Boston, Vector Assocs. 617-271-0000
MN Victoria, HEI Inc. 612-443-2500

HEI inc.

FAX: 612-443-2668

HEI, INC., Optoelectronics Div., 1495 Steiger Lake La., P.O. Box 5000, Victoria, MN 55386, Tel: 612-443-2500, TWX: 510-601-7785, ESYLNK: 62940281; Empl.: 200; *Sls. Mgr.:* Dale Nordquist ..... **A•1743; B•1322-1323**

Local Sales Offices & Reps

AL Huntsville, REP, Inc. 205-881-9270
AZ Phoneix, Toward Engrg. 602-955-3193
CA Chatsworth, Porter Co. 818-700-7792
CA Mountain View, Leddy Assocs. 415-969-6313
FL Orlando, Werndli & Assocs. 305-851-1923
GA Tucker, REP, Inc. 404-938-4358
IL Chicago, Synmark Sls. 312-390-9696
NY Commack, RC Engrg. 516-543-3325
NC Raleigh, REP, Inc. 919-851-3007
WA Bellevue, Olson Tech. Sls. 205-883-7792

HEINEMANN ELECTRIC CO., Brunswick Pike, Alt. Rte. 61, P.O.Box 6800, Lawrenceville, NJ 08648-0800, Tel: 609-882-4800, TELEX: 843431; FSC No.: 74193; Empl.: 350; *Sls. Mgr.:* N. J. Alzamora ..... **B•1370-1373**

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CA San Jose, O'Donnell Assocs. No. 408-432-1940
CA Torrance, O'Donnell Assocs., Inc. 213-539-9664
CO Englewood, CompuTech Mktg. 303-773-3981
FL Oviedo, Conley & Assocs. 305-365-3283
GA Duluth, Dixie Mktg. 404-381-5592
IL Northbrook, D. Dolin Sls. 312-498-6770
IN Ft. Wayne, O.H. Bromberg & Assocs. .. 219-456-6010
IA Hiawatha, Ard Sls. Co. 319-393-6392
KY Louisville, O.H. Bromberg & Assocs. .. 502-456-1498
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MA Southboro, Sullivan Tech. Sls. 617-485-2215
MI Southfield, L. H. Dickelman Co. 313-353-8210
MN Minneapolis, Furber Sls. Co., Inc. 612-881-3620
MO Creve Coeur, Hill & Co. 314-432-1136
MO Kansas City, Hill & Co. 816-361-1669
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NM Albuquerque, O'Donnell Assocs. SW .. 505-889-4522
NY Farmington, Canavan-Scanlon 716-924-7450
NY Syracuse, Canavan-Scanlon 315-437-1271
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PA Allison Park, KW Electrn. Sls. 412-487-4300
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CA Inglewood, Newark Elctrns. 213-671-7066
CA Los Angeles, Master Distrs. 213-452-1229
CA San Carlos, Campbell & George 415-594-1994
CA San Jose, Cazco Sls. 408-432-1943
CO Aurora, Jet Elctrns. 303-364-1000
CO Denver, CSID Inc. 303-292-9594
CO Denver, Newark Elctrns. 303-757-3351
CT Hartford, L. E. Whelan Co. 203-728-5800
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FL Oviedo, Dixie Sls. 305-365-5211
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MD	Maryland Hgts., LComp, Inc.	314-291-6200
MA	Newton, Green Shaw Co.	617-969-8900
MA	Woburn, Apparatus Svc.	617-933-5999
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MI	Southfield, Michigan Lectrols Corp.	313-353-1350
MI	Troy, I/O Corp. of Detroit	313-583-9152
MN	Minneapolis, Newark Elctrns.	612-331-6350
NH	Hudson, C & H Elctrns.	603-882-1133
NJ	Lawrenceville, Riverside Comps. Supp.	609-896-1611
NY	Johnson City, Help Elctrns., Inc.	607-729-3528
NY	Melville, Arrow Elctrns.	516-694-6800
NY	Roslyn, I/O Corp. of NY	914-964-1940
NY	Whitestone, Power Electro Supp. Co.	212-767-1447
NC	Charlotte, Joyce Sls. Co.	704-377-1555
OH	Cleveland, I/O Corp. of NY	216-432-2664
OH	Dayton, Duellman Elec.	513-461-5010
OH	Dayton, Stotts Friedman Co.	513-298-5555
OH	Shandon, Cartessa Corp.	513-738-4477
OH	Solon, REH Electrns.	216-248-1636
OH	Valley View, Newark Elctrns.	216-447-8860
OR	Portland, Taylor Elec.	503-233-5321
PA	Conshohocken, I/O Corp. of America	215-825-4610
PA	Erie, REM Elctrns.	814-453-5626
PA	West Chester, West Chester Elec. & Electrn.	215-696-7500
TN	Hixson, Techni-Tronics, Inc.	615-842-0514
TX	Dallas, Geeco Sls. Co.	214-341-2626
TX	Garland, Newark Elctrns.	214-494-5911
TX	Houston, Newark Elctrns.	713-782-4800
VA	Ashland, Hanover Controls & Supp. Corp.	804-798-2007
VA	Charlottesville, Va. Radio Supp. Co. Inc.	804-296-4184
WA	Seattle, H. C. Campbell Co.	206-433-1900
WI	Milwaukee, Hunt Co.	414-383-1781

HEITZ, KARL, INC., P.O. Box 427, Woodside, NY 11377, Tel: 718-565-0004; Empl.: 15

HELICAL PRODS. CO., INC., Box 1069, Santa Maria, CA 93456-1069, Tel: 805-928-3851, TWX: 910-351-5856, FAX: 805/928-2369; FSC No.: 13201; Empl.: 55; *Dist. Mgr.:* John Ricker

HELIONETICS, INC., DECC Div., 17312 Eastman St., Irvine, CA 92714, Tel: 714-261-8313, FAX: 714-261-0413; *Sls. Mgr.:* Charles Carter

HELM INSTRUMENT CO., INC., 1387 Dussel Drive, Maumee, OH 43537, Tel: 419-893-4356, TELEX: 28-6078, FAX: 419-893-1371; Empl.: 55

HENES PRODUCTS, 4225 E. Madison St., Phoenix, AZ 85034, Tel: 602-275-4126, TELEX: 530101; Empl.: 25

HERAEUS INC., Temp. Measurement Group, 111A Corporate Blvd., S. Plainfield, NJ 07080, Tel: 201-755-4800, FAX: 201-754-9494; Empl.: 250

HERBERT PRODS. INC., 180 Linden Ave., Westbury, NY 11590-0384, Tel: 516-334-6500, TWX: 510-222-5963, FAX: 516-334-6538; Empl.: 98; *Sls. Mgr.:* B. J. Simmons

HERMETIC SEAL CORP., 4232 Temple City Blvd., Rosemead, CA 91770, Tel: 213-283-0411, TWX: 910-587-3352, FAX: 818-443-6610; FSC No.: 04820; Empl.: 200

HERMETIC SWITCH, Box 1325, Hwy. 92, Chickasha, OK 73018, Tel: 405-224-4046, TELEX: 796125 Hermetic CKSA, FAX: 405-224-9423; FSC No.: 65623; Empl.: 150; *Sls. Mgr.:* R. Helms/Darla Ballard ..... **B•1753**

Local Sales Offices & Reps

CA	Arcadia, V. Gott & Assocs.	818-445-9728
CA	San Diego, V. Gott & Assocs.	619-566-5320
GA	Atlanta, Electro Technlg. Prods.	404-262-1522
IL	Woodridge, Trend-Tronics, Inc.	312-985-0626
KS	Lenexa, Midtec Assocs.	913-541-0505
MD	Timonium, Heller Sls.	301-252-4780
MA	Canton, New England Elctrn. Sls.	617-828-4835
MN	Minneapolis, Peterson Sls. & Assocs.	612-835-5281
MO	St. Louis, Midtec Assocs.	314-275-8666
NY	Oceanside, Current Inds.	516-678-3895
OR	Beaverton, LD Elctrns.	503-684-8221
PA	Furlong, Avenir	215-348-8290
TX	Austin, R. F. Kimball Co.	800-442-4506
TX	Houston, R. F. Kimball Co.	713-890-8810
TX	Richardson, R. F. Kimball Co.	214-231-3447
WA	Snohomish, LD Elctrns.	206-568-0511
WA	Spokane, LD Elctrns.	509-922-4883

HERTNER DIV.:EXIDE CORP., 12690 Elmwood Ave., Cleveland, OH 44111, Tel: 216-252-4242, FAX: 216-941-4330; FSC No.: 28398; Empl.: 100; *Sls. Mgr.:* R.C. Wright

HERTZ FILTER, 3 Aerial Way, Syosset, NY 11791, Tel: 516-822-4770; Empl.: 22

HEURISTICS INCORPORATED, 9845 Horn Rd., Ste. 170, Sacramento, CA 95827, Tel: 916-369-6606, TELEX: 4940010, FAX: 916-369-6175; Empl.: 37; *Sls. Mgr.:* Michael McMann

HEWLETT-PACKARD CO., 19310 Pruneridge Ave. CIC, IFD, Cupertino, CA 95014, Tel: 800-752-0900; Empl.: 87,000; *Sls. Mgr.:* Richard Alberding, VP Mktg. ..... **D•1278-1279, 1798-1801**

Local Sales Offices & Reps

AL	Birmingham	205-988-0547
AL	Huntsville	205-830-2000
AK	Anchorage	907-563-8855
AZ	Phoenix	602-273-8000
AZ	Tucson	602-573-7400
AR	Little Rock, Hewlett-Packard Co.	501-376-1844
CA	Calabasas	818-880-3400
CA	Foster City	415-378-8400
CA	Fresno	209-252-9652
CA	Fullerton	714-999-6700
CA	Goleta	805-685-6100
CA	Irvine	714-472-3000
CA	Long Beach	213-498-1111
CA	Los Angeles	213-337-8000
CA	Mountain View	415-694-2000
CA	N. Hollywood	818-505-5600
CA	Pleasanton	415-460-0282
CA	Sacramento	916-929-7222
CA	San Diego	619-279-3200
CA	San Francisco	415-882-6800
CA	Santa Clara	408-988-7000
CA	Ventura	805-658-6898
CO	Boulder	303-499-6655
CO	Englewood	303-649-5000
CT	Darien	203-656-0040
CT	Glastonbury	203-633-8100
FL	Ft. Lauderdale	305-973-2600
FL	Jacksonville	904-636-9955
FL	Melbourne	305-729-0704
FL	Orlando	305-859-2900
FL	Pensacola	904-476-8422
FL	Tampa	813-884-3282
GA	Atlanta	404-955-1500
GA	Norcross	404-448-1894
HI	Honolulu	808-526-1555
ID	Boise	208-323-2700
IL	Bloomington	309-662-9411
IL	Chicago	312-930-0010
IL	Naperville	312-357-8800
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KS	Wichita	316-684-8491
KY	Louisville	502-426-0100
LA	St. Rose	504-467-4100
MD	Baltimore	301-644-5800
MD	Rockville	301-948-6370
MA	Andover	617-682-1500
MA	Burlington	617-270-7000
MI	Grand Rapids	616-957-1970
MI	Novi	313-349-9200
MI	Troy	313-362-5180
MN	St. Paul	612-644-1100
MS	Jackson	801-982-9365
MO	Bridgeton	314-344-5100
MO	Kansas City	816-941-0411
NE	Omaha	402-493-0300
NJ	Paramus	201-265-5000
NJ	Parsippany	401-682-4000
NJ	Piscataway	201-562-6100
NM	Albuquerque	505-823-6100
NM	Los Alamos	505-662-6700
NY	Albany	518-458-1550
NY	Amhurst	716-689-3003
NY	Fairport	716-223-9950
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OR	Wilsonville	503-682-8000
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TX	San Antonio	512-494-9336
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Can	Edmonton, Alberta	403-486-6666
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Can	London, Ont.	519-686-9181
Can	Mississauga, Ont.	416-678-9430
Can	Moncton, New Brunswick	506-855-2841
Can	Ottawa, Ont.	613-820-6483
Can	Quebec City, Que.	418-648-0726
Can	Richmond, B.C.	604-270-2277
Can	Saskatoon, Saskatchewan	306-242-3702
Can	Victoria, B.C.	604-381-6616
Can	Willowdale, Ont.	416-499-2550
Can	Winnipeg, Manitoba	204-694-2777

HEXACON ELECTRIC CO., 161 W. Clay Ave., Roselle Park, NJ 07204, Tel: 201-245-6200, TELEX: 13-8812, FAX: 201-245-6176; Empl.: 150; *Sls. Mgr.:* Robert L. Miller

FAX: 201-245-3238

HEYCO MOLDED PRODUCTS, INC., Box 160, Kenilworth, NJ 07033, Tel: 201-245-0033, 800-526-4182; FSC No.: 28520; Empl.: 135 ..... **C•1863**

Local Distributors

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CA	Hayward, Arow Fasteners	800-227-2901
CA	Riverside, Elctms. Supp.	714-787-9220
CA	San Jose, Pro Fasteners	408-943-9177
IL	Shaumberg, Engrd. Fasteners	312-980-4082
IN	Elkhart, La Vanture Prods. Co.	219-264-0658
MD	Baltimore, Jandorf Elec. & Mfg.	301-358-5550
MA	Newton, In-Stock Prods.	617-964-6200
MN	St. Paul, Arden Fasteners	612-483-6681
MO	St. Louis, Engrd. Fastener Co.	314-434-2888
NY	Amityville, Yorkville Inds. Inc.	516-225-2100
OK	Oklahoma City, Wesco	405-232-5521
TN	Nashville, Arden Fasteners	615-889-7043
TX	Houston, Rainbow	713-957-0500
WI	Waukesha, Cable Comps.	800-558-4388

HH CONTROLS CO., INC., 16 Frost St, Arlington, MA 02174, Tel: 617-646-2626; Empl.: 13

HIBBING ELECTRONICS CORP., 3125 E 14th St, Hibbing, MN 55746, Tel: 218-263-8971, FAX: 218-263-8970; Empl.: 440; *Sls. Mgr.:* Michael Walsh

HICKOK ELECTRIC INSTRUMENT, 10514 DuPont Ave., Cleveland, OH 44108, Tel: 216-541-8060; Empl.: 450; *Sls. Mgr.:* Norm Holliday; *Dist. Mgr.:* Jeff Snider

HICO HORIZONS INTL. CO., See Maxon Precision Motors

HI-G COMPANY, A Subsidiary of Nytronics Inc., 101 Locust St., Hartford, CT 06114, Tel: 203-522-8600, TELEX: 643394, TWX: 710-425-1379, FAX: 203-524-8540; FSC No.: 02289; Empl.: 550; *Sls. Mgr.:* J. Parsons ..... **B•1522-1538**

Local Sales Offices & Reps

AL	Huntsville, 20th Century Mktg.	205-533-9281
AZ	Phoenix, Westrep	602-997-8899
CA	Anaheim, Westrep	213-404-3881
CA	San Diego, Westrep	619-566-6580
CA	Santa Clara, Westrep	408-988-8833
CO	Englewood, Omega	303-762-1921
CT	Bloomfield, Friedman Sls.	203-243-3122
FL	Orlando, Comp. Des. Mkt.	407-352-5480
GA	Norcross, 20th Century Mkt.	404-446-1999
IL	Highland Park, Bransky Sls.	312-433-2375
IN	Fort Wayne, TX Sls.	219-489-4447
IA	Cedar Rapids, Pattison Sls.	319-395-9866
KS	Olathe, Advanced Tech. Sls.	913-782-8702
MD	Monkton, Imagitron Sls. Co.	301-374-5600
MA	Needham, Friedman Sls.	617-459-7399
MI	Ft. Wayne, TX Sls.	219-489-4447
MN	St. Paul, Repco	612-642-2828
MO	St. Louis, Advanced Tech. Sls.	314-878-2921
NJ	West Caldwell, Grimm-Siegel Assoc.	201-575-9300
NY	E. Rochester, Tri-Tech Elctms.	716-385-6500
NC	Gary, 20th Century Mkt.	919-481-3370
OH	Miamisburg, Elctms. Comps., Inc.	513-866-3340
OR	Lake Oswego, RTS	503-244-4123
TN	Knoxville, 20th Century Mkt.	615-966-2099
TX	Euless, Fralia Co.	817-354-1144
WA	Vashon, RTS	206-285-1363
WI	Cedarburg, Bransky Sls.	414-377-6837
Can	Downsview, Ont., Designtronics	416-747-1171

Local Distributors

AL	Huntsville, Hallmark Elctms.	205-837-8700
AZ	Phoenix, Hallmark Elctms.	602-437-1200
AR	Little Rock, Electro Entprs.	501-562-6936
CA	Buena Pk., Cypress Elctms.	213-744-0355
CA	Canoga Park, Hall-Mark Elctms.	818-716-7300
CA	Citrus Hgts., Hall-Mark Elctms.	916-722-8600
CA	Irvine, Integrated Elctms.	714-660-1055
CA	San Diego, Hallmark Elctms.	714-268-1201
CA	San Jose, Cypress Elctms.	408-945-8400
CA	San Jose, Hall-Mark Elctms.	408-946-0900
CA	Santa Ana, Norstan Elctms.	714-250-4903
CA	Torrance, Hall-Mark Elctms.	213-217-8400
CA	Tustin, Hallmark Elctms.	714-359-0330
CO	Denver, Integrated Elctms.	303-292-6121
CO	Englewood, Hallmark Elctms.	303-790-1662
CT	Wallingford, Hallmark Elctms.	203-269-0100
FL	Clearwater, Hallmark Elctms.	305-530-4543
FL	Orlando, Hallmark Elctms.	305-855-4020
FL	Ovideo, Aztech	407-365-2241
FL	Pompano, Hallmark Elctms.	305-971-9280
GA	Norcross, Hallmark Elctms.	404-447-8000
IL	Wood Dale, Hallmark Elctms.	312-860-3800
IN	Indianapolis, Hallmark Elctms.	317-876-7165
KS	Lenexa, Hallmark Elctms.	913-888-4747
KS	Wichita, Lee Prods.	316-264-2172
MD	Columbia, Aztech	301-995-6859
MD	Columbia, Hallmark Elctms.	301-988-9800
MD	Columbia, Vantage Comps.	301-720-5100
MA	Billerica, Hallmark Elctms.	617-667-4129
MA	Woburn, A.C.I. Elctms.	617-935-7230
MN	Eden Prairie, Hallmark Elctms.	612-941-2600
MO	Maryland Heights, Hallmark Elctms.	314-291-5350
NJ	Clifton, Vantage Comps.	201-777-4100
NJ	Fairfield, Hallmark Elctms.	201-575-4415
NJ	Mt. Laurel, Hallmark Elctms.	609-235-1900
NJ	Oakland, Relay Specialties	201-337-1000
NY	Commack, Vantage Comps.	516-543-2000
NY	Hauppauge, Jaco Elctms.	516-273-5500
NY	Hauppauge, Sherburn Elctms.	516-231-4300
NY	Ron Kon Koma, Hallmark Elctms.	516-737-0600
NC	Raleigh, Hallmark Elctms.	919-872-0902
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OK	Oklahoma City, Electro Entprs.	405-427-6591
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TX	Houston, Hallmark Elctms.	713-781-6100
TX	Irving, Aztech	214-401-4118
UT	West Valley City, Hall-Mark Elctms.	801-972-1008
WA	Bellevue, Integrated Elctms.	206-455-2727
Can	Pointe Claire, Future	514-694-7710

HIGH ENERGY, Inductotherm Industries, Lower Valley Rd., Parkesburg, PA 19365, Tel: 215-593-2800, TELEX: 759888, FAX: 215-593-2985; Empl.: 65

HIGHLAND TECHNOLOGY, INC., 320 Judah Street, San Francisco, CA 94122, Tel: 415-753-5814; Empl.: 8; *Sls. Mgr.:* Hugh Callahan

HIGH REL BURN-IN, Riverside Assoc. Inc., 1710 Ringwood Ave., San Jose, CA 95131, Tel: 408-437-0300, FAX: 408-437-1418; FSC No.: 4Y548; Empl.: 30; *Sls. Mgr.:* Beth Pagano

HIGH TECHNOLOGY SENSORS, INC., 262 E. Hornbeam Dr., Longwood, FL 32779, Tel: 407-423-1755; Empl.: 7; *Sls. Mgr.:* R. M. Mindock

FAX: 914-968-0347

HIGH VOLTAGE TECHNOLOGY INC., 71 Alexander St., Yonkers, NY 10701, Tel: 914-423-6636; Empl.: 7; *Sls. Mgr.:* Pete Gonzalez ..... **D•1802-1804**

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EXP	Tokyo, Japan, EWIG Engrg.	03-464-1978

HILEVEL TECHNOLOGY, 31 Technology Drive, Irvine, CA 92718, Tel: 714-727-2100, TELEX: 655316, FAX: 714-727-2101; Empl.: 82; *Sls. Mgr.:* Dan Riordan

HILTON INDUSTRIES, INC., Subsidiary of Core Industries, 1177 Cattlemen Road, Sarasota, FL 34232, Tel: 813-371-2600, TWX: 810-864-4363, FAX: 813-371-7750; Empl.: 137; *Sls. Mgr.:* F. Moloney; *Dist. Mgr.:* F. Moloney

FAX: 914-279-2467

HIPOTRONICS INC., P.O. Drawer A, Brewster, NY 10509, Tel: 914-279-8091; FSC No.: 25284; Empl.: 200; *Sls. Mgr.:* Robert Schlesinger ..... **A•2304-2306; D•1280-1283, 1806-1807, 2203-2205**

Local Sales Offices & Reps

AL	Birmingham, Spader & Assocs.	205-979-5551
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CA	San Diego, RDX Corp.	619-581-0077
CA	San Dimas, RDX Corp.	714-599-0985
CA	Sunnyvale, RDX Corp.	408-734-4500
CO	Parker, Equal Elec. Inc.	303-841-8982
CT	Branford, Abbott Allison Co.	203-481-0405
FL	Daytona Bch. Shores, W. Rihm Assocs.	904-761-7130
GA	Decatur, Spader & Assocs.	404-296-3041
HI	Honolulu, B. F. Wittenberg	808-696-5538
IL	Hawthorne Woods, Ryan & Assocs.	312-438-2905
MO	St. Louis, Fitzgerald Sls. Co.	314-862-1660
MN	Edina, Ainslie Co.	612-920-2996
NJ	Union, Friedman Assocs., Inc.	201-964-6200
NM	Albuquerque, Brytec Sls. Inc.	505-884-1123
NY	Le Roy, Hasgo Power Equip.	716-768-8500
OH	Vermilion, Robert S. Howley	216-967-8787
PA	Downingtown, Kenn Ebert-Hipotronics	215-269-5898
UT	Salt Lake City, Riter Engrg. Co.	801-973-9063
WA	Redmond, Gore Elec. Co.	206-883-4505
PR	Santurce, Mario R. Franceschini Inc.	809-725-7080
Can	Burnaby, B.C., C. D. Nova	604-430-5612
Can	Halifax, B.C., D. C. Keddy Ltd.	902-453-1711
Can	Quebec, J46 1L9, Tremcour Elctrn.,Inc.	514-522-7757
Can	Weston, Ont., U-Tek Svcs. & Supp.	416-747-1879

HI-Q CRYSTALS, Hybrids International Ltd., 311 N. Lindenwood Dr., Olathe, KS 66062, Tel: 913-764-4544, TWX: 910-743-0029, FAX: 913-764-6400; Empl.: 20; *Sls. Mgr.:* Abdul Ghafoor ..... **A•1411**

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AZ Scottsdale, Arcom Sls., Inc. 602-947-5745
FL Ft. Lauderdale, MacKay, Smith & Assocs. 305-467-3888
FL Orlando, MacKay, Smith & Assocs. ... 407-277-1513
FL St. Petersburg, MacKay, Smith & Assocs. 813-530-1873
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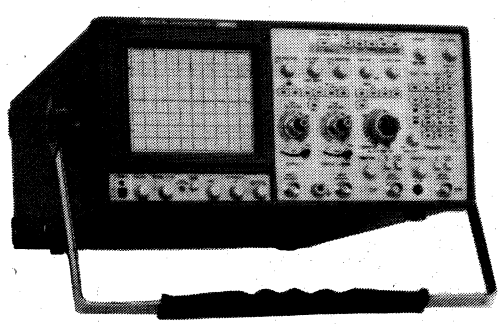

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NJ	Sussex, Carbone Assocs.	201-875-1882
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FL	Orlando, South Atlantic Comp. Sls.	407-857-3650
GA	Norcross, South Atlantic Comp. Sls.	404-447-6154
IL	Glenview, Crimson Engrg. Sls., Inc.	312-470-0024
IN	South Bend, Steddick and Assocs., Inc.	219-282-1629
MA	Holden, Vanguard Elctrns.	508-829-9081
NJ	Cherry Hill, Metz-Benham-Assocs., Inc.	603-424-0404
NY	Staten Island, Ken Huth Sls. Co., Inc.	718-984-1765
NC	Raleigh, South Atlantic Comp. Sls.	919-859-9970
PA	Wynnewood, Metz-Benham-Assocs., Inc.	215-896-7300
TX	Dallas, Passive Comps. Assocs.	214-824-6162
Can	Nepean, Ont., Ellam and Assocs. Ltd.	613-727-3892

HY-CAL ENGINEERING, 9650 Telstar Ave., El Monte, CA 91731, Tel: 818-444-4000, TELEX: 67-5548; FSC No.: 12199; Empl.: 125; *Sls. Mgr.:* D. Z. Chapman

HYCOMP, INC., 165 Cedar Hill St., Marlborough, MA 01752, Tel: 508-485-6300, TWX: 710-347-0385, FAX: 508-481-1547; FSC No.: 34707; Empl.: 65; *Sls. Mgr.:* V.P. Pai

HYLETRONICS:LITTON INDUSTRIES, Newtown Rd., Littleton, MA 01460, Tel: 617-486-8911, TWX: 710-347-0656; FSC No.: 22534; Empl.: 82; *Sls. Mgr.:* John W. Perkins

HYPERTRONICS CORP., 16 Brent Dr., Hudson, MA 01749, Tel: 508-568-0451, 800-225-9228, TELEX: 95-1152; FSC No.: 50541; Empl.: 145; *Sls. Mgr.:* E. Dalrymple ..... **C•1382-1385**

Local Sales Offices & Reps

AL	Huntsville, Elec. Mktg. Assoc.	205-880-8050
AZ	Scottsdale, TC Elctrns. Sls., Inc.	602-994-5153
CA	Mountain View, Leddy Assocs.	415-969-6313
CA	N. Hollywood, Jewett Co.	818-789-8103
CO	Commerce City, Williams Assocs.	303-289-5647
CT	Bethany, Reps. Corp.	203-393-0024
DC	Washington, Tyler Griffin Co.	EN1-4821
FL	Casselberry, Southern Elctrns. Sls.	305-332-4718
FL	Melbourne, Southern Elec. Sls.	407-242-9661
GA	Atlanta, Elec. Mktg. Assoc.	404-448-1215
IL	Downers Grove, Momak Sls.	312-936-6400
IL	Lisle, W.G. Controls	312-963-5954
IN	Indianapolis, CC Elctrns.	317-255-1508
IA	Cedar Rapids, Midwest Tech. Sls.	319-393-5115
KS	Lenexa, Midwest Tech. Sls.	913-888-1500
MD	Baltimore, Tyler Griffin Co.	EN9-4821
MD	Columbia, Tyler Griffin Co.	301-995-1215
MA	Wellesley, Reps. Corp.	617-237-6476
MA	Wellesley, The Reps	617-237-6476
MN	Bloomington, Mumco, Inc.	612-854-4161
NJ	Wayne, G.T. Assocs.	201-694-6040
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	E. Syracuse, R. D. Sherman	315-433-1165
NC	Raleigh, Elec. Mktg. Assoc.	919-847-8800
PA	Greensburg, Pro-Mark	412-832-3800
PA	Youngwood, Pro-Mark	412-925-1905
SC	Greenville, Elec. Mktg. Assoc.	803-233-4637
TX	Richardson, Milco Mktg.	214-783-2716
UT	Salt Lake City, Williams Assocs.	801-485-6511
WA	Bellevue, A.I.E. Inc.	206-455-4697

HY-TEC INDUSTRIES, Div. of Topo Industries, Inc., P.O. Box 91, Shoreham, NY 11786, Tel: 516-924-8686; *Sls. Mgr.:* Tom Poole

ICC, INC., 1144 W. Grove Ave., Orange, CA 92665, Tel: 714-998-8310, TELEX: 4992245ICCUSA, FAX: 714-998-5910; Empl.: 25

ICI INC., 1901 Petra La., Placentia, CA 92670, Tel: 714-579-7575, FAX: 714-579-3127; Empl.: 8

ICO-RALLY CORPORATION, 2575 E. Bayshore Rd., Palo Alto, CA 94303, Tel: 415-856-9900, FAX: 415-856-8378; FSC No.: 51705; Empl.: 45; *Dist. Mgr.:* Barbara Enad/Doug Frait

ICS ELECTRONICS CORP., 2185 Old Oakland Rd., San Jose, CA 95131, Tel: 408-432-9009, FAX: 408-943-1745; Empl.: 28; *Sls. Mgr.:* Thomas D. Curfman; *Dist. Mgr.:* Thomas D. Curfman

Local Sales Offices & Reps

AL	Huntsville, Saber Assocs.	800-327-0853
AZ	Phoenix, Scientific Dvcs.-West	602-730-9774
CA	Huntington Bch., Scientific Dvcs.-West	714-840-3501
CA	San Diego, Scientific Dvcs.	619-268-9635
CA	San Jose, Scientific Dvcs.-West	408-554-0455
CO	Denver, Scientific Dvcs.-West	303-469-5145
CT	Mt. Carmel, Scientific Dvcs.-New Eng.	203-248-9361
FL	Apopka, Saber Assocs.	407-724-0920
FL	Bradenton, Saber Assocs.	407-724-0920
FL	Melbourne, Saber Assocs.	407-724-0920
FL	N. Palm Bch., Saber Assocs.	407-724-0920
GA	Norcross, Saber Assocs.	800-327-0853
IL	Chicago, Berndt Assocs.	312-632-0900

IN Carmel, Berndt Assocs. 317-844-0114
LA New Orleans, Data Mktg. Assocs. 504-833-3655
MD Burtonsville, Eastern Instrmn. Corp. ... 301-384-8500
MA Waltham, Scientific Dvcs.-New Eng. ... 617-890-2252
MN Minneapolis, Berndt Assocs. 612-546-2021
MO Kansas City, EIR Co. 816-452-7030
NJ Teaneck, Scientific Dvcs.-East 201-837-1004
NM Albuquerque, Scientific Dvcs.-West ... 505-293-3494
NY Liverpool, Northern Tech. Sls. 315-451-1091
NC Clayton, Saber Assocs. 800-327-0853
OK Tulsa, Data Mktg. Assocs. 918-494-2711
PA Horsham, Scientific Dvcs.-East 215-956-0700
TX Austin, Data Mktg. Assocs. 512-338-4701
TX Dallas, Data Mktg. Assocs. 214-661-0300
TX Houston, Data Mktg. Assocs. 713-954-5020
TX San Antonio, Data Mktg. Assocs. 512-342-3031
UT Salt Lake City, Sci. Dvcs. 801-973-9411
WA Bellevue, The Western Rep 206-885-0004
WI Milwaukee, Berndt Assocs. 414-545-8400
Can Montreal, Interfax Sys. 514-336-0392
Can Ottowa, Ont., Interfax Sys. 613-726-8888
Can Toronto, Interfax Sys. 416-674-8970
Can Vancouver, B.C., Interfax Sys. 604-430-1410

Local Distributors

Can Montreal, Interfax 514-336-0392

IC SENSORS, INC., 1701 McCarthy Blvd., Milpitas, CA 95035, Tel: 408-432-1800, TELEX: 350066, FAX: 408-434-6687; Empl.: 150; *Sls. Mgr.:* Harold Joseph; *Dist. Mgr.:* Harold Joseph

idea

FAX: 213-690-1352

IDEA, INC., 1300 Pioneer St., Ste. B, Brea, CA 92621, Tel: 213-697-4332; *Sls. Mgr.:* Deborah K. Blackstone ..... **B•1086, 1166**

Local Sales Offices & Reps

AZ Fountain Hills, Westech Engrg. Sls. ... 602-837-3137
CA San Diego, Rad Tech Sys. 619-673-9203
FL Miami, Dan-Tech Sls., Inc. 305-963-6142
IL Lisle, Basic Mktg., Inc. 312-963-7086
IN Indianapolis, Mohrfield Mktg. 317-546-6969
IA Cedar Rapids, Tech. Elctrns., Inc. 319-366-5443
MD Randallstown, Chesapeake Indl. Mktg. 301-653-0476
MA Milford, Bennetron 617-478-4873
MN Golden Valley, Highland Elctrn. Sls. Co. 612-546-2123
MO Florissant, Deltron Co., Inc. 314-839-0033
NH Londonderry, Bennetron 603-432-9092
NY Bohemia, Aurora Mktg., Inc. 516-563-3131
OH Cleveland, KT/Depco 216-442-6200
OR Portland, General Elctrns., Inc. 503-297-8500
PA Pittsburg, KT/Depco 412-367-1011
TX Dallas, Tycom Sls. Co. 214-960-7368
VA Midlothian, Pacesetter Comp. Sls. 804-744-1337
WA Redmond, General Elctrns., Inc. 206-867-0969
Can Rexdale, Ont., True North Technig. Ltd. 416-744-2233

Local Distributors

CA Buena Park, Ford Elctrns., Inc. 714-521-8080
CA Mission Viejo, Opto Plus ò 714-380-8654
CA San Jose, Rose Elctrn. Distrbg. 408-943-0360
CA Sunnyvale, R C Dudek & Co., Inc. 408-734-3830
CA Westlake Village, R C Dudek & Co., Inc. 818-707-1310
CT Wallingford, Midan Elctrns., Inc. 203-265-2077
FL Davie, Arco 305-473-2550
IL Addison, Belford Elctrns., Inc. 312-691-1100
IL Chicago, Leeds Electro Comps. 312-625-3800
IL Schaumburg, QPS Elctrns., Inc. 312-884-6620
MA Middleboro, Glynn Elctrns., Inc. 508-947-4050
OH Dayton, Televox, Inc. 513-454-1225
OR Beaverton, Rose Elctrn. Distrbg. Co. .. 503-629-9288
OR Portland, R C Dudek & Co., Inc. 503-620-9330
TX Richardson, Component Technig. Corp. 214-437-2211
WA Seattle, R C Dudek & Co., Inc. 206-772-3224
Can Concord, Ont., Target Elctrns. 416-669-9902
Can Scarborough, Ont., Carsten Elctrns. Ltd. 416-495-7705
Can St. Laurent, Que., Z.E.I. Elctrns., Inc. ... 514-342-6211

IDEAL INDUSTRIES, 4450 Becker Pl., Sycamore, IL 60178, Tel: 815-895-5181, TWX: 910-639-0613; Empl.: 700; *Sls. Mgr.:* Bob Bukowsky

IDEAL PRECISION METER, 214 Franklin St., Brooklyn, NY 11222, Tel: 212-383-6904, TWX: 710-584-2160; FSC No.: 11707;10304-41; Empl.: 150; *Sls. Mgr.:* T. Bell

IDE ASSOCIATES, INC., 35 Dunham Rd., Billerica, MA 01821, Tel: 617-663-6878, TELEX: 4979780; Empl.: 40; *Sls. Mgr.:* James Bender

IDEC CORPORATION, 1213 Elko Drive, Sunnyvale, CA 94089-2211, Tel: 408-747-0550, TELEX: 34-0601, TWX: 910-339-9383, FAX: 408-744-9055; FSC No.: 60886; Empl.: 75; *Sls. Mgr.:* Wallace Baldwin, Natl. Sls. Mgr. ..... **B•1540-1541, 1754-1755**

Local Sales Offices & Reps

AL Birmingham, Bryco Co. 205-672-9760
AZ Phoenix, Western Automation 602-265-2788
AR Jonesboro, Electro-Tech, Inc. 501-932-0366
CA Laguna Hills, Western Automation 714-859-6988
CA Sunnyvale, Idec Corp. 408-747-0550
CO Lakewood, T.M.M.I. 303-232-1516
FL West Palm Beach, Boggs & Assocs. .. 407-478-8062
FL Oldmar, Boggs & Assocs. 813-855-1812
IL Schaumburg, Idec Corporation 312-882-7887
IL South Barrington, Bu-Nell Engrg. 312-551-9000
IN Indianapolis, Liberty Sls. 317-888-8396
KS Overland Park, TMW 913-383-1818
MA Norwood, Hyland Assocs. 617-762-0345
MI Farmington, Schiller- McBride Assoc. 313-553-0100
MN Minnetonka, S. J. Collins & Assocs. ... 612-933-7661
MO St. Louis, TMW Co. 314-664-4005
NM Albuquerque, T.M.M.I. 505-298-6893
NY Patchogue, Optimum Sls. Co. 516-758-0644
NY Syracuse, Lachut Elctrl. Sls. Inc. 315-458-6480
NC Kernersville, Heritage Sls. Assocs. 919-996-4374
OH Cincinnati, James Murray & Assocs. .. 513-574-8500
OH Cleveland, Matthew Haley Co. 216-892-1820
OH Perrysburg, Matthew Haley Co. 419-874-0488
OK Tulsa, Don Plummer Sls. Co. 918-835-0979
OR Portland, SPS Elctrns. 503-297-6919
PA Cuddy, Brown-Yates Elec.Equip. Co. .. 412-221-4200
PA Philadelphia, Fite-Walker, Inc. 215-233-2100
SC Taylors, Heritage Sls. Assocs. 803-292-1723
TN Knoxville, Tubbs Agy. 615-577-0689
TN Memphis, Electro-tech 901-372-4550
TX Dallas, SW Mktg. Assocs. 214-341-8631
TX Houston, SW Mktg. Assocs. 713-537-8166
UT Salt Lake City, T.M.M.I. 801-487-7676
VA Alexandria, T.D.I. 703-971-8982
VA Richmond, Dunnington & Assocs. 804-282-8383
WA Redmond, SPS Elctrns. 206-323-4140
WI Appleton, Bu-Nell Engrg. 414-733-4242
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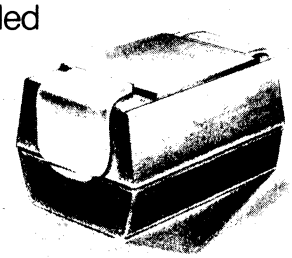

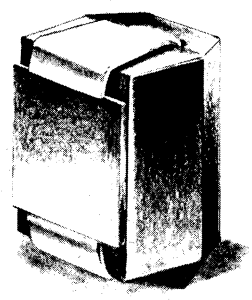

ICS MFG
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CA 800/247-7864
714/491-8888
FAX 714/491-2292

IDENTATRONICS, INC., 425 Lively Blvd., Elk Grove, IL 60007, Tel: 312-437-2654, 1-800-323-5403, TELEX: 754319 CARD UD, FAX: 312-437-2660; *Sls. Mgr.:* Gregg Powell

IEC ELECTRONICS, 105 Norton St., Newark, NY 14513, Tel: 315-331-7742, TWX: 910240, ESYLNK: 6290-2827, FAX: 315-331-3547; Empl.: 850; *Sls. Mgr.:* Frank Montabana; *Dist. Mgr.:* Frank Montabana

FAX: 818-901-9046

IEE (INDUSTRIAL ELECTRONIC ENGINEERS), 7740 Lemona Ave., Van Nuys, CA 91405, Tel: 818-787-0311, TELEX: 6831955IEE INT; Empl.: 425; *Sls. Mgr.:* R. Nisar ..... **B•1087**

Local Sales Offices & Reps

AL	Huntsville, DHR Mktg., Inc.	205-722-0440
AL	Huntsville, TMA Technlg. Mktg. Assocs.	205-883-7893
AZ	Phoenix, Howe & Howe Sls., Inc.	602-264-7971
CA	Brea, Masco Elctrns., Inc.	714-529-0866
CA	Campbell, LCO Tech. Sls.	408-378-9900
CA	Los Angeles, Masco Elctrns., Inc.	714-529-0866
CA	Vista, Masco Elctrns., Inc.	619-758-5562
CO	Lakewood, Cristee-Meade Co.	303-232-0287
CA	San Jose, Class One Elctrns.	408-297-8666
CT	North Haven, Kitchen & Kutchin, Inc.	203-239-0212
FL	Largo, TMA Technlg. Mktg. Assocs.	813-541-1591
FL	Melbourne, TMA Tech. Mktg. Assocs.	407-676-3776
FL	Orlando, TMA Tech. Mktg. Assocs.	407-857-3760
FL	Pompano Beach, TMA Tech. Mktg. Assocs.	305-977-9006
GA	Duluth, DHR Mktg., Inc.	404-564-0529
GA	Norcross, TMA Tech. Mktg. Assocs.	404-446-3565
IL	Arlington Hgts., Phoenix Elctrn. Sls.	312-394-4422
IL	Highland Park, Bransky Sls.	312-433-2375
IN	Indianapolis, Wilson Tech. Sls.	317-872-2513
KS	Lenexa, Midtec	913-541-0505
MD	Hunt Valley, Marktron, Inc.	301-628-1111
MD	Rockville, Marktron, Inc.	301-251-8990
MA	Burlington, Kitchen & Kutchin, Inc.	617-229-2660
MI	Southfield, L. H. Dickelman Co.	313-353-8210
MN	Burnsville, 2M Sales, Inc.	612-890-7774
NY	N. Syracuse, Advanced Comps. Corp., Inc.	315-699-2671
MO	St. Louis, Midtec	314-275-8666
NC	Raleigh, DHR Mktg., Inc.	919-829-1979
OH	Richfield, Geotronix, Inc.	216-659-6100
OH	Trotwood, Geotronix, Inc.	513-854-5939
OR	Beaverton, Olson Tech. Sls. Corp.	503-643-9488
PA	Allison Pk., Geotronix, Inc.	412-487-1770
PA	Norristown, RJI	215-631-1414
SC	Greenville, DHR Mktg., Inc.	803-235-3594
TX	Dallas, MGR Elctrns., Inc.	214-238-5246, 713-759-0187
VA	Springfield, Pantech	703-451-5700
WA	Bellevue, Olson Tech. Sls. Corp.	206-883-7792
WI	Cedarburg, Bransky Sls.	414-377-6837

Local Distributors

AL	Birmingham, American Elctrns.	205-942-4656
AL	Huntsville, Component Distr.	205-883-7501
AZ	Phoenix, Tri-Tek, Inc.	602-371-0860

AZ	Tempe, Circuit Specialist Co.	602-966-0764
CA	Garden Grove, Richey/Western Elctrns.	714-895-0060,800-227-0060
CA	Gardena, California Switch & Signal Co.	213-538-9830
CA	Industry, Ital Elctrn. Sls., Inc.	818-968-8515, 714-990-0922
CA	Lakeside, Mouser Elctrn. Corp.	619-449-2222
CA	San Diego, Richey/Western Elctrns.	619-271-4511
CA	San Jose, Richey/Western Elctrns.	408-727-7411
CA	Santa Monica, Master Distrs.	213-452-1229
CA	Sunnyvale, Penstock	408-727-1200
CA	Sunnyvale, Target Elctrns. Inc.	408-734-5611
CO	Denver, Integrated Elctrns.	303-292-6121
CT	East Haven, J. V. Elctrns.	203-469-2321
CT	Wallingford, Cronin Elctrns.	203-265-3134
FL	Altamonte Springs, Pioneer Technlgs. Grp., Inc.	407-834-9090,800-432-6094
FL	Miami, Elctrn. Equip. Co., Inc.	305-871-3500, 800-432-1235
IL	Bensenville, Voyager Elctrns. Corp.	312-860-1300
IL	Chicago, Bell Inds.	312-640-1910
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Elgin, Allied Elctrns.	312-697-8200
IL	Elmhurst, Semiconductor Specialists, Inc.	312-279-1005
IL	Northbrook, Classic Comps.	312-272-9650
IN	Carmel, Altex Elctrns., Inc.	317-848-1323, 800-692-6039
MD	Gaithersburg, Pioneer Technlgs. Grp., Inc.	301-921-0660
MD	Jessup, Treeko Elctrns., Inc.	301-792-0112
MA	Billerica, Mayer Co., Inc.	508-667-6900
MA	Needham, Cronin Elctrns., Inc.	617-449-5000
MI	Grand Rapids, S-F Elctrn. Supp. Inc.	616-459-0216
MI	Southfield, Michigan Lectrols Corp.	313-353-1350, 800-445-5714
MN	Minneapolis, Stark Elctrns.	612-332-1325
MO	Maryland Hgts., Chelsea Inds.	314-997-7709
NJ	Randolph, Mouser Elctrn. Corp.	201-328-3322
NM	Albuquerque, Betatron Elctrns.	505-821-1122
NM	Albuquerque, Intl. Elctrns.	505-291-9951
NY	Farmingdale, Pride Elctrns.	516-293-4020
NY	Farmingdale, S.A.I.	516-293-2710
NY	Mamaroneck, Logicomp Elctrns.	914-698-9332
NY	Rochester, Masline Elctrns.	716-546-5373
NC	Greensboro, Hammond Elec.	919-275-6391
NC	Raleigh, So. Eastern. Elctrns.	919-828-2311
NC	Winston-Salem, Kirkman Elctrns.	919-722-9131
OH	Cleveland, Alpha Distr. Corp.	216-659-7100
OH	Dayton, The Stotts-Friedman Co.	513-298-5555
OK	Oklahoma City, Electro Entrs., Inc.	405-427-6591
PA	Philadelphia, Herbach & Rademan, Inc.	215-426-1700
PA	Philadelphia, PEI/Genesis Elctrns.	215-673-0400
SC	Greenville, EMSCO	803-233-4121
SC	Taylors, Cantrell Whls.	803-268-1194
TN	Knoxville, MAC-1	615-966-4143
TX	Austin, Southwest Elctrns.	512-837-8971
TX	Austin, The Altair Co.	512-837-4490
TX	Farmers Branch, Force Elctrns. Inc. of Texas	214-247-9955
TX	Fort Worth, Allied Elctrns.	817-336-5401
TX	Houston, Force Elctrns. Inc. of Texas	713-561-8644
TX	Houston, The Altair Co.	713-462-3029
TX	Mansfield, Mouser Elctrn. Corp.	817-483-4422
TX	Richardson, Southwest Elctrns.	214-234-3050
TX	Richardson, The Altair Co.	214-231-5166
TX	Stafford, Southwest Elctrns.	713-240-4000
WI	Milwaukee, Marsh Elctrns.	414-475-6000

IEI-ISKARA ELECTRONICS INC., INC, See Iskara Electronics, Inc.

IERC, 135 W. Magnolia Blvd., Burbank, CA 91502, Tel: 213-849-2481, TWX: 910-498-2206, ESYLNK: 62951515, FAX: 818-848-8872; FSC No.: 98978; Empl.: 97; *Sls. Mgr.:* Dan Ketchum; *Dist. Mgr.:* Ken McPherson .... **C•1661-1663**

Local Sales Offices & Reps

AL	Huntsville, Murcota Corp.	205-539-8476
AZ	Scottsdale, BSE Inc.	602-483-0373
CA	Fremont, Vic/Tal Sls.	415-651-6420
CA	San Diego, Coastal Elctrn. Sls.	619-459-4148
CA	Santa Clara, Ross Mktg. Assocs.	408-988-8111
CA	Sherman Oaks, Wes-K Assoc., Inc.	818-990-1302
CO	Denver, Elcom, Inc.	303-337-2300
FL	Boca Raton, Sls. Specialties	305-395-5371
FL	Plant City, Sls. Specialists	813-754-1329
FL	Temple Terrace, Sls. Specialists	813-988-0561
IL	Mt. Prospect, Magnuson & Assocs.	312-956-0700
IN	Indianapolis, Magnuson & Assocs.	317-247-5108
KS	Leawood, Thunderbird Tech. Sls. & Svcs., Inc.	913-642-7220
KS	Wichita, Thunderbird Tech. Sls.	316-684-3941
MA	Lexington, Hathaway Elctrns., Inc.	617-861-7010
MN	Minneapolis, Magnuson Assocs.	612-521-1235
MO	Maryland Heights, Thunderbird Tech. Sls. & Svcs., Inc.	314-567-6488
NJ	Wayne, G. T. Assocs., Inc.	201-694-6040
NM	Albuquerque, Rep New Tech	505-293-2582
NY	Rochester, Ossman Comp. Sls. Corp.	716-424-4460
NY	Syracuse, Ossman Comp. Sls. Corp.	315-437-7052
NC	Winston-Salem, Murcota Corp.	919-722-9445
OH	Cleveland, Norm Case & Assocs.	216-333-0400
OR	Portland, Frank Jackson & Assocs.	503-645-8511
PA	Philadelphia, Kenneth B. Erdman Co.	215-224-1833
TX	Carrollton, Connec-Tek	214-245-1266
TX	Houston, Barry Sls., Inc.	713-784-5860
TX	Richardson, Barry Sls., Inc.	214-234-0255
UT	Salt Lake City, Elcom, Inc.	801-485-7415
WA	Redmond, Frank Jackson Assocs.	206-881-7277
WI	Milwaukee, Magnuson Assocs.	414-933-8344
Can	Burlington, Ont., White Radio Ltd.	416-632-6894
Can	Montreal, Que., White Radio Ltd.	514-481-0158

Local Distributors

AZ	Phoenix, Arizona Comps. Co.	602-269-5655
CA	Anaheim, DECO Electronics, Inc.	714-630-8252
CA	Canoga Pk., Tim-Co Comp. Sls.	818-992-5040
CA	Chatsworth, Jacon Fasteners & Elctrns.	818-700-2901
CA	Chatsworth, Mil-Comm Distrs.	213-998-3111
CA	City of Industry, Ital Elctrns.	818-968-8515
CA	San Diego, Deco Elctrns.	619-693-1595
CA	San Diego, Timco Sls.	619-236-1161
CA	San Jose, Rose Elctrns.	408-263-9700
CA	Sautee, Mouser Elctrns.	619-449-2222
CA	Sunnyvale, Power Supply Components	408-737-1333
CO	Englewood, Indelco	303-694-9444
CT	Bridgeport, Park Distrs., Inc.	203-366-7200
FL	Clearwater, Lynch Gentry Assocs.	813-433-2697
FL	Winter Park, Distributor Sls.	407-647-8164
IL	Mt.Prospect, Magnuson & Assocs.	312-956-0700
MD	Towson, Jones-Maryland Elctrns.	301-823-5721
MA	Billerica, A. W. Mayer Co., Inc.	617-229-2255
NJ	Randolph, Mouser Elctrns.	201-328-3322
NY	Bohemia, Car-Lac Elctrn. Indl. Sls.	516-567-4200
NY	E. Syracuse, Modutex Corp.	315-437-7052
NY	West Hempstead, March Elctrns.	516-485-4700
OH	Englewood, Argent Inds., Inc.	513-836-8633
OR	Portland, United Radio Supp.	503-233-5341
PA	McKeesport, Barno Radio	412-751-5966
RI	Providence, William Dandreta & Co.	401-861-2800
TX	El Paso, ERA	915-855-3600
TX	Houston, Lenert Co.	713-225-1465
TX	Mansfield, Mouser Elctrns.	817-483-4422
WA	Seattle, Rose Elctrns.	206-721-4997
WA	Seattle, United Radio Supp.	800-547-4557
WA	Spokane, Rose Elctrns.	509-624-8867

FAX: 516-334-5988

IET LABS, INC., 534 Main St., Westbury, NY 11590, Tel: 516-334-5959; FSC No.: 62015; *Sls. Mgr.:* Sam Sheena ..... **D•1286-1293**

IFR SYS. INC., 10200 W. York St., Wichita, KS 67215, Tel: 316-522-4981, TWX: 910-741-6952, FAX: 316-524-2623; Empl.: 700; *Sls. Mgr.:* T. Dideum

FAX: 516-567-7358

ILC DATA DEVICE CORP., 105 Wilbur Pl., Bohemia, NY 11716, Tel: 516-567-5600, TWX: 310-685-2203; FSC No.: 19645; Empl.: 910; *Sls. Mgr.:* J. P. Sheahan; *Dist. Mgr.:* Marshall Lacoff ..... **D•1182-1183**

Local Sales Offices & Reps

AL	Huntsville, Montgomery Mktg.	205-830-0498
AZ	Scottsdale, Fred Board Assocs.	602-994-9388
AZ	Tuscon, Fred Board Assocs.	602-299-1508
CA	Fallbrook, Gary Chilcote & Assocs.	619-728-7678
CA	Garden Grove, ILC Data Dvcs. Corp.	714-895-9777
CA	Santa Clara, ILC Data Dvcs. Corp.	408-244-0831
CA	Woodland Hills, ILC Data Dvcs. Corp.	818-992-1772

CO Englewood, Quorum 3 Sls. Grp. 303-799-8100
CT Canton Center, Dynamic Sls. of New Eng. 203-693-6567
FL Clearwater Beach, Perrott Assocs. 813-443-5214
FL Orlando, Perrott Assocs. 407-298-7748
FL W. Palm Beach, Perrott Assocs. 407-790-5722
GA Norcross, Montgomery Mktg., Inc. 404-447-6124
IL Des Plaines, Elctrn. Mktg. 312-298-2330
IN Carmel, Giesting & Assocs. 317-844-5222
KS Lenexa, Dytec/South 913-888-0215
KS Wichita, Dytec South, Inc. 316-945-7090
MD Frederick, ILC Data Dvc. Corp. 301-898-3121
MA Burlington, Dynamic Sls. of New Eng. 617-272-5676
MI Coloma, Giesting & Assocs. 616-468-4200
MI Comstock Pk., Giesting & Assocs. 616-784-9437
MI Livonia, Giesting & Assocs. 313-478-8106
MN Eden Prairie, Comprehensive Tech. ... 612-941-7181
MO Maryland Hgts., Dytec/South 314-739-0665
NJ Totowa, ILC Data Dvcs. Corp. 201-785-1734
NM Albuquerque, Nelco Electronix 505-293-1399
NY E. Rochester, Tri Tech Elctrns. 716-385-6500
NY Endwell, Tri Tech Elctrns. 607-754-1094
NY Fayetteville, Tri Tech Elctrns. 315-446-2881
NY Fayetteville, Tri-Tech Elctrns, Inc. 315-446-2881
NY Fishkill, Tri Tech Elctrns. 914-897-5611
NC Cary, Montgomery Mktg., Inc. 919-467-6319
NC Raleigh, Montgomery Mktg; Inc. 919-851-0010
OH Cincinnati, Giesting & Assocs. 513-385-1105
OH Cleveland, Giesting & Assocs. 216-261-9705
OH Dayton, Lionel Fedotin 513-275-9345
OK Tulsa, Bonser-Philhower Sls. 918-744-9964
OR Portland, Venture Elctrns. 503-624-0617
PA E. Lancaster, Electro Rep 717-299-5877
PA Pittsburgh, Giesting & Assocs. 412-963-0727
TX Austin, Bonser-Philhower Sls. 512-346-9186
TX Houston, Bonser-Philhower Sls. 713-782-4144
TX Richardson, Bonser-Philhower Sls. 214-234-8438
UT Salt Lake City, Quorum 3 Sls. Grp. 801-943-9227
VT Burlington, Dynamic Sls. of New Eng. 802-863-6665
VA Vienna, ILC Data Dvcs. Corp. 703-893-7989
WA Bellevue, Venture Elctrns. 206-454-4594
WI Waukesha, Electron Mktg. 414-547-1505
Can Montreal, Repco Engrg. 514-694-1877
Can Ontario, Repco Engrg. Co., LTD 416-670-1459

ILC TECHNOLOGY, INC., 399 Java Dr., Sunnyvale, CA 94089, Tel: 408-745-7900, TWX: 910-339-9389; *Sls. Mgr.:* Lynn Reiter

ILLINOIS CAPACITOR, INC.

FAX: 312-673-2850

ILLINOIS CAPACITOR, INC., 3757 W. Touhy Ave., Lincolnwood, IL 60645, Tel: 312-675-1760, TELEX: 72-4361; Empl.: 64; *Sls. Mgr.:* C. Kurland .... **A•1080-1081**

Local Sales Offices & Reps

AL Huntsville, Electramark 205-830-4400
AR Little Rock, Doby Assocs., Inc. 501-221-0326
CA San Jose, Arnold Tech. Sls., Inc. 408-954-0400
CA Woodland Hills, Illinois Capacitor, Inc. 800-323-3652
CO Denver, Lindberg Co. 303-758-9033
CT Bristol, Technlg. Prods. Grp. 203-585-1643
FL Clearwater, H.H.P. Assocs., Inc. 813-797-4447
FL Pompano Bch., HHP & Assocs. 305-971-5750
FL Winter Pk., H.H.P. Assocs., Inc. 407-740-0320
GA Norcross, Electramark 404-446-7915
IL Lincolnwood, Illinois Capacitor, Inc. ... 312-675-1760
IN Greenwood, Valentine & Assocs. 317-888-2260
IN South Bend, Valentine & Assocs. 219-288-7070
IA Marion, AEM, Inc. 319-377-1129
KS Lenexa, AEM Inc. 913-888-0022
MA Brookline, Technology Prods. Grp. 617-731-0858
MI Farmington Hills, Tritech Sls. Inc. 313-553-3370
MI Kalamazoo, Tritech Sls. Inc. 616-382-5570
MN Golden Valley, Highland Elctrn. Sls. Co. 612-545-2123
MS Jackson, Doby Assocs. 601-981-1138
MO Bridgeton, AEM, Inc. 314-298-9900
MO Hazelwood, AEM, Inc. 314-731-2240
MO Hazelwood, Jim Moore & Assocs. 314-731-2240
MO Kansas City, AEM, Inc. 816-758-0262
NJ Englewood Cliffs, Masin-Esco, Inc. 201-569-8868
NM Albuquerque, Lindberg Co. 505-881-1006
NY Clinton, Advanced Comps. Corp. 315-853-6438
NY Endicott, Advanced Comps. Corp. 607-785-3191
NY Hauppauge, Masin-Esco, Inc. 516-273-3500
NY N. Syracuse, Advanced Comps. Corp. 315-699-2671
NY Rochester, Advanced Comps. 716-544-7017
NY Scottsville, Advanced Comps. Corp. 716-889-1429
PA Narberth, J. Bresson Assocs. 215-664-6460
TX Austin, A-I-D Elctrns. 512-450-1938
TX Irving, A-I-D Elctrns. 214-790-4761
UT Salt Lake City, Lindberg Co. 801-277-2643
VA Forest, Bresson Assocs. 800-523-5512
WI Milwaukee, Erdman Sls. Co. 414-281-1330

Local Distributors

AL Huntsville, Hammond Elctrns. 205-830-4764
AZ Phoenix, Arizona Comps. Co. 602-269-5655
AR Ft. Smith, Carlton Bates 501-646-8201
AR Little Rock, Carlton Bates 501-562-8100
AR Pine Buff, Carlton Bates 501-535-1354
AR Springdale, Carlton Bates Co. 501-756-5012
CA Anaheim, A to Z Elctrns. 714-632-1620
CA Canoga Park, Myco Elctrn. Supp. 818-340-2025
CA Huntington Bch., Capacitor Specialtists Intl. 714-843-1815
CA Milpitas, California Capacitor 408-262-6000
CA Milpitas, Projections Unltd. 408-942-1717
CA San Diego, Neumann Elctrns. 619-695-3005
CA San Diego, Projections Unltd. 619-453-7900
CA Tustin, Projections Unltd. 714-544-2700
CO Colorado Springs, Kimball Elctrns. 719-528-7066
CO Englewood, Indelco 303-694-9444
CO Englewood, NEP Elctrns. 303-799-9898
CT Wallingford, Midstate Elctrns. 203-265-9900
FL Ft. Lauderdale, Hammond Elctrns. 305-973-7103
FL Melbourne, G.R.S./Rome Elctrns. 407-242-8151
FL Orlando, Hammond Elctrns. 407-841-1010
GA Norcross, Hammond Elctrns. 404-449-1996
ID Boise, Kimball Elctrns. 208-342-3559
ID Pocatello, Kimball Elctrns. 208-232-2201
IL Northbrook, Classic Comps. 312-272-9650
IL Wood Dale, NEP Elctrns. 312-595-8500
IN Carmel, ALD 317-848-1323
KS Wichita, RSC Elctrns. 316-267-5213
LA Shraveport, Carlton Bates 318-636-9975
MD Beltsville, Resco/Washington 301-937-9100
MD Columbia, G.R.S. Elctrns. Co. Inc. 301-995-6744
MA Hopkinton, ADD Elctrns. Corp. 617-435-5010
MA Woburn, Lorcor 617-935-5024
MI Grand Rapids, Calder Elctrns. 616-698-7400
MN Eitzen, Capacitor Assocs. 507-495-3306
MN Fridley, Voyager Elctrns. 612-571-7766
MN Minneapolis, Bergquist Co. 612-835-2322
MO Kansas City, Walters Indl. Supp. 816-531-7015
MO Springfield, Carlton Bates 417-862-1699
MO St. Charles, Finnigan Elctrns. 314-946-6201
NJ Camden, G.R.S. Elctrns. Co., Inc. 609-964-8560
NJ Clifton, J-Mar Elctrns. 201-772-6400
NJ Roselle, Lectron Ind. 201-245-5859
NY Buffalo, Summit Distrbg. 716-887-2829
NY Elmsford, Ancar Elctrns. 914-592-7100
NY Hauppauge, Broadline Elctrns. 516-231-4100
NY Johnson City, Help Elctrns. 607-729-3528
NC Greensboro, Hammond Elctrns. 919-275-6391
OH Akron, AESCO Elctrns. 216-762-8818
OH Centersville, ALD 513-436-0067
OH Cincinnati, Hughes-Peters, Inc. 513-351-2000
OH Cincinnati, URI 513-761-4030
OH Columbus, AESCO Elctrns. 614-882-6762
OH Columbus, Hughes-Peters, Inc. 614-294-5351
OK Oklahoma City, Carlton Bates 405-681-4446
OK Tulsa, Altair Elctrns. 918-252-5781
OK Tulsa, Carlton Bates 918-250-1626
PA Exton, VSH Elctrns. 215-363-2250
PA Reading, G.R.S. Elctrns. Co., Inc. 215-375-4477
TN Memphis, Carlton Bates 901-365-3539
TN Nashville, Carlton Bates 615-244-3582
TN Richardson, RSC Elctrns. 214-644-3444
TX Austin, Altair Elctrns. 512-837-4970
TX Houston, Altair Elctrns. 713-462-3029
TX Richardson, Altair Elctrns. 214-231-5166
TX Texarcana, Carlton Bates 214-792-6923
UT Salt Lake City, Kimball Elctrns. 801-328-2075
WA Bothell, Projections Unltd. 206-485-2147
WI Milwaukee, Badger Capacitor Sls. 414-281-1330
WI New Berlin, Classic Comps. Supp. Co. 414-786-5300
WI New Berlin, NEP Elctrns. 414-785-9100

Illinois Lock

FAX: 312-537-1881

ILLINOIS LOCK CO., The Eastern Co., 301 W. Hintz Rd., Wheeling, IL 60090, Tel: 312-537-1800, TWX: 910-651-0221; Empl.: 120 ..... **B•1756-1757**

ILP MFG. INC., 250 Wildcat Rd., Downsview, Ont., CAN M3J 2N5, Tel: 416-667-9914, FAX: 416-667-8928; Empl.: 25; *Sls. Mgr.:* Howard Gladstone ..... **A•2310-2311; D•1012**

Local Sales Offices & Reps

AZ Scottsdale, Mayfield Mktg., Inc. 602-998-3142
CA Burbank, Darco-De Angelo, Rothman & Co. 818-504-2425
FL Deerfield Beach, Jack Krutech & Assocs., Inc. 305-427-4202
GA Tucker, Stephen & Assocs., Inc. 404-493-4666
IL Park Ridge, Bob Burns & Assocs. 312-823-9260
MA Hingham, Shain Assocs., Inc. 617-740-2334
NH Nashua, Shain Assocs., Inc. 603-881-4881
NC Raleigh, Eastern Elctrns. 919-876-7591
OH Dayton, J.C. Hofstetter Co. 513-296-1010
OR McMinnville, Electro-Design 503-472-0481
TX Lewisville, Jim Hughes Co. 214-221-1536
WA Redmond, Electro Design 206-868-7400

IMAGE GRAPHICS, INC., 917 Bridgeport Ave., Shelton, CT 06484, Tel: 203-926-0100, FAX: 203-926-9705; FSC No.: 5M867; Empl.: 100; *Sls. Mgr.:* Putnam Morgan

IMAGING & SENSING TECHNOLOGY CORP., Westinghouse Circle, Horseheads, NY 14845, Tel: 607-796-3372, TWX: 510-252-1588, FAX: 607-796-3279; Empl.: 360

FAX: 602-790-2808

I.M.C., (International Microtronics Corp.), 3930 E. Tennessee St., Tuscon, AZ 85714, Tel: 602-748-7900, 1-800-433-3767 ..... **D•1398-1401**

Local Sales Offices & Reps

IL KTEK 312-635-9612
LA RE Owens, Inc. 504-888-5813

Local Distributors

CA Tech-Ser, Inc. 415-496-1004
CA Tech-Ser, Inc. 213-370-7200
DE Electra-Tech 301-877-0344
IL Data Elctrns. 800-621-8288
IL Data Elctrns. 312-283-0300
IL Pacific Inds. 312-352-3500
IN Data Elctrns. 317-359-5388
IA Data Elctrns. 800-521-8278
MA Calibron Instrs. 617-894-8440
MN Data Elctrns. 612-559-1434
NJ Electra-Tech 215-245-7455
NY Masline Elctrns.,Inc. 716-546-5373
OR H.I.S. 503-643-5648
TX Seaton Corp. 214-980-9860
TX Textrol, Inc. 214-484-9961
VA Meter Metrics 804-275-1431
WI Data Elctrns. 800-621-8276

IMC MAGNETICS CORP., Arizona Div., 1900 E. Fifth St., Tempe, AZ 85281, Tel: 602-968-4441, TWX: 910-951-0001, FAX: 602-968-5026; *Sls. Mgr.:* Joseph Gute

IMC MAGNETICS CORP.

FAX: 516-938-0752

IMC MAGNETICS CORP., Exec. Off., 100 Jericho Quadrangle, Ste. 221, Jericho, NY 11753, Tel: 516-938-0800, TWX: 510-221-2126; Empl.: 1,300; *Sls. Mgr.:* R. Kintner

IMC MAGNETICS CORP., Eastern Div., 570 Main St., Westbury, NY 11590, Tel: 516-334-7070, TWX: 510-222-4469, FAX: 516-334-7723

IMC MAGNETICS CORP., Florida Division, 14025 N.W. 60th Ave., Miami Lakes, FL 33014, Tel: 305-822-2558, FAX: 305-825-3850

IMC MAGNETICS CORP., IMC/Hansen, Box 23, Princeton, IN 47670-0023, Tel: 812-385-3415, FAX: 812-386-6387; *Sls. Mgr.:* George A. Gilbert

IMC MAGNETICS CORP., Thermal Products Group., 100 Jericho Quad., Ste. 221, Jericho, NY 11753, Tel: 516-938-0800, TWX: 510-221-2126, FAX: 516-938-0752; *Sls. Mgr.:* R. Lavochkin

IM/D CORP., 540 Commercial St., Manchester, NH 03101, Tel: 603-669-5224, FAX: 603-669-3826; Empl.: 12; *Sls. Mgr.:* Frank N. Haigh

IMEC CORP., 3065 Beyer Blvd., San Diego, CA 92154, Tel: 619-690-2622; Empl.: 1400; *Sls. Mgr.:* R. L. Hill

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IMPERIAL ASTRONICS, Meridian Intl. Corp., 19151 Parthenia St. J, Northridge, CA 91324, Tel: 818-886-7672; Empl.: 38; *Sls. Mgr.:* Laurie Lee, GM ..... **A•1951**

Local Sales Offices & Reps

CA American Canyon, Jacobson & Assocs. 707-552-4412

I.M.S. EQUIPMENT, INC., See Worldnet Marketing, Inc.

IMTRONICS INDUSTRIES, 11930 31st Ct. N., St. Petersburg, FL 33716, Tel: 813-572-9010, TELEX: 566027 IMTRON CWTR UD, FAX: 813-572-9012; Empl.: 10; *Sls. Mgr.:* Steven B. Cohen

INCONIX CORP, See Hancock Electronics Corp.

ELINA

FAX: 408-433-9330

INDEK CORPORATION, 2360 Qume Dr., No. A, San Jose, CA 95131, Tel: 408-432-1199, TELEX: 176476ELINA; Empl.: 7; *Sls. Mgr.:* Charles Granata; *Dist. Mgr.:* Anke Vanoverbeek ..... **C•1664-1668**

Local Sales Offices & Reps

AZ	Phoenix, CPS Assocs., Inc.	602-246-1097
CA	San Diego, K-Tronics	619-549-7155
CA	San Jose, Veer Mktg.	408-432-1818
CA	Tustin, C & N and Assocs., Inc.	714-730-9137
CA	Valencia, C & N Assocs. Inc.	805-254-5844
CO	Denver, AKI Entprs.	303-388-4488
GA	Norcross, Mountain Electro Mktg.	404-448-5594
ID	Boise, N.R. Schultz Co.	208-377-8686
IN	Granger, Gregory Sls. Co.	219-272-9626
MA	Topsfield, Liberty Electro Mktg.	508-887-6655
MI	Brighton, A.P. Assocs.	313-229-6550
MO	Florissant, Deltron Co., Inc.	314-839-0033
NJ	Cherry Hill, Vantage Sls. Co.	609-424-6777
NY	Glen Cove, Dyno-Rep	516-676-1598
OH	Columbus, Tom Mulligan Co.	614-457-2242
OH	Dayton, Tom Mulligan Co.	513-254-0202
OK	Tulsa, Comptech	918-622-7744
OR	Beaverton, N.R. Schultz Co.	503-643-1644

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IL	Chicago, Brock & Cushman	312-622-4110
TX	Austin, Comptech	512-343-0300
TX	Houston, Comptech	713-492-0005
TX	Irving, Comptech	214-751-1181
VA	Front Royal, Eltron Sls. Inc.	703-635-7201
WA	Bellevue, N.R. Schultz Co.	206-454-0300
WA	Redmond	
Can	Brampton, Ont., Designtronics	416-793-5155

Local Distributors

AZ	Tempe, Harper S.I.D.	602-967-1464
CA	Compton, Harper SID	213-979-5090
CA	Fremont, Terminal Sls. Corp.	415-656-7722
CA	San Diego, Harper SID	619-578-2500
CA	San Jose, Compass Comps.	408-432-7575
CA	San Jose, Harper SID	408-943-9490
GA	Norcoss, Applied Power	404-263-0421
IL	Palatine, OHM Electronics	312-359-5500
MA	Westborough, In-Stock Prod.	508-870-5750
MO	St. Louis, Beckwith Elec.	314-343-6463
NJ	West Berlin, GCI Corp.	609-768-6767
OK	Oklahoma City, Radio Supp. Inc.	405-232-6127
TX	Irving, Harper SID	214-621-0500
WA	Redmond, Priebe Elctrns.	206-881-2363

INDEPENDENT CABLE, INC., 43 Broad St., Hudson, MA 01749, Tel: 617-562-9913; Empl.: 120; *Sls. Mgr.:* Gary W. Nace

Distributor

FAX: 714-978-2411

INDUCTOR SUPPLY, 1849 W. Sequoia Ave., Orange, CA 92668-1017, Tel: 714-978-2277, 800-854-1881, 800-472-8421; Empl.: 32; *Sls. Mgr.:* Neal McDonald, Ruben Ramirez ..... **A•1252**
696, 707, 720, 729, 791, 813

Industrial Computer Designs

FAX: 818-889-1490

INDUSTRIAL COMPUTER DESIGNS, INC., 31264 La Baya Drive, Westlake Village, CA 91362, Tel: 818-889-3179; Empl.: 20; *Sls. Mgr.:* Laura L. Webb, Sls. Mgr./Sr. VP ..... **D•1185**

INDUSTRIAL CONTROL CO., 3100 Pineda Ave., Rockledge, FL 32955, Tel: 407-259-7105; Empl.: 15; *Sls. Mgr.:* I. Nobilio

INDUSTRIAL DEVICES CORPORATION, 35 Pamaron Way, Novato, CA 94949-6284, Tel: 415-883-3535, FAX: 415-883-2094; Empl.: 25

INDUSTRIAL DEVICES, INC., 260 Railroad Ave., Hackensack, NJ 07601, Tel: 201-489-8989, FAX: 201-489-6911; FSC No.: 91802; Empl.: 275; *Sls. Mgr.:* Michael Diceglie ..... **B•1158-1162**

Local Sales Offices & Reps

AL	Huntsville, South Design & Mktg.	205-880-3623
AZ	Phoenix, More Sls., Inc.	602-788-9181
AZ	Tempe, WestRep	602-820-9932
CA	Los Angeles, Universal Comps.	213-641-4255
CA	Santa Clara, WestRep	408-988-8833
CO	Englewood, Harthun Assocs., Inc.	303-792-5050
FL	Casselberry, Dyne-A-Mark Corp.	305-831-2822
FL	Clearwater, Dyne-A-Mark	813-441-4702
FL	Ft. Lauderdale, Dyne-A-Mark Corp.	305-771-0114
IL	Chicago, Rendell Sls. Co. (RSC)	312-539-1820
IN	Indianapolis, Elctrn. Mktg. Consits.	317-253-1668
MD	Columbia, PSA, Inc.	215-245-0513
MA	Westborough, Anchor Engrg.	617-870-0573
MI	E. Detroit, Fred Harris & Assocs.	313-776-5430
MN	Minneapolis, Elec. Comp. Sls.	612-933-2594
MO	Blue Springs, KKB, Inc.	816-229-0001
MO	St. Louis, KKB, Inc.	314-647-2000
NY	Glen Cove, Dyno-Rep	516-676-1598
NY	Rochester, Apex Assocs.	716-254-6050
NC	Raleigh, Spears & Assocs.	919-790-7606
OH	Dayton, J. C. Hofstetter Co.	513-296-1010
OH	Medina, J. C. Hofstetter Co.	216-241-4880
OR	Hillsboro, Temco Northwest	503-649-8375
PA	Hickory, J. C. Hofstetter Co.	412-356-2305
PA	Trevose, PSA, Inc.	215-245-0513
SC	Greenville, Spears & Assocs.	803-877-9088
TX	Austin, R. F. Kimball Co.	512-443-5284
TX	Houston, R. F. Kimball Co.	713-890-8810
TX	Richardson, R. F. Kimball Co.	214-231-3447
WA	Bothell, Temco Northwest	206-821-5434

Local Distributors

AZ	Phoenix, Dalis Elctrn. Supp.	602-275-2885
CA	Fremont, Allied Elctrns.	415-487-5250
CA	Gardena, Calif. Switch & Signal	213-770-2330
CA	Los Angeles, Elec. Switches	213-664-1141
CA	Milpitas, Zack Elctrns.	408-942-5432
CA	S. San Francisco, Steven Engrg.	415-588-9200
CA	Sacramento, Zack Elctrns.	916-446-3131
CA	San Diego, Shanks & Wright	619-239-0176
CA	San Diego, Sigma Elctrns.	714-565-2000
CA	San Francisco, Zack Elctrns.	415-626-1444
CA	San Jose, Quement Elctrns.	408-998-5900
CA	San Jose, Rose Elctrn. Distrbg. Co.	408-943-0255
CA	Santa Ana, Sunray Lighting, Inc.	714-556-3630
CA	Tustin, Allied Elctrns.	714-669-4190
CO	Arvada, Denver Beta	303-431-7161
CO	Denver, Allied Elctrns.	303-790-1662
CO	Denver, Con. Parts	303-623-5313
CT	Bridgeport, Park Distrs.	203-366-7200
CT	Wallingford, Sager Electrical Supp.	203-265-4600
FL	Pompano Bch., Allied Elctrns.	305-978-3008
FL	Tampa, Specialty Distrbg. Co.	813-870-3315
FL	W. Palm Beach, Nurmi Elctrn.	305-686-8553
GA	Atlanta, Wholesale Indl. Elec.	800-282-1857
GA	Norcross, Whitehead Elctrns.	404-923-6667
IL	Elgin, Allied Elctrns.	312-697-8200
IL	Rockford, Mid-West Associated	815-962-8036
IL	Villa Park, Melvin Elctrns.	312-279-5015
IL	Wheeling, Hawk Elctrns.	800-843-4295
IL	Wood Dale, Electro-Kinetics	312-595-6700
IN	East Chicago, ACRO Elctrns.	312-375-1269
IN	Evansville, Hutch & Son	812-425-7201
IN	Fort Wayne, Bell Inds.	219-423-3422
IN	Indianapolis, Bell Inds.	317-634-8202
IN	South Bend, Genesis Elctrns.	219-287-2911
IA	Cedar Rapids, Dee Elctrns.	319-365-7551
KY	Bowling Green, Crescent Elctrns.	502-842-2444
LA	Lafayette, Ralph's	318-234-4507
MD	Rockville, Capitol Radio Whlsrs.	301-881-2270
MA	Hingham, Sager Elec. Supp.	617-749-6700
MA	N. Wilbraham, Indl. Comps.	413-596-3854
MA	Norwood, Gerber Elctrns.	617-329-2400
MA	Worcester, Coghlin Elect.	617-756-8311
MI	Flint, Shand Elctrns.	313-743-8940
MI	Livonia, Shand Elctrns.	517-799-2527
MI	Saginaw, Shand Elctrns.	313-591-3980
MN	Minneapolis, Bergquist Co.	612-835-2322
MN	Minneapolis, Elctrn. Center	612-371-5200
MN	Minneapolis, Stark Elctrns.	612-332-1325
MO	Kansas City, Chelsea Inds.	816-842-8556
MO	Maryland Hgts., Chelsea Inds.	314-997-7709
MO	St. Louis, Van Sickle Radio-Elec.	314-621-5000
NE	Lincoln, Scott Elctrn. Supp.	402-466-8221
NJ	Hanover, State Elctrns. Parts	201-887-2550
NJ	Oakland, Relay Spec.	201-337-1000
NY	Albany, E. E. Taylor Co.	518-438-7811
NY	Buffalo, Summit Distrs.	716-887-2800
NY	Hauppauge, Broadline Elctrns.	516-231-4100
NY	Hauppauge, Sager Elctrl. Supply Co.	516-348-1300
NY	Hempstead, Elctrn. Equip.	800-645-1605
NY	Mt. Vernon, Q.A.R. Indl. Elctrn. Sls.	914-699-2224
NY	Rochester, Simcona Elctrns.	716-328-3230
NY	Rochester, Summit Elctrns.	716-334-8110
NC	Raleigh, Sager	919-850-9550
NC	Raleigh, Southeastern Radio Supp.	919-828-2311
OH	Cincinnati, Hughes-Peters	513-351-2000
OH	Columbus, Hughes Peters	614-294-5351
OH	Dayton, Stotts-Friedman Co.	513-298-5555
OK	Tulsa, PEI Genesis	918-622-8520
OR	Beaverton, Murphy Elctrns.	503-642-2001
OR	Portland, United Radio Supp.	503-233-7151
PA	Erie, REM Elctrns.	814-453-5626
PA	Harrisburg, Cumberland Elctrns.	717-233-5883
PA	Philadelphia, PEI/Genesis	215-673-0400
TN	Memphis, Bluff City Elctrns.	901-345-9500
TN	Nashville, Randolph & Rice	615-255-5601
TX	Ft. Worth, Allied Elctrns.	817-336-5401
TX	Houston, Altair Co.	713-462-3029
TX	Richardson, Altair Co.	214-231-5166
TX	San Antonio, Sherman Elctrns. Supp.	512-224-1004
UT	Salt Lake City, Standard Supp.	801-486-3371
VA	Glen Allen, Hermitage Distrs.	804-798-3830
WA	Redmond, Murphy Elctrns.	206-881-1234
WA	Seattle, Allied Elctrns.	206-547-2827
WA	Spokane, Radar Elec.	509-747-3053
WI	Milwaukee, Marsh Elctrns.	414-475-6000

FAX: 703-731-0847

INDUSTRIAL DRIVES, A Kollmorgen Div., 201 Rock Rd, Radford, VA 24141, Tel: 703-639-2495, TWX: 710-875-3743; FSC No.: 11384; Empl.: 343; *Sls. Mgr.:* Jim Webb/ Robert White Jr./ Robert Foster ... **B•1258-1259**

Local Sales Offices & Reps

CA	Laguna Hills, Industrial Drives	714-581-3626
CA	Milpitas, Maxim Elctrns. Sls.	408-946-6001
CA	Signal Hill, Thorson Co. of So. Calif.	213-595-0361
CO	Longmont, Piper Sls. Co.	303-443-5337
CT	Madison, Tedicko, Inc.	203-644-4330
GA	Atlanta, Industrial Apparatus Co.	404-875-8086
IL	Arlington Hgts., Industrial Drives	312-981-1433
IN	Indianapolis, J.N. Fauver Co.	317-872-3060
MA	Topsfield, Whitehead Assocs.	508-887-8050
MI	Madison Hgts., J.N. Fauver Co.	313-585-5252
MN	New Brighton, The Mackubin Grp.	612-636-5533
MO	St. Louis, Cadon Tech. Co.	314-645-8670
NJ	Paramus, Brundage Assocs.	201-967-7024
NY	E. Rochester, A&D Devices	716-385-2778
NC	Matthews, Industrial Drives	716-821-9875
OH	Chargin Falls, The Kilroy Corp.	216-543-3370
OR	Beaverton, Thorson Co. N.W.	503-644-5900
PA	Media, Homersmith, Inc.	215-543-2434
TX	Dallas, Kruvand Assocs.,Inc.	214-437-3355
UT	Salt Lake City, Piper Sls.	801-466-9336
VA	Radford, The Hatfield Co.	703-639-5471
WA	Bellevue, Thorson Co. N.W.	206-455-9180

INDUSTRIAL ELECTRONIC HARDWARE CORP., (IEH Corp.), 109 Prince St, New York, NY 10012, Tel: 212-677-1881, TWX: 710-581-4338, FAX: 212-674-1048; FSC No.: 97913; Empl.: 250; *Sls. Mgr.:* Louis Roberts; *Dist. Mgr.:* Louis Roberts

INDUSTRIAL ELECTRONICS CORP., 24175 Gibson Drive, Warren, MI 48089, Tel: 313-759-4450, FAX: 313-759-1589; Empl.: 30; *Sls. Mgr.:* Allen A. Russell

INDUSTRIAL INDEXING SYSTEMS, INC., 626 Fishers Run, Victor, NY 14564, Tel: 716-924-9181, FAX: 716-924-2169; Empl.: 30; *Sls. Mgr.:* Raymond F. Coller

Local Sales Offices & Reps

NY	East Rochester, A & D Dvcs.	716-385-2778
PA	Media, Homersmith, Inc.	215-543-2434

Local Distributors

MI	Grand Rapids, Ackerman Elec.	616-459-8327
WI	Oneida, MCL Inds., Inc.	414-434-1500

INDUSTRIAL MIDWEC CAPACITOR CORP., 4902 Tollview Dr., Rolling Meadows, IL 60008, Tel: 312-577-0120, TWX: 910-687-3375, FAX: 312-398-0318; Empl.: 100; *Sls. Mgr.:* T.B. Noone

Powertron

FAX: 516-883-7155

INDUSTRIAL TEST EQUIPMENT, 21 Yennicock Ave., Port Washington, NY 11050, Tel: 516-883-1700; FSC No.: 99074; *Sls. Mgr.:* Jay Monroe ..... **D•1013, 1295, 2208-2212**

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INERTIAL MOTORS, 280 N. Broad St., Doylestown, PA 18901, Tel: 215-345-1010, TELEX: 83-1633; Empl.: 17; *Sls. Mgr.:* Joanne Dorr

INFICON LEYBOLD-HERAEUS, INC., See Leybold Inficon, Inc.

INFINETICS INC., Friskem Div., 201 Vandever Ave., Wilmington, DE 19802, Tel: 302-658-2471, TWX: 510-666-2332; *Sls. Mgr.:* M. Schwartz

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INFODEX, INC., 10 Venus Dr., Wolcott, CT 06716, Tel: 203-879-4944; FSC No.: 09087; Empl.: 48; *Sls. Mgr.:* E. H. Ulm ..... **B•1010-1011, 1088**

INFO-LITE CORP., See Dio-Rey and Crosspoint

INFORMATION CONTROL CORP., 9610 Bellanca Ave., Los Angeles, CA 90045, Tel: 213-641-8520, TWX: 910-328-7234, FAX: 203-368-3747; Empl.: 50

INFORMATION TRANSFER INDL. INC., Box 357, Holcomb, NY 14469, Tel: 716-657-7074, FAX: 716-657-7432; FSC No.: 55137; Empl.: 70; *Sls. Mgr.:* John Dillman ..... **D•1186-1188, 1296-1297**

Local Sales Offices & Reps

AZ	Scottsdale, Luscombe Engrg.	602-949-9333
CA	Montrose, Luscombe Engrg.	818-249-9000
CA	San Diego, Luscombe Engrg.	619-292-4337
CO	Littleton, Pond Assocs., Inc.	303-798-2904
CT	Marion, Polytek Assocs.	203-634-4499
FL	Port Charlotte, John E. Wiseman Co.	813-625-5740
IL	Schaumburg, Kenneth W. Meyers Co.	312-882-4808
IN	Indianapolis, Kenneth W. Meyers Co.	317-783-1030
IA	Cedar Rapids, Kenneth W. Meyers Co.	319-363-8987
MA	Ashland, Polytek Assocs.	617-881-4741
MN	Minneapolis, Kenneth W. Meyers Co.	612-920-7080
NJ	Oxford, Malin Assocs.	201-689-7398
OR	Portland, Tasco J.D.	503-292-1910
PA	Melrose Park, Robert Meyers Assocs.	215-224-1663
TX	Houston, Sci. Sls. Co.	713-460-9170
TX	Richardson, Sci. Sls. Co.	214-231-6541
WA	Bellevue, Tasco	206-453-1414
WI	Brookfield, Kenneth W. Meyers Co.	414-784-3790

INFRARED INDUSTRIES, INC., 12151 Research Parkway, Orlando, FL 32826, Tel: 407-282-7700, FAX: 407-273-9046; Empl.: 50; *Sls. Mgr.:* Lisa Cioffi

INJECTORALL ELECTRONICS (WOMAN OWNED), 110 Keyland Court, Bohemia, NY 11716, Tel: 516-563-3388, FAX: 516-563-3389 ..... **C•1125**

Local Sales Offices & Reps

AL	Birmingham, John F. Russell Co.	205-822-2196

Local Distributors

AL	Birmingham, ACK Radio Supp.	205-322-0588
AZ	Tucson, Electronic City	602-622-1173
CA	San Luis Obispo, Midstate Elctrns. Supp.	805-543-2770
CA	San Rafael, Elctrns. Plus	415-457-0466
CA	Sunnyvale, Halted Specialties	408-732-1573
FL	Jacksonville, Mitchell Elctrns.	904-356-8426
GA	Atlanta, Delta	404-458-4690
IL	Lombard, Tron Elctrns.	312-691-8900
IN	Evansville, Tri-State Supp. Co.	812-423-4257
IA	Cedar Rapids, Iowa Radio Supp. Co.	800-332-5296
KY	Louisville, P.I. Burkes	502-589-3960
MD	Rockville, Capitol Radio Whlsrs.	301-881-2270
MA	Needham, Y.D.I.	617-449-1005
MI	Canton, The Elctrn. Connection	313-595-6655
NY	Endicott, Rogan Elctrns.	607-754-3590
NY	Lindenhurst, RNJ Elctrns.	516-226-2700
NY	Long Island City, Typeco	718-706-6666
NY	Richmond Hill, Anchor	212-846-2420
NC	Charlotte, Slayton Elctrns.	704-375-6600
OK	Oklahoma City, Radio Supp., Inc.	405-332-6127
OR	Beaverton, Norvac	503-644-1025
PA	Philadelphia, H & R Elctrns.	215-426-1700
SC	Charleston, Wholesale Indl. Elctrns.	803-722-2634
TX	Fort Worth, Sweico	817-335-6521
VA	Roanoke, H. C. Baker	703-344-9209

INLAB, INC., 2150-I W. 6th Ave., Broomfield, CO 80020, Tel: 303-460-0103, FAX: 303-469-5565; Empl.: 15; *Sls. Mgr.:* Jerry Short

INLAND MOTOR/KOLLMORGEN, 4020 E. Inland Rd., Sierra Vista, AZ 85635, Tel: 602-459-1150, TELEX: 62858, TWX: 910-973-9869, FAX: 602-458-2161 ..... **B•1260-1265**

INLAND MOTOR, Kollmorgen Corp., 501 First St., Radford, VA 24141, Tel: 703-639-9045, TELEX: 710-875-3740, FAX: 703-731-4193; FSC No.: 11384; Empl.: 500 ..... **B•1260-1265**

Local Sales Offices & Reps

PA	Media, Homersmith, Inc.	215-543-2434
FL	Melbourne, Technlg. Mktg. Assocs.	407-676-3776
FL	Orlando, Technlg. Mktg. Assocs.	407-857-3760
FL	Pompano Bch., Technology Mktg. Assocs.	305-977-9006
AZ	Sierra Vista, Inland Motor	602-459-1150
CT	Meriden, Vanguard Elctrns. Corp.	203-634-3080
VA	Arlington, Homersmith, Inc.	703-522-8459
FL	Largo, Technlg. Mktg. Assocs.	813-541-1591
FL	Orlando, Magna Engrg. Sls.	407-671-8716
MN	St. Paul, Northstar Motion & Control	612-770-5311
NY	Sidney, A & D Dvcs.	607-563-8488
OH	Medina, Cygnus	216-725-1663
PA	Downingtown, Homersmith, Inc.	215-269-3637
PA	Doylestown, Magna Engrg. Sls.	215-345-5111
TX	Richardson, Barger Engrg., Inc.	214-349-6171

Specialty/Instrument/Industrial Drive Group

AL	Huntsville, Technology Mktg. Assocs.	205-883-7893
AZ	Tempe, Thor Engrg.	602-438-8494
CA	Alhambra, Thorson Co. of Southern CA	818-281-2280
CA	Goleta, Thorson Co. of Southern CA	805-964-8751
CA	Mtn. View, Thorson West	415-964-9300
CA	San Diego, Thorson Co. of San Diego	619-292-8525
CA	Signal Hill, Thorson Co. of Southern CA	213-595-0361
CO	Englewood, Thorson Rocky Mt., Inc.	303-799-3435
GA	Norcross, Technlg. Mktg. Assocs.	404-446-3565
IL	Collinsville, Magna Engrg. Sls.	618-345-5583
IL	Elk Grove Vl, Carlson Elctrn. Sls.	312-956-8240
IN	Indianapolis, Precision Elctrns.	317-842-3740
IA	Cedar Rapids, Carlson Elctrn. Sls.	319-378-1450
KS	Wichita, Magna Engrg. Sls.	316-744-0851
MA	Needham Hgts., Vanguard Elctrns. Corp.	617-449-5578
NJ	Wayne, SHL Assocs., Inc.	201-790-1714
NY	E. Rochester, A & D Dvcs.	716-385-2778
NC	Jamestown, Homersmith, Inc.	919-883-3999
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INMOS CORP., P.O. Box 16000, Colorado Springs, CO 80935, Tel: 719-630-4000 (ext 4357), FAX: 719-630-4325; Empl.: 120; *Sls. Mgr.:* Richard Riker; *Dist. Mgr.:* David Bowers

INNOVATEK MICROSYSTEMS, INC., Smithfield Rd., R1 Box 104, Millerton, NY 12546-9720, Tel: 914-373-9003; Empl.: 8; *Sls. Mgr.:* Paul F. Fitts

INNOVATIVE ELECTRONICS, INC., Dynatech Corporation, 10110 USA Today Way, Miramar, FL 33025, Tel: 305-432-0300, FAX: 305-432-0705; Empl.: 37; *Sls. Mgr.:* Marshall Roper

INNOVUS, 1756 Junction Ave., Ste. E, San Jose, CA 95112, Tel: 408-436-7790, FAX: 408-436-8185; Empl.: 15

INRECO, See Ransco Industries

INRESCO, INC., 654 Ocean Road, Pt. Pleasant, NJ 08742, Tel: 201-892-5881; Empl.: 16; *Sls. Mgr.:* P. Swandrak; *Dist. Mgr.:* P. Swandrak

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INSTANT BOARD CIRCUITS GRP., 20 A Pamaron Way, Novato, CA 94949, Tel: 415-883-1717, FAX: 415-883-2626; Empl.: 13

INSTRON CORP., 100 Royall St, Canton, MA 02021, Tel: 617-828-2500, TELEX: 924434; Empl.: 1000; *Sls. Mgr.:* Lawrence Frost; *Dist. Mgr.:* Patrick Heck

INSTRULAB, P.O. B. 98, Dayton, OH 45404, Tel: 513-223-2241; Empl.: 22; *Sls. Mgr.:* Philip C. Alderton

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FAX: 312-543-6244

INSTRUMENTATION & CONTROL SYS., ICS.Inc., 520 Interstate Rd, Addison, IL 60101, Tel: 312-543-6200, TELEX: 271503 ICS UR; Empl.: 50; *Sls. Mgr.:* Donald G. Baltzer; *Dist. Mgr.:* Barbara Martinus .... **D•1147, 2213**

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Timer Representatives

FL Largo, Q Rep 813-393-6393
IL Elmhurst, FF/Hill Gray Assocs. 312-832-4101
IN Indianapolis, EMCI 317-921-3450
MO Blue Springs, A-Tronics 816-224-2131
NJ Whippany, Robert Smith Assocs. 201-540-0204
NY Plainview, Robert Smith Assocs. 704-536-1868
Can Downsview, Ont., EPT Inds. Inc. 416-665-3772

UPS Representatives

FL Largo, Q Rep 813-393-6393
IN Indianapolis, EMCI 317-921-3450
MO Blue Springs, A-Tronics 816-224-2131
TX Houston, Gettys-Eads-Adair 713-827-7155

Local Distributors

AL Huntsville, Allied Elctrns. 800-241-7122
CA Canoga Park, C & A Elctrns. 818-340-6022
CA Hayward, Allied Elctrns. 415-487-5250
CA Tustin, Allied Elctrns. 213-860-0090
MA Wilmington, Allied Elctrns. 617-942-0150
FL Pompano Bch., Allied Elctrns. 305-486-0500
GA Norcross, Allied Elctrns. 404-377-3555
GA Norcross, Automatic Controls Co. 404-447-5644
IL Berwyn, B-B & W, Inc. 312-749-1710
IL Elgin, Allied Elctrns. 312-697-8200
IL Rosemont, Advent Elctrns. 312-297-6200
IA Cedar Rapids, Advent Elctrns. 319-363-0221
IA Indianapolis, Advent Elctrns. 317-872-4910
MD Marlow Hgts., Allied Elctrns. 301-423-0161
MI Farmington Hills, Advent Elctrns. 313-447-1650
MN St. Paul, Powermation 612-645-0781
NY Hauppauge, N & L Instrs. 516-234-9797
NY Mineola, Allied Elctrns. 516-248-2360
NC Raleigh, Allied Elctrns. 800-638-1381
OH Chagrin Falls, Comm-Omni 216-543-1328
OH Warren, REM Elctrn. Supp. Co., Inc. ... 216-373-1300
TX Brownsville, Garden Indl. Grp. 512-546-1612
TX Ft. Worth, Allied Elctrns. 817-336-5401, 214-265-9341
TX Ft. Worth, Allied Export Svcs. 817-336-5401
TX Garland, Powertronics 214-272-4640
WA Seattle, Allied Elctrns. 206-767-2827
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INSTRUMENTATION MEAS. LAB., See Lockheed Electronics Co., Inc.

INSTRUMENTATION SERVICES, INC., 957 Winnetka Ave. N., Minneapolis, MN 55427, Tel: 612-544-8916, FAX: 612-544-4887; Empl.: 30; *Sls. Mgr.:* G. Ryan

INSTRUMENT DESIGN ENGRG. ASSOC., INC., 1300 Pioneer Ste. B, Brea, CA 92621, Tel: 213-697-4332, FAX: 213-690-1352; *Sls. Mgr.:* Deborah K. Blackstone; *Dist. Mgr.:* Deborah K. Blackstone

INSTRUMENT ENCLOSURES, 9767 Glenoaks Blvd., Sun Valley, CA 91352, Tel: 818-768-4622, FAX: 818-767-4988; FSC No.: 62012; Empl.: 28; *Sls. Mgr.:* William B. Taylor

INSTRUMENT RESEARCH CO., Box 40207, Santa Barbara, CA 93103, Tel: 805-962-8336; Empl.: 6

INSTRUMENT RESISTOR CO., See INRESCO/Instr. Resistor

INSTRUMENTS, INC., 7263 Engineer Rd., Ste. G, San Diego, CA 92111, Tel: 619-571-1111, TELEX: 910-350-7239 INST INC., FAX: 619-571-0188; FSC No.: 34563; Empl.: 28; *Sls. Mgr.:* Ken Kalbfell

INSTRUMENTS & CONTROLS DIV., See Technology Systems Div., KRUG Intl.

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FAX: 516-467-8558

INSTRUMENTS FOR INDUSTRY, INC., 731 Union Parkway, Ronkonkoma, NY 11779, Tel: 516-467-8400, TWX: 510-222-0876; Empl.: 25 ..... **D•1014**

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AL Eva, Barr Elctrn. Instrs. 205-796-7533
AZ Mesa, DJM Elctrns. 602-820-4030
CA Valencia, DJM Elctrns. 805-254-2677
CO Englewood, R.A. Mayes Co. 303-761-9447
FL Orlando, Scientific Dvcs., S.E. 407-841-8180
GA Dunwoody, Scientific Dvcs., S.E. 404-392-1612
IA Hiawatha, EIR Co. 319-395-7514
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NH Hudson, EMC Sls., Inc. 603-889-5751
NJ N. Plainfield, Brady Co. 201-755-7900
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CA Torrance, O'Donnell Assocs. 213-539-9664
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ID Boise, Temco Northwest 208-345-2051
MN St. Paul, Arkco Sls. 612-777-7454
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WA Spokane, Temco Northwest 509-534-8635
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INSULCAST, Permagile Inds. Inc., 101 Commercial St., Plainview, NY 11803, Tel: 516-349-1100, TELEX: 221720 PERM UR, FAX: 516-349-1156; FSC No.: 13549; *Sls. Mgr.:* William P. Flaim, Natl. Sls. Mgr.

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Local Sales Offices & Reps

AZ Tempe, Elctrn. Dev./Sls. 602-438-1547
CA Arcadia, GM California 818-574-6960
CO Larkspur, GM Colorado 303-688-4154
FL Deerfield Beach, Jack Krutek & Assoc. 305-427-4202
HI Honolulu, Menehune Unlimited 808-737-3472
ID Eagle, GM/West 208-939-7202
IL Elgin, BK/Custom Engrd. Pts. 312-741-8556
IN Zionsville, WK/Custom Engrd. Pts. 317-873-5626
MI Southfield, E&A Inds., Inc. 313-647-0330
MN Burnsville, Electromec Sls., Inc. 612-894-8200
MO St. Louis, Halpin D. Burke & Son 314-968-2727
NH Mt. Vernon, GM/Northeast 603-673-9737
NJ Pitman, Colrud Corp. 609-589-5866
NJ West Caldwell, Grimm, Siegel & Assoc. 201-575-9300
NC Raleigh, Eastern Elctrns., Inc. 919-876-7591
OH Akron, Augnat Assocs. 216-239-2499
OR Eugene, Sls. GM Nameplate 503-726-1835
TX Irving, EDS Southwest 214-929-8140
VA Reston, Colrud Corp. 703-620-6612
WA Seattle, GM Nameplate Seattle 206-284-2200

INTEGRATED CIRCUITS INC. (ICI), See Interpoint

INTEGRATED COMPUTER SYSTEMS, 6053 W. Century Blvd., Los Angeles, CA 90045, Tel: 213-417-8888, TELEX: 4995168 ICS LA; Empl.: 100; *Sls. Mgr.:* John Valenti

INTEGRATED DEVICE TECHNOLOGY, INC., 3236 Scott Blvd., Santa Clara, CA 95054-3090, Tel: 408-727-6116, TWX: 910-338-2070; FSC No.: 61772; Empl.: 2000; *Sls. Mgr.:* Joe Zabkar (VP); *Dist. Mgr.:* Rick Keeling

INTEGRATED DIGITAL PRODUCTS, 1470 N. Hundley St., Anaheim, CA 92806, Tel: 714-666-1133, FAX: 714-666-8251; Empl.: 15; *Sls. Mgr.:* Jim Lewis; *Dist. Mgr.:* James Oetkin

INTEGRATED MICROWAVE, 3422 Tripp Ct, San Diego, CA 92121, Tel: 619-259-2600, TWX: 910-335-2037; FSC No.: 60656; Empl.: 75; *Sls. Mgr.:* Randy D. Mouber

INTEGRATED POWER DESIGNS, INC., 9c Princess Rd., Lawrenceville, NJ 08648, Tel: 609-896-2122, FAX: 609-895-1738; Empl.: 18; *Sls. Mgr.:* Steven Thompson ..... **D•1809**

Local Sales Offices & Reps

CA Mountain View, Swanson-Carleton 415-961-0565
MD Lisbon, S.K. MacDonald, Inc. 301-982-1088
MA Wakefield, Howard Jappe Co. 617-245-9359
NJ Flanders, K & R Engrg. Sls. 201-584-5235
PA Pipersville, Yax Assocs. 215-766-2100

INTEGRITY TECHNOLOGY, 105 Serra Way, Ste. 230, Milpitas, CA 95035, Tel: 408-262-8640, TELEX: 697-2396, ESYLNK: MCI Mail:209837, FAX: 408-262-1680; Empl.: 12; *Sls. Mgr.:* Larry Young

INTELCO, 8 Craig Road, Acton, MA 01720, Tel: 508-264-4485, TELEX: 62923380, FAX: 508-264-9677; Empl.: 35

IPM, INC., Elnik Systems, 3 Edison Place, Fairfield, NJ 07006, Tel: 201-882-8033, TELEX: 13-0567, FAX: 201-882-8037; Empl.: 8; *Sls. Mgr.:* Claus J. Joens

IRONICS INCORPORATED, 798 Cascadilla St., Ithaca, NY 14850, Tel: 607-277-4060, TELEX: 705-742; *Sls. Mgr.:* R. Chris Martens

IR SCIENTIFIC, Box 110, Carlisle, MA 01741, Tel: 508-667-7110; Empl.: 10

ISC CARDION ELECTRONICS, INC., Long Island Expwy., Woodbury, NY 11797, Tel: 516-921-7300, TELEX: 221683 CARD, TWX: 510-221-2179, FAX: 516-921-7330; FSC No.: 12909; Empl.: 450; *Sls. Mgr.:* F. J. Gareffa

ISC DATACOM, ISC Defense & Space, 1288 Reamwood Ave., Sunnyvale, CA 94089, Tel: 408-747-0300, FAX: 408-747-1873; FSC No.: 74444; Empl.: 35; *Sls. Mgr.:* C. Frank

ISC MAGNETICS DIV., See Aeroflex Labs., Inc., Magnetic Prods. Div.

Intelligence Power Technology

FAX: 805-987-0271

INTELLIGENCE POWER TECHNOLOGY, 829 Flynn Rd., Camarillo, CA 93010, Tel: 805-484-4441; Empl.: 35; *Sls. Mgr.:* Sharon Ellis ..... **D•1810**

Local Sales Offices & Reps

AL	Birmingham, FLW Southeast	205-822-0445
AL	Huntsville, FLW Southeast	205-536-6207
CA	Canoga Park, Dolphin Tech Entprs.	818-710-1966
CA	Los Altos, Frauman Assocs., Inc.	415-941-0660
CA	San Diego, Mesa Engrg.	619-278-8021
MA	Chelmsford, Encotronics	617-256-4207
FL	Orlando, FLW Southeast	407-894-1100
GA	Marietta, FLW Southeast	404-424-1731
KY	Ft. Mitchell, G. W. Thelen	606-341-8181
PA	Horsham, Jacobsen Assocs.	215-674-2937
NC	Charlotte, FLW Southeast	704-391-8812
OH	Medina, G. W. Thelen	216-723-1293
TX	Dallas, Hamilton Elctrns.	214-891-5459
WA	Bellevue, Underwood-Hanify	206-643-1793
WA	Vancouver, Underwood-Hanify	206-695-2311
WI	Greenfield, Olympic	414-281-9294

INTEPRO SYSTEMS INC., 450 Bedford St., Lexington, MA 02173, Tel: 617-863-9500; Empl.: 50; *Sls. Mgr.:* Mike O'Connor; *Dist. Mgr.:* Mike O'Connor

INTERACTION SYSTEMS INC., 130 Lincoln St., Brighton, MA 02135, Tel: 617-789-5900, FAX: 617-789-4979 ..... **D•1097**

INTERACTIVE COMPUTER PRODUCTS, INC., 23482 Peralta, unit C, Laguna Hills, CA 92653, Tel: 714-770-5332; Empl.: 20; *Sls. Mgr.:* Cheryl Patterson

INTERCONNECT DEVICES, INC., 5101 Richland Ave., Kansas City, KS 66106, Tel: 913-342-5544, TELEX: 286767 IDIKC UR, FAX: 913-342-7043; *Sls. Mgr.:* Lynda Kresin

Distributor

FAX: 714-447-3976

INTERCONNECT SPECIALTIES, INC., Tel: 800-752-4777, 714-773-0411, TELEX: 910 321 0310 ..... 613, 615, 640, 722, 725, 734, 789

INTERCONNECT TECHNOLOGIES, INC., 75 Heathridge Rd., Hamden, CT 19355, Tel: 203-288-8428, FAX: 203-288-6783; *Sls. Mgr.:* Jennifer Lavelle; *Dist. Mgr.:* Melinda Lavelle

INTERELECTRONICS CORP., Interelectronics Park, 550 U.S. Rte. 303, Congers, NY 10920, Tel: 914-EL8-8000; Empl.: 82; *Sls. Mgr.:* M. H. Pintell; *Dist. Mgr.:* G. Sherwood ..... **D•1811**

INTERFACE, INC., 7401 E. Butherus Dr., Scottsdale, AZ 85260, Tel: 602-948-5555, TELEX: 825-882, FAX: 602-948-1924; FSC No.: 32311

FAX: 617-986-8932

INTERFACE ENGINEERING INC., 300 Centre St., Unit 7, Holbrook, MA 02343, Tel: 617-986-2600, TELEX: 249-545; FSC No.: 14352; Empl.: 25; *Sls. Mgr.:* Thomas Scanlon ..... **D•1190-1191**

Local Sales Offices & Reps

NY	Great Neck, Industron Assoc.	516-487-2620

INTERFACE PRODUCTS, INC., 4630 North Ave., Oceanside, CA 92056, Tel: 619-945-0230, TELEX: 910-595-2564; FSC No.: 55300; Empl.: 100; *Sls. Mgr.:* Jim Iacono

INTERFACE TECHNOLOGY, Dynatech Corp., 2100 E. Alosta Ave., Glendora, CA 91740, Tel: 818-914-2741, TELEX: 4945489, FAX: 818-335-8346

INTERFAN
ONE OF THE PURDY GROUP OF COMPANIES

FAX: 415-340-1670

INTERFAN, William J. Purdy Co., 770 Airport Blvd., Burlingame, CA 94010, Tel: 415-347-1203; Empl.: 12; *Sls. Mgr.:* F. L. Nelson ..... **C•1670-1671**

Local Sales Offices & Reps

CA	Anaheim, Impact Elctrns., Inc.	714-533-1351,
CA	Burlingame, William J. Purdy Co.	415-347-7701
CA	San Diego, Pro Sls.	619-559-6033
CO	Englewood, William J. Purdy Co., Assocs.	303-790-2211,
FL	Maitland, Hutto Hawkins Assocs.	407-831-2474
FL	Pompano Bch., Hutto Hawkins Assocs.	305-979-0330,
FL	Tampa, Hutto Hawkins Assocs.	813-251-2970
GA	Atlanta, Millar Elctrns., Inc.	404-634-3350
IL	Elmhurst, F.F./Hill-Gray Assocs., Inc.	312-832-4101
IN	Indianapolis, John Sukup, Inc.	317-253-5501
MD	Monkton, Imagitron	301-374-5600
MI	Royal Oak, Hilltronics Inc.	313-435-0920
MN	Minneapolis, Components Grp.	612-374-1250
NH	Nashua, Bell Controls, Inc.	603-882-6984
NJ	Englewood, Sprung/Nussbaum, Inc.	201-569-5666
NM	Albuquerque, C.T. Carlberg	505-836-1448
NC	Raleigh, Millar Elctrns., Inc.	919-828-8840
OH	Cleveland, KT/DEPCO	216-442-6200
OH	Columbus, KT/DEPCO	614-447-0106
OR	Beaverton, Pacific Mktg. Specialists	503-641-9373
PA	Pittsburgh, KT/DEPCO	412-367-1011
TX	Dallas, Encore Technlg.	214-669-0232
TX	Round Rock, Encore Technlg.	512-388-7930
WA	Redmond, Pacific Mktg. Specialists	206-882-3144
Can	Lachine, Que., Bytewide Mktg.	514-636-4121,

INTER-MARKET, 1946 Lehigh Ave., Glenview, IL 60025, Tel: 312-729-5330, FAX: 312-729-4849; FSC No.: 34165; Empl.: 10; *Sls. Mgr.:* Phil Gardanier ..... **B•1178**

Local Sales Offices & Reps

MN	St. Paul, Kenco Tronics	612-645-7717
PA	Rydal, Espy Sls.	215-576-0780
WA	Redmond, Elctrn. Mktg.	206-882-0962
Can	Montreal, Que., Braydon Electro	514-332-5650

Local Distributors

CA	Chatsworth, Mil-Comm Distr.	818-998-3111
ID	Spirit Lake, A-1 Elctrns.	800-635-1545
IL	Chicago, Newark Elctrns.	312-638-4411
MN	St. Paul, K.D.I., Inc.	612-645-5090
NJ	Oakland, Relay Specialties	201-337-1000
Can	Montreal, Que., Braydon Electro	514-332-5650

INTERMATIC, Intermatic Plaza, Spring Grove, IL 60081, Tel: 815-675-2321, TELEX: 25-265, FAX: 815-675-2112; Empl.: 1000

INTER METRO INDUSTRIES CORP., North Washington St., Wilkes-Barre, PA 18705, Tel: 717-825-2741, TELEX: 831-833, FAX: 717-823-0250

INTERNATIONAL COMPONENTS CORP., 105 Maxess Rd., Melville, NY 11747, Tel: 516-293-1500, TELEX: 221576, FAX: 516-293-4983; Empl.: 100; *Sls. Mgr.:* Richard Weiner; *Dist. Mgr.:* Richard Weiner ..... **A•1082; D•1029-1031**

Local Sales Offices & Reps

AL	Huntsville, EMA	205-830-4030
AR	Little Rock, Erickson Sls.	501-455-0618
CA	Anaheim, Impact Elctrns.	714-533-1351
CA	Redwood City, Hickey Inds.	415-368-3849
CO	Colorado Springs, Romulus Elctrns.	719-574-8700
FL	Coral Springs, HAI, Inc.	305-752-7520
GA	Roswell, EMA, Inc.	404-992-7240
IL	Arlington Heights, MJ Petersen & Assoc.	312-577-8200
IA	Cedar Rapids, IOWA Tech. Sls.	319-393-8644
LA	Chalmette, Erickson Sls. Inc.	501-271-1976
MD	Spencerville, Espy Sls. Co.	301-384-3300
MA	Sudbury, KSA of New England	508-443-5881
MN	Minneapolis, Holmgren Assoc.	612-786-7641
NJ	Fort Lee, Neptune Elctrns.	201-461-2789
NY	Syracuse, Nycom	315-437-8343
NC	Raleigh, EMA, Inc.	919-846-6888
OH	Cincinnati, G & H Sls. Co.	513-272-0580
OH	Lakewood, G & H Sls. Co.	216-226-6800
OK	Broken Arrow, Erickson Sls. Inc.	918-455-4276
PA	Rydal, Espy Sls. Co.	215-576-0780
TX	Austin, Erickson Sls. Inc.	512-244-3068
TX	Dallas, Erickson Sls. Inc.	214-739-5833
TX	Houston, Erickson Sls. Inc.	713-266-1604
TX	Indianapolis, Mohrfield Mktg.	317-546-6969
PR	Hato Rey, Casanova Indl. Sls. Corp.	809-753-8674

Local Distributors

CA	Canoga Park, Myco Vickers	213-340-2025
CA	Redwood City, Hi-Cor	415-365-5087
CT	Bridgeport, Park Distr.	203-366-7200
CT	East Haven, JV Elctrns.	203-469-2321
FL	Ft. Lauderdale, Bros. Elctrns.	305-561-6700
FL	Ft. Lauderdale, National Resistor Co.	305-772-4500
IA	Cedar Rapids, Dee Elctrns.	319-365-7551
MA	Chelmsford, T.L.C. Comps.	508-250-9666
MN	Eden Prarie, Cassidy Elctrns.	612-944-0100
MN	Minneapolis, Cassidy Elctrns.	612-835-7746
MN	New Brighton, Chris Elctrns.	612-631-2647
NJ	Bellmaur, Mid-Atlantic Elctrns.	609-931-5303
NJ	Clifton, Vantage Comps.	201-667-1840
NJ	Rockaway, Tonar Inds.	201-586-9000
NY	Commack, Vantage Comps. Corp.	516-543-2000
PA	Philadelphia, Mur'Tronics	215-632-4330
TN	Hixson, Techni-Tronics	615-842-0514
TX	Ft. Worth, C & W Supp. Co.	817-831-0395
WA	Seattle, Vesco	206-575-3607

INTERNATIONAL CONFIGURATIONS, INC., P. O. Box 3374, Enfield, CT 06082, Tel: 203-749-6380, TELEX: 643 067, FAX: 203-244-1681; FSC No.: 62484; Empl.: 4; *Sls. Mgr.:* Mr. L. Baldwin

INTERNATIONAL CONTROLS & MEASUREMENTS CORP., P.O. Box 2819, Syracuse, NY 13220, Tel: 315-699-5266; FSC No.: 52516; Empl.: 50; *Sls. Mgr.:* Don Plath; *Dist. Mgr.:* Don Plath

INTERNATIONAL CONVERTER CORP., 770-101 Wooten Road, Colorado Springs, CO 80915, Tel: 719-570-6900, FAX: 719-570-6180; Empl.: 7 (U.S.), 1100 (Offshore); *Sls. Mgr.:* Deanna Thompson

INTERNATIONAL CRYSTAL MFG., 701 W. Sheridan, P.O. Box 26330, Oklahoma City, OK 73126, Tel: 405-236-3741, TELEX: 747-147, FAX: 405-235-1904; Empl.: 165; *Sls. Mgr.:* Paul E. Denwalt

INTERNATIONAL DATA TECHNOLOGY, INC., 7440 N.W. 13th St., Ft. Lauderdale, FL 33313, Tel: 305-587-6823, TWX: 910-997-4751 (DIGITAL); Empl.: 15

INTERNATIONAL DIGITAL ELECTRONICS, 160 W. Santa Clara St., Ste. 800, San Jose, CA 95113, Tel: 408-283-1010 (ext 107), FAX: 408-283-0344; Empl.: 2; *Sls. Mgr.:* Masanori Kotani

INTERNATIONAL DIODE, 229 Cleveland Ave., Harrison, NJ 07029, Tel: 201-482-6518; Empl.: 9; *Sls. Mgr.:* Lee Toong

INTERNATIONAL ELECTRO MAGNETICS, INC., 350 N. Eric Dr., Palatine, IL 60067, Tel: 312-358-4622, TELEX: 4932869 IEM UI; Empl.: 6; *Sls. Mgr.:* T. Pretto ..... **D•1032**

Local Distributors

NY	Morris, Boynton Studio	607-263-5695
NY	New York, United Research Labs.	212-751-4660

INTERNATIONAL INSTRUMENTATION, INC., 2282 Townsgate Rd., Westlake Vlg., CA 91361, Tel: 805-495-7673, FAX: 805-379-0701; Empl.: 32; *Dist. Mgr.:* Dan Kimberling

INTERNATIONAL INSTRUMENTS

FAX: 203-481-8937

INTERNATIONAL INSTRUMENTS:APRIME TECHNOLOGY COMPANY, Twin Lakes Rd, P.O. Box 185, N. Branford, CT 06471, Tel: 203-481-5721, TWX: 710-452-3092; Empl.: 150; *Dist. Mgr.:* Keith MacDowall ..... **D•1402-1403**

Local Sales Offices & Reps

KS	Olathe, Tech. Sls. Assoc.	913-829-2800
MD	Joppa, Electra-Tech	301-877-0344
MO	Ferguson, Tech. Sls. Assocs.	314-725-5361
NJ	Berkley Heights, NBS Assocs.	201-464-8500
NY	Rochester, H. C. Johnson Agys.	716-586-0777
OH	Westlake, Advanced Tech. Assocs.	216-835-5050
PA	Glenshaw, H. C. Johnson Agys.	412-487-1246
PA	Malvern, Stitzer Assocs.	215-644-5500
VA	Dumfries, Electra-Tech	703-670-6962

Local Distributors

CA	Los Angeles, E.I.L. Instrs., Inc.	213-685-7020
CA	Los Angeles, Metermaster	213-685-4340
CA	Palo Alto, Metermaster	415-960-8500
CA	San Diego, Metermaster	619-560-4844
CA	Santa Clara, Dynametron	408-727-6531
CA	Sunnyvale, E.I.L. Instrs.	408-245-4230
CO	Denver, E.I.L. Instrs., Inc.	303-534-4160
CO	Denver, Metermaster Instr. Corp.	303-722-5766
CT	Middletown, E.I.L. Instrs., Inc.	203-346-6646
FL	Palm Bay, E.I.L. Instrs., Inc.	305-725-8300
GA	Kennesaw, Metermaster	404-425-8902
IL	Bridgeview, E.I.L. Instrs., Inc.	312-430-2292
IL	Glendale Heights, Metermaster	312-250-0606
IN	Indianapolis, E.I.L. Instrs., Inc.	317-545-1373
KY	Louisville, E.I.L. Instrs., Inc.	502-454-3420
LA	New Orleans, Industrial Instr. Works	504-733-8355
MD	Gaithersburg, Pioneer Instrs. Div.	301-948-2242
MD	Sparks, E.I.L. Instrs.	301-771-4800
MA	Burlington, E.I.L. Instrs.	617-272-9450
MA	Southridge, CMI-Metermaster	617-765-0027
MI	Ferndale, Ram Meter Inc.	313-398-6767
MN	Minneapolis, Process Meas. Co.	612-544-4035
NJ	Pensauken, E.I.L. Instrs., Inc.	609-488-0474
NY	Clarence, E.I.L. Instrs.	716-634-8500
NY	Clarence, Trott Elctrns., Inc.	716-634-8800
NY	Hauppauge, E.I.L. Instrs., Inc.	516-231-6333
NY	Long Island City, Metermod Instr. Corp.	718-726-4850
NY	Pittsford, E.I.L. Instrs.	716-586-8251
NC	Charlotte, E.I.L. Instrs.	704-376-2237
OH	Cleveland, Metermaster	216-651-4100
OH	Cleveland, Pioneer/Instrmn. Div.	216-587-3600
OH	Dayton, E.I.L. Instrs., Inc.	513-435-2134
OH	Willoughby, E.I.L. Instrs.	216-953-0222
OR	Beaverton, Eicher-Richards	503-641-3300
PA	Philadelphia, Sunshine Scientific	215-673-5600
PA	Pittsburgh, CAM/RPC Instrmn.	412-963-1885
PA	Pittsburgh, E.I.L. Instrs.	412-823-2255
TX	Dallas, E.I.L. Instrs., Inc.	214-931-1236
TX	Garland, Metermaster	214-271-5671
TX	Houston, E.I.L. Instrs., Inc.	713-271-3100
TX	Houston, Meters & Instr. Corp.	713-644-1631
VA	Norfolk, E.I.L. Instrs., Inc.	804-855-9553
VA	Springfield, E.I.L. Instrs., Inc.	703-569-2611
WA	Redmond, E.I.L. Instrs., Inc.	206-882-3222
WA	Seattle, Eicher Richards	206-527-8275
Can	Alberta, Calgary, E.I.L. Instrs.-Multi Source	403-271-2001
Can	Deseronto, Ont., E.I.L. Instrs.	613-396-3383
Can	Longueuil, Que., E.I.L. Instrs.	514-651-4844
Can	Mississauga, Toronto, E.I.L. Instrs.	416-624-6660
Can	Toronto, Ont., Versatile Measuring Instrs.	416-238-8161
AZ	Tempe, Metermaster	602-437-1425

INTERNATIONAL LIGHT, 17 Graf Rd., Newburyport, MA 01950-4092, Tel: 508-465-5923, TELEX: 94-7135, FAX: 508-462-0759; Empl.: 19; *Sls. Mgr.:* Jack Kelley; *Dist. Mgr.:* Jack Kelley

INTERNATIONAL MACHINE & TOOL CORP., 115 Maple St., Warwick, RI 02888, Tel: 401-467-6905, TWX: 510-100-4251, FAX: 401-467-5885; Empl.: 35; *Sls. Mgr.:* Peter S. Piscopio

IMS

FAX: 401-683-5571

INTERNATIONAL MANUFACTURING SERVICES, 50 Schoolhouse La., Portsmouth, RI 02871-2418, Tel: 401-683-9700; FSC No.: 4S177; Empl.: 25; *Sls. Mgr.:* Jay Benson ..... **A•1953**

Local Sales Offices & Reps

MA	Attleboro, Antex-Overseas Sls.	617-222-5221
NJ	Flanders, K & R Engr. Sls.	800-452-9767

INTERNATIONAL MICROELECTRONIC PRODS., 2830 North First Street, San Jose, CA 95134, Tel: 408-432-9100, TELEX: 499-1041, TWX: 910-338-2274; Empl.: 380; *Sls. Mgr.:* Robert Krofner

INTERNATIONAL MIRCOELECTRONICS, P.O. Box 170415, Arlington, TX 76003, Tel: 817-561-2244, FAX: 817-483-8157; *Sls. Mgr.:* Wayne Fleming

INTERNATIONAL MICROSYSTEMS, 461 Valley Way, Milpitas, CA 95035, Tel: 800-237-4734; Empl.: 10; *Sls. Mgr.:* Peter Schade

INTERNATIONAL POLARIZER, INC., 320 Elm Street, Marlborough, MA 01752, Tel: 508-481-7495, TELEX: 601 6454, FAX: 508-481-0222; Empl.: 7; *Sls. Mgr.:* Donald Rickert

INTERNATIONAL POWER
DC POWER SUPPLIES

FAX: 805-388-2686

INTERNATIONAL POWER D.C., Power Supplies Inc., 355 N. Lantana, Ste. 710, Camarillo, CA 93010, Tel: 805-987-7900, TWX: 510-600-6944, ESYLNK: 62911592; Empl.: 25; *Sls. Mgr.:* Craig Johnson; *Dist. Mgr.:* Ron Ostlund ..... **D•1812-1814**

Local Sales Offices & Reps

AZ	Phoenix, S.W. Tech. Sls.	602-893-1209
CA	El Cajon, Atronix	619-444-1501
CA	Oceanside, Atronix	619-438-2537
CA	San Jose, Nelson Elctrn. Sls.	408-293-2600
CA	Woodland Hills, Atronix	818-703-7212
CT	Bethel, Livera Polk Assocs.	203-748-4639
FL	Land O Lakes, A.J. Power Source	813-996-2583
IL	Wheeling, Ed Joyner & Co.	312-520-1200
IN	Indianapolis, JFCO, Inc.	317-576-9363
MD	Randallstown, Beacon North, Inc.	703-478-2480
MI	Grand Rapids, JFCO, Inc.	616-245-4621
MI	Lake Orion, JFCO, Inc.	313-693-2053
MN	Richfield, Clay Rep Co.	612-861-2191
NH	Londonderry, Bennetron	603-432-9092
NJ	Madison, Livera-Polk Assocs.	201-377-3220
NY	Glen Head, Livera-Polk Assocs.	516-759-9300
OH	Cleveland, JFCO, Inc.	216-398-6300
OH	Vandalia, JFCO, Inc.	513-890-8322
OR	Hillsboro, Turn-A-Round Sls.	503-640-4641
PA	Pittsburgh, JFCO, Inc.	412-823-5400
TX	Austin, Barry Sls., Inc.	512-837-3616
TX	Houston, Barry Sls., Inc.	713-784-5860
TX	Richardson, Barry Sls., Inc.	214-234-0255
UT	Ogden, Taylor Mktg.	801-546-9570
VA	Sterling, Beacon North, Inc.	703-478-2480
WI	Milwaukee, Ed Joyner & Co.	414-481-0547
Can	St. Laurent, Que., Componetics, Ltd.	514-334-1464
Can	Surrey, B.C., Enerlec Sls., Ltd.	604-888-1667

Local Distributors

CA	Canoga Pk., Sandy's Elctrn. Supp.	818-346-8353
CA	N. Hollywood, Sandy's Elctrn. Supp.	818-765-8585, 818-983-2550
CA	Thousand Oaks, Pace Elctrns.	818-889-1209, 805-497-7515
IL	Champaign, Klaus Radio	217-356-1896
IL	Mt. Prospect, Feed Control	312-253-3898
IL	Villa Pk., Melvin Elctrns.	312-279-5015
IN	Carmel, Altex Elctrns.	317-848-1323
MD	Evansville, Evansville Supp. Co.	812-424-7541
MD	Gaithersburg, Axis Elctrns.	301-840-9640
MD	Glen Burnie, Baytronics	301-766-0081, 301-953-7050
MA	Norwood, Emtel Elctrns.	617-769-9500
MN	Maplewood, Edison Controls	612-770-5122
NH	Londonderry, Orion Inds., Inc.	603-437-4446
NY	Glen Head, Livera Polk Assocs.	516-759-9300
NC	Raleigh, Sager/Svc. Plus Elctrns.	919-850-9550
OH	Highland Heights, Major Electronix	216-461-2100
PA	McKean, Advacom, Inc.	814-476-7774
TX	Richardson, All-Power	214-234-0255
VA	Sterling, ICE Comps., Inc.	703-478-2677
WI	Cedarburg, A-A Elec.	414-377-7500
Can	St. Laurent, Que., Componetics, Ltd.	514-334-1460
Can	Surrey, B.C., Enerlec Sls.	604-888-1667

INTERNATIONAL POWER DEVICES INC., 155 N. Beacon St., Brighton, MA 02135, Tel: 617-782-3331, ESYLNK: 989-752, FAX: 617-782-7416; Empl.: 96; *Sls. Mgr.:* Aileen Liu, G/M ..... **D•1815-1816, 1818-1822**

Local Sales Offices & Reps

AL	Huntsville, Macro Mktg.	205-883-9630
AZ	Mesa, Elec-Com Assocs.	602-844-0566
CA	Del Mar, Power Partners	619-481-0422
CA	Los Angeles, Power Partners	213-215-0800
CA	San Diego, Power Partners	800-468-5400
CA	San Ramon, Tech. Consits.	415-830-0829
CO	Littleton, MRC	303-794-4644
FL	Land O'Lakes, A.J.'s Power Source	813-996-2583
GA	Norcross, Macro Mktg.	404-662-5580,404-441-1081
IL	Skokie, Electro-Tech Mktg. Assocs., Inc.	312-676-3151
IA	Cedar Rapids, Lorenz Sls.	319-377-4666
KS	Merriam, Lorenz Sls.	316-721-0500
MA	Brighton, IPD	617-782-3331
MA	Waltham, Newport Tech. Sls.	617-890-7255
MI	Ann Arbor, Augnat Assocs.	313-668-3134
MN	Bloomington, Smiley/Scott Inc.	612-888-5551
MO	St. Louis, Rush & West Assocs., Inc.	314-965-3322
NE	Lincoln, Lorenz Sls.	402-475-4660
NH	Londonderry, Bennetron	603-432-9092
NJ	Haddonfield, Sunday O'Brien	609-429-4013
NY	Buffalo, Ed Westgren Assocs.	716-632-0011
NY	Rochester, Ed Westgren Assocs.	716-426-3598
NC	Raleigh, Micro Sls., Inc.	919-881-0007
OH	Akron, Augnat Assocs.	216-273-1211
OH	Dayton, Augnat Assocs.	513-298-1507
OH	Kettering, Electro-Com	513-299-0864
OR	Portland, Power Sources Unltd.	503-292-0820
OR	Portland, Power Sources, Unltd.	503-292-0820
TX	Dallas, Seaton Corp.	214-980-9860
TX	Houston, Seaton Corp.	713-731-2649
VA	Richmond, Glasscock Assocs.	804-740-0063
WA	Redmond, Elctrns. N.W. Inc.	206-883-1959
WI	Brookfield, Electro-Tech Mktg., Inc.	414-785-9554

Local Distributors

GA	Norcross, Applied Power, Inc.	404-263-0421, 1-800-445-8415
MI	Brighton, Applied Power, Inc.	313-227-3604, 1-800-624-5496
NH	Londonderry, Orion Inds.	603-437-3260

INTERNATIONAL POWER MACHINES, 2975 Miller Park North, Garland, TX 75042, Tel: 800-527-1208, TELEX: 794078 IPM POWER, FAX: 214-494-2690; *Sls. Mgr.:* Wayne Harper

International Power Sources, Inc.

FAX: 508-879-8669

INTERNATIONAL POWER SOURCES, INC., 200 Butterfield Dr., Ashland, MA 01721, Tel: 508-881-7434, TWX: 510-881-7434 ..... **D•1824-1826**

Local Sales Offices & Reps

AL	Huntsville, Over & Over, Inc.	205-837-7105
AZ	Scottsdale, Power Up Elctrns.	602-955-1105
CA	Laguna Hills, Electro Venture South	714-581-9244
CA	Los Altos Hills, H B Mktg.	415-941-4080
FL	Tampa, Over & Over, Inc.	813-626-9100
GA	Norcross, Over & Over, Inc.	404-449-6205
IL	Arlington Hgts., Phoenix Elctrn. Sls.	312-394-4422
IA	Des Moines, The Beams Co.	515-255-1148
KS	Shawnee Mission, The Beams Co.	913-631-0300
MA	Franklin, OEM Mktg. & Sls.	508-528-4983
MA	Hunt Valley, Eagle Sls. Corp.	301-666-3930
MN	Edina, Engineering Prods. Assoc., Inc.	612-835-9022
MO	St. Louis, The Beams Co.	314-434-8448
NH	Salem, OEM Mktg. & Sls.	603-893-0009
NY	Jericho, J-Square Mktg.	516-935-3200
NC	Charlotte, Over & Over, Inc.	704-542-9110
OH	Cincinnati, KCH Co.	513-931-1686
PA	Montgomeryville, Eastern Sci. Mktg.	215-368-4570
TX	Richardson, Jim D. Gray & Assocs.	214-699-9976
UT	Ogden, Taylor Mktg.	801-545-9570

Local Distributors

CA	Redwood City, HdB Elctrns.	415-368-1388
GA	Norcross, Applied Power, Inc.	404-263-0421
MI	Brighton, Applied Power, Inc.	313-229-6550
NH	Londonderry, Orion Inds., Inc.	603-437-4446
TX	Stafford, Southwest Elctrns.	713-240-4000

International IOR Rectifier

FAX: 213-772-9028

INTERNATIONAL RECTIFIER CORP., Semiconductor Div., 233 Kansas St., El Segundo, CA 90245, Tel: 213-772-2000, TELEX: 472-0403, TWX: 910-348-6291; Empl.: 1900; *Sls. Mgr.:* Don Prescott; *Dist. Mgr.:* Shawn Fogarty ..... **B•1543**

Local Sales Offices & Reps

AL Huntsville, Montgomery Mktg., Inc. 205-830-0498
AZ Phoenix, Sun State Tech. Sls. 602-220-0595
CA Chatsworth, First Rep 818-718-6155
CA Mtn. View, Brooks Tech. Grp. 415-960-3880
CA San Diego, Harvey King, Inc. 619-587-9300
CA Tarzana, Power Comp. Sls. 818-881-9111
CO Wheat Ridge, Waugaman Assocs., Inc. 303-423-1020
CT Fairfield, N.R.G. Ltd., Inc. 203-384-1112
FL Boca Raton, Lawrence Assocs., Inc. 305-368-7373
GA Norcross, Montgomery Mktg., Inc. 404-447-6124
IL Hoffman Estates, Micro-Tex, Inc. 312-382-3001
IL Palatine, International Rectifier 312-397-0002
KY Carmel, Tech. Mktg. Corp. 317-844-8462
IA Cedar Rapids, Hitec Cen., Inc. 319-396-3228
KY Louisville, Technlg. Mktg. Corp. 502-893-1377
MD Columbia, L. D. Lowery, Inc. 301-381-0225
MA Burlington, AD/Nova Sls., Inc. 617-270-9600
MI Farmington Hills, Luebbe Sls. 313-489-8828
MN Edina, Mel Foster Tech. Sls. 612-941-9790
MO Florissant, Hitec Control, Inc. 314-831-9377
NJ Pallisades Park, International Rectifier 201-943-4554
NJ W. Caldwell, Tech. Mktg. Grp. 201-226-3300
NM Albuquerque, Reptronix Ltd. 505-292-1718
NY E. Syracuse, Nycom, Inc. 315-437-8343
NY Melville, Tech. Mktg. Grp. 516-351-8833
NY Poughkeepsie, Intl. Rectifier 914-471-5300
NC Cary, Montgomery Mktg., Inc. 919-467-6319
NC Greensboro, Intl. Rectifier 412-837-9155
NC Raleigh, Montgomery Mktg., Inc. 919-851-0010
OH Cincinnati, Luebbe Sls. Co. 513-530-0600
OH Cleveland, Luebbe Sls. Co. 216-333-0425
OH Columbus, Luebbe Sls. Co. 614-431-0474
OH Dayton, Luebbe Sls. Co. 513-294-0426
OH Northfield, Intl. Rectifier 216-467-0852
OK Tulsa, BP Sls. 918-744-9964
OR Portland, N.W. Mktg. Assocs. 503-620-0441
PA Broomal, L. D. Lowery, Inc. 215-356-5300
PA Greensburg, Intl. Rectifier 412-837-9155
PA Pittsburgh, Luebbe Sls. Co. 412-364-0490
TX Austin, BP Sls. 512-346-9186
TX Houston, BP Sls. 713-782-4144
TX Richardson, BP Sls. 214-234-8438
UT Salt Lake City, R-Squared Mktg. 801-595-0631
WA Bellevue, N.W. Mktg. Assocs. 206-455-5846
WI Elm Grove, International Rectifier 414-784-2480
WI Waukesha, Micro-Tex, Inc. 414-542-5352

IRC
A Member of the Crystalate Group

FAX: 704-264-8865

INTERNATIONAL RESISTIVE COMPANY, P.O. Box 1860, Boone, NC 28607, Tel: 704-264-8861, TELEX: 46-9902; Empl.: 1700; *Sls. Mgr.:* Larry J. Johnston; *Dist. Mgr.:* Hugh Bolen ..... **A•1746-1747, 1954-1961, 2110-2111; B•1015-1017, 1897**

Local Sales Offices & Reps

AL Huntsville, R. O. Whitesell & Assocs. .. 205-883-5110
AZ Scottsdale, SW Sls. Inc. 602-991-1937
CA Montrose, Luscombe Engrg. Co. 818-249-9000
CA Sacramento, ETS 916-962-3030
CA San Jose, ETS 408-433-9366
CO Westminster, Straube Assocs. 303-426-0890
CT North Haven, Coakley, Boyd & Abbett, Inc. 203-239-6217
FL Tampa, APM Assocs. 813-886-2457
GA Norcross, S. Atlantic Comp. Sls. 404-447-6154
IL Itasca, Circuit Sls. Inc. 312-833-2242
IN Ft. Wayne, R. O. Whitesell & Assocs. .. 219-432-5591
IN Indianapolis, R. O. Whitesell & Assocs. 317-359-9283
IA Cedar Rapids, C. H. Horn & Assocs. .. 319-393-8703
KS Lenexa, Midtec Assocs. 913-541-0505
KY Pewee Valley, R. O. Whitesell & Assocs. 502-241-1441
MD Columbia, L. D. Lowery Inc. 301-381-0225
MA Needham Hgts., Coakey, Boyd, & Abbett 617-444-5470
MI Grand Blanc, R. O. Whitesell & Assocs. 313-695-0770
MI Grand Rapids, R. O. Whitesell & Assocs. 616-942-5420
MI Southfield, R. O. Whitesell & Assocs. .. 313-559-5454
MI St. Joseph, R. O. Whitesell & Assocs. 616-983-7337
MN Minneapolis, Tecteam Sls., Inc. 612-854-6616
MO St. Louis, Jack Macke Co. 314-432-2830
NJ Hackensack, Coakley, Boyd Abbett, Tylinski, Inc. 201-440-4114
NY Rochester, Electra Sls. 716-427-7860
NY Syracuse, Electra Sls. 315-463-1248
NC Raleigh, S. Atlantic Comp. Sls. 919-859-9970
OH Cincinnati, R. O. Whitesell & Assocs. .. 513-521-2290
OH Cleveland, R. O. Whitesell & Assocs. .. 216-447-9020
OH Columbus, R. O. Whitesell & Assocs. 614-888-9396
OH Dayton, R. O. Whitesell & Assocs. 513-298-9546
OK Tulsa, Ion Assocs. 918-481-2199
PA Broomall, L. D. Lowery Inc. 215-356-5300
PA Pittsburgh, R. O. Whitesell & Assocs. 412-963-6161
TN Knoxville, R. O. Whitesell & Assocs. ... 615-694-9476
TN Nashville, R. O. Whitesell & Assocs. ... 615-352-4760
TX Austin, Ion Assocs. 512-331-7251
TX El Paso, S. W. Sales 915-594-8259
TX Grand Prairie, Ion Assocs. 214-647-8225
TX Houston, Ion Assocs. 713-537-7717
UT Salt Lake City, Straube Assocs. 801-263-2640
VA Earlysville, L. D. Lowery Inc. 804-973-6672
OR Lake Oswego, RTS 503-244-4123
WA Vashon, RTS 206-285-1363
WI Brookfield, Circuit Sls., Inc. 414-784-7773
Can Montreal, Que., Tech-Rep 514-337-6046

Local Distributors

CA Campton, Harper S.I.D. 213-979-5090
CA Gardena, Bell Inds. 213-515-1800
CA Sunnyvale, Bell Inds. 408-734-8570
CA Sunnyvlae, Harper S.I.D. 408-988-6041
FL Tampa, Impala Elctrns. 813-885-4747
IL Schaumburg, Arrow Elctrns. 312-397-3440
IN Indianapolis, Graham Elctrns. 317-634-8202
IA Cedar Rapids, Deeco 319-365-7551
MA Woburn, Jaco Elctrns. 617-933-7760
MN Edina, Arrow Elctrns. 612-830-1800
NJ Hanover, State Elctrns. 201-887-2550
NJ Marlton, Arrow Elctrns. 609-596-8000
NY Hauppauge, Jaco Elctrns. 516-273-5500
NC Raleigh, Arrow Elctrns. 919-876-3132
NC Raleigh, Resco/Raleigh 919-781-5700
OH Columbus, Electronic Mktg. 614-299-4161
PA Philadelphia, Philadelphia Elctrns. 215-568-7400
TX El Paso, Intl. Elctrns. 915-778-9761
TX Richardson, Jaco Elctrns. 214-235-9575
WA Bellevue, Priebe Elctrns. 206-821-4695

INTERNATIONAL RESOURCE SVCS., 7792 N.W. 72nd Ave., Miami, FL 33166, Tel: 305-884-2924, TELEX: 529076 SUN MIA UD, FAX: 305-884-3771; Empl.: 5; *Sls. Mgr.:* Richard L. Winn

FAX: 402-694-6180

INTERNATIONAL SENSOR SYSTEMS, INC., Aurora Industrial Pk., Box 345, Aurora, NE 68818, Tel: 402-694-6111; Empl.: 45; *Sls. Mgr.:* Wayne Roblee ..... **A•1748-1749**

Local Sales Offices & Reps

CA Milpitas, Custom Technlg. Sls. 408-263-3660
CA Mission Viejo, EAB Assocs. Inc 714-859-7701
MD Baldwin, Quarterback Sls. Inc. 301-764-9400
MO Jefferson City, Williams Assocs. Co. .. 314-893-2459
NE Omaha, IONEB 402-895-4431
NY Liverpool, Syronics, Inc. 315-451-0968
OH Cincinnati, Applied Data Mgt. 513-579-8108
PA Southampton, Campbell Assocs. 215-322-6630
TN McMinnville, B & D Mktg. 615-473-7155
TX El Paso, Nokomis of El Paso, Inc. 915-778-2801
TX Lewisville, Elctrn. Prod. Reps. 214-436-4772

INTERNATIONAL TELECOMMUNICATIONS COMPONENTS, INC., 94 B East Jefryn Blvd., Deer Park, NY 11729, Tel: 516-243-1444, FAX: 516-595-9160; FSC No.: 0E6J8; Empl.: 15; *Sls. Mgr.:* Rick Walter

INTERNATIONAL TRANSDUCER CORP., Channel Technologies, Inc., 869 Ward Dr., Santa Barbara, CA 93111, Tel: 805-683-2575, TELEX: 658 495; FSC No.: ID 532; Empl.: 65; *Sls. Mgr.:* Christine M. Bashforth

INTERNATIONAL WIRE PRODUCTS CO., 500 W. Main St., Wyckoff, NJ 07481, Tel: 201-891-5800, TELEX: 642580; Empl.: 700; *Sls. Mgr.:* C. D. Abbott

INTEROPTICS

FAX: 415-340-1670

INTEROPTICS, Purdy Group, 770 Airport Blvd., Burlingame, CA 94010, Tel: 415-347-7727, TELEX: 677-1439 (PURDY UW); Empl.: 35 ..... **B•1214**

Local Sales Offices & Reps

AZ Phoenix, C.T. Carlberg & Assocs. 602-468-0750
CA Anaheim, Exsell Sls. Assocs. 714-978-5740
CA Burlingame, William J. Purdy Co. 415-347-7701
CA Poway, Exsell Sls. Assocs. 714-978-5740
CA San Jose, Exsell Sls. Assocs. 800-873-1873
FL Boca Raton, Beacon Elctrns. 407-997-5740
FL Clearwater, Beacon Elctrns 813-796-2378
FL Longwood, Beacon Elctrns. 407-332-1940
MN Bloomington, Heil's Termatech Elctrn. Mktg. 612-854-2001
NH Nashua, Bell Controls, Inc. 603-882-6984
NJ Passaic, Lightcomm Sls. Assocs. 201-778-6540
NM Albuquerque, C.T.Carlberg & Assocs. . 505-836-1448
NY New York, Lightcomm Sls. Assocs. ... 212-807-8924
NY Utica, Fiber Instrs. Sls. 315-735-1691
NC Fayetteville, Zim-Tek 919-488-4101
OK Tulsa, Beacon Elctrns. 918-622-1494
OR Beaverton, Pacific Mktg. Specialists ... 503-641-9373
TX Austin, Beacon Elctrns. 512-345-3543
TX Dallas, Beacon Elctrns. 214-437-1505
VA Richmond, EME IV, Inc. 804-360-5-49
VA Williamsburg, EME IV, Inc. 804-253-0171
WA Redmond, Pacific Mktg. Specialists ... 206-882-3144

Local Distributors

CA Anaheim, Fibertron 714-634-3449
Can Burnaby, BC, C.D. Nova, Ltd. 604-430-5612

interpoint

INTERPOINT CORPORATION, 10301 Willows Roads, P.O. Box 97005, Redmond, WA 98073-9705, Tel: 206-882-3100, FAX: 206-882-1990; FSC No.: 50821; Empl.: 300; *Sls. Mgr.:* D. T. Baughman ..... **A•1750-1751; D•1828-1835**

Local Sales Offices & Reps

AL Huntsville, Novus Grp. 205-534-0044
AZ Tempe, Gassner & Clark 602-968-9037
CA Costa Mesa, Interpoint 714-432-6472
TX Irving, Kite Elctrn. Sls. 214-674-1330
CA San Diego, Martronix 619-728-0384
CO Parker, Tech. Mktg. Assocs. 303-841-3435
FL Deerfield Bch., Krutek & Assocs. 305-427-4202
GA Lilburn, Novus Grp. 404-381-1015
IA Des Moines, Beams Co. 515-255-1148
KS Shawnee Mission, Beams Co. 913-631-0300
MD Owings Mills, Neal Deoul Assocs. 301-363-4311
MA Wakefield, Howard C. Jappe Co. 617-245-9359
MN Minneapolis, Interpoint 612-921-8443
MO St. Louis, Beams Co. 314-934-8448
MO St. Louis, Beams Co. 314-569-1060
NJ Flanders, K & R Engrg. Sls. 201-584-5235
NY N. Syracuse, Advanced Comps. Corp. . 315-699-2671
NC Raleigh, Novus Grp. 919-872-3966
OH Cleveland, Arthur H. Baier Co. 216-461-6161
PA Newtown, Yax Assocs. 215-860-2540
TX Irving, Kite Electrn. Sls. 416-674-1330
Can Ontario/Scarborough, Bestec Elctrns., Ltd. 416-674-1330

INTERSIL, 2450 Walsh Ave., Santa Clara, CA 95051, Tel: 408-996-5000, TWX: 910-338-0583; FSC No.: 32293; Empl.: 4102; *Dist. Mgr.:* Bruce Mattern

INTERSTATE ELECTRONICS CORP., Box 3117, 1001 E. Ball Rd., Anaheim, CA 92803, Tel: 714-758-0500, TELEX: 655443, TWX: 910-591-1197; FSC No.: 6625, 5985; Empl.: 1500; *Sls. Mgr.:* Darryl Watanabe; *Dist. Mgr.:* R. Sorenson

INTERSTATE WIRE CO., INC., 10820 Sanden Dr., Dallas, TX 75238, Tel: 214-553-1311, TWX: 910-860-5084, FAX: 214-348-7106; *Sls. Mgr.:* Chris B. Brandon

INTERSWITCH, Wm. J. Purdy Co., 770 Airport Blvd., Burlingame, CA 94010, Tel: 415-347-8217, TELEX: 677-1439, FAX: 415-340-1670; FSC No.: (Purdy UW); Empl.: 30; *Sls. Mgr.:* Clarence Bruce ..... **B•1867**

Local Sales Offices & Reps

CA Burlingame, Interswitch 415-347-8217
AZ Phoenix, C.T. Carlberg & Assoc. 602-468-0750
CA Anaheim, Impact 714-533-1351

CA Burlingame, William J. Purdy Co. 415-347-7701
CO Denver, William J. Purdy Co. 303-790-2211
CT Meriden, Advanced Comp. Sls. 203-238-6891
IL Ambler, W.R.Hartmaier Assocs. 215-643-6691
IL Elmhurst, F.F./Hill-Gray 312-832-4101
IN Indianapolis, John Sukup Inc. 317-253-5501
MD Lisbon, S. K. MacDonald 301-982-1088
MA Framingham, Gallagher Assocs., Inc. .. 508-626-2346
MI Royal Oak, Hilltronics, Inc. 313-435-0920
MA Farmingham, Gallagher 617-626-2346
NM Albuquerque, C.T. Carlberg & Assocs. 505-836-1448
NM Albuquerque, William J. Purdy Co. 505-266-7959
NY Fairport, Net Sls., Inc. 716-223-1030
NY Rochester, Net Sls. 716-223-1030
OH Cleveland, Marlow 216-991-6500
OH Dayton, Marlow 513-274-9666
OR Beaverton, Pacific Mktg. 503-641-9373
PA Philadelphia, S. K. MacDonald, Inc. 215-545-1205
TX Dallas, Elcom Mktg. 214-241-2166
TX Houston, Elcom Mktg. 713-350-8064
TX Irving, EDC 214-257-0322
WA Redmond, Pacific Mktg. 206-882-3144
Can Oakville, Ont., Haltronics, Ltd. 416-844-2121

Local Distributors

AL Huntsville, Powell Elctrns. 205-539-2731
AZ Tempe, Anjon Entprs. 602-894-1332
AZ Tempe, Waltronic Sls. 602-967-1020
CA Burbank, Merit Comp. Supp. 818-842-8162
CA Canoga Pk., Panel Parts Co. 818-884-8898
CA Costa Mesa, Powell 714-754-1717
CA Fremont, Allied Elctrns. 415-770-0590
CA San Jose, Powell 408-943-9020
CA Santa Clara, Waltronic Sls. 408-727-1200
CA Sunnyvale, Penstock 408-730-0300
CO Denver, Integrated Elctrns. 303-292-5537
FL Ft. Lauderdale, Powell 305-484-8377
GA Norcross, Allied Elctrns. 404-446-8595
IL Chicago, Federal Screw Prods. 312-478-5744
IL Elgin, Allied Elctrns. 312-697-8200
MD Columbia, Powell 301-621-8080
MD Columbia, Powell Elctrns., Inc. 301-621-8080
MA Lynn, Land Elctrn. Co. 617-592-2220
MA Westborough, Powell Elctrns. 617-366-6100
MA Wilmington, Allied Elctrns. 617-942-0150
MN Minneapolis, Bergquist 612-835-2322
NJ Englewood, Powell Elctrns. 201-894-0800
NJ Mt. Laurel, Allied Elctrns. 609-234-7769
NM Albuquerque, Walker Elctrn. Supp. 505-883-2992
NY Buffalo, Summit Distrs. 716-884-3450
NY Mt. Vernon, QAR Indl. Elctrns. 914-699-2224
NY Rochester, Allied Elctrns. 716-244-9440
NY Rochester, Summit Elctrns. 716-334-8110
NC Raleigh, Allied Elctrns. 919-876-5845
NC Winston-Salem, Kirkman Elctrns. 919-722-9131
PA Philadelphia, Powell 215-365-1900
PA Philadelphia, Resco Elctrns. 215-659-4575
PA Pittsburgh, Allied Elctrns. 412-367-4124
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Irving, Powell 214-550-0547
UT Salt Lake City, Standard Supp. Co. 801-486-3371
WA Seattle, Allied Elctrns. 206-547-2827
WI Mequon, Taylor Elec. Co. 414-241-4321
Can Don Mills, Ont., Saynor Varah 416-445-0723
Can Oakville, Ont., Paltronics, Ltd. 416-844-2121
Can Willowdale, Ont., Electrosonic 416-494-1666

INTER-TECHNICAL GROUP INC., WIMA Div., 2269 Saw Mill River Rd., Ste. 400, Elmsford, NY 10523, Tel: 914-591-8822, TWX: 710-564-0802, FAX: 914-591-7336; Empl.: 17; *Sls. Mgr.:* Gary M. Fey; *Dist. Mgr.:* Andrew E. Dvorscak ..... **A•1083**

Local Sales Offices & Reps

AL Huntsville, J. R. Assocs. 205-830-2130
CA Campbell, Shur Sls. 408-374-5577
CO Arvada, ArrowHead/CSI Sls. Corp. 303-423-5556
FL Altamonte Springs, 'C' Assocs., Inc. ... 305-831-1717
GA Conyers, J.R. Assocs. 404-760-1815
IL Westchester, W. G. Brouilette & Assocs. 312-345-6500
MA Newton, Normell Assocs. 617-969-5478
MN Minneapolis, Holmgren Assocs. 612-786-7641
NJ Upper Montclair, McCarron Entprs., Inc. 201-783-3112
NY Rochester, BKT Assocs., Inc. 716-461-9880
NY Smithtown, T & K Sls. 516-724-3456
OR Beaverton, Harry Levinson Co. 503-690-1312
PA Ambler, W M Assocs. 215-643-4119
TN Chattanooga, J. R. Assocs. 615-977-0711
TX Houston, Barry Sls., Inc. 713-784-5860
TX Richardson, Barry Sls, Inc. 214-234-0255
UT West Valley, Butterworth Mktg. 801-972-5566
VA Richmond, Glasscock Assocs. 804-740-0063
WA Seattle, Harry Levinson Co. 206-382-1300

Local Distributors

CA San Jose, Shelly-Ragon, Inc. 408-432-0600
CA Sunnyvale, Capsco Sls., Inc. 408-734-3020
GA Norcross, Spectrum Elctrns., Inc. 404-448-1516
IL Rosemont, Advent Elctrns., Inc. 312-297-6200
IN Indianapolis, Advent Elctrns., Inc. 317-872-4910
IA Cedar Rapids, Advent Elctrns., Inc. 319-363-0221
MA Ashland, March Elctrns. 508-881-6715
MN New Brighton, Chris Elctrns. Distr. 612-631-2647
NY Bohemia, March Elctrns. 516-563-6000
OH Englewood, Argent Inds., Inc. 513-836-8633
PA Exton, VSH Elctrns. 215-363-2250
PA North Versailles, CMD Elctrns., Inc. 412-678-6020
TX McKinney, Prime Distrbg. Co. 214-231-0170
WA Seattle, Kam Elctrns. Div. 206-382-1300

INTRA-COMPUTER, 101 W. 31st St., New York, NY 10001, Tel: 212-947-5533, FAX: 212-947-5984; Empl.: 9; *Sls. Mgr.:* Art Yaglian

Intronics

FAX: 617-527-3310

INTRONICS, INC., 57 Chapel St., Newton, MA 02158, Tel: 617-964-4000, TELEX: 200095, TWX: 710-335-6835; Empl.: 75 ..... **B•1018; D•1836-1837**

Local Sales Offices & Reps

AL Huntsville, Hughes Assocs. 205-533-9108
AZ Scottsdale, Arcom Sls., Inc. 602-947-5745
CA Los Alamitos, Power Specialists 213-594-9418
CA Mountain View, Marcon Sls., Inc. 415-964-8046
CO Englewood, Component Sls., Inc. 303-779-8060
IL Arlington Hgts., Coombs Assocs. 312-439-9810
IA Cedar Rapids, Technical Elctrns. 319-366-5443
MA Lowell, Underwood Sls. Corp. 617-256-8191
MA Lowell, Underwood Sls. Corp. 508-256-8191
MN Wayzata, Cardinal Sls. Co. 612-475-0042
NJ Livingston, Avemark Tech. Mktg. 201-992-5331
NY Utica, Fiber Instr. Sls. 315-735-1691
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OH Dayton, Del Steffen & Assocs. 513-293-3145
PA New Hope, Intek, Inc. 215-862-5601
VA Reston, Stinson Assocs. 703-478-2252
Can Lachine, Que., Electro Design 514-636-4838
Can Surry, BC, Enerlec Sls., Ltd. 604-888-1667

ION PHYSICS CO., 323 Andover St., Wilmington, MA 01887, Tel: 508-658-6030, TWX: 510-600-6134, FAX: 508-658-9455

IPAC GRP., 3047 Indl. Blvd., Bethel Pk., PA 15102, Tel: 412-831-9200, TWX: 510-697-3935, FAX: 412-831-9580; Empl.: 50; *Sls. Mgr.:* D. T. Cusack

ISKRA ELECTRONICS, INC., 155 Dupont St., Plainview, NY 11803, Tel: 516-349-0222, TELEX: 221527, FAX: 516-349-7642; *Sls. Mgr.:* Debbie Gremito

Local Sales Offices & Reps

CA Arcadia, VanGott & Assoc. 818-445-9728
CA Saratoga, F & F Assoc. 408-446-2349
IL Elmhurst, Utronix Sls. 312-834-1100
IN Ft. Wayne, Naunas Sls. Co. 219-432-4792
LA Hammond, Design Mktg. of LA, Inc. ... 504-542-1115
MN Minneapolis, R.K. Sls. Assocs. Inc. 612-571-1001
NJ Glasboro, R. P. Luce & Co. 609-881-2877,
NY Canastota, DR Huller Assoc. 315-697-9817
NY New Hyde Pk., R. P. Luce & Co. 516-437-4550
NC New Bern, R A Sls. 919-244-2672
OH Mentor, Sales Plus 216-255-6917,
SC Easley, R A Sls. 803-859-1859
TX Rowlett, Champion Sls. Co. 214-475-8813

Local Distributors

NJ Westwood, Seacor 201-666-5600
NY Ronkonkoma, Baldwin Comps. 516-588-5700

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FAX: 516-937-3840

ISL PRODUCTS INT'L, LTD., 235 P Robbins Lane, Syosset, NY 11791-6093, Tel: 516-937-3475, TELEX: 503242; Empl.: 10; *Sls. Mgr.:* Ken Kawaller ..... **A•1085, 2312; C•1386, 1864; D•2240**

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IL Chicago, Golbeck Milota Assoc. 312-705-0602
IN Indianapolis, C.C. Electro Sales 317-255-1508
MN St. Paul, Countryman Assoc. 612-645-9151

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FAX: 804-977-1849

ISOTEMP RESEARCH, INC., 1750 Broadway St., P.O. Box 3389, Charlottesville, VA 22901, Tel: 804-295-3101; FSC No.: 031785; Empl.: 58 ..... **A•1412-1413**

Local Sales Offices & Reps

CA Fremont, Wm. Parks & Assocs. 415-796-0875
CA San Diego, Qualtronics 619-695-0118
IL Woodridge, Trend-Tronics 312-985-0626
NC Raleigh, Godwin Assocs. 919-847-3006

ISOTRONICS, INC., Industrial Park, New Bedford, MA 02745, Tel: 508-998-2000, TWX: 710-344-1961; *Sls. Mgr.:* Jeffrey Lang

ITEK ENCODER, 27 Christina St., Newton, MA 02161-1953, Tel: 617-969-7300, TWX: 710-335-6783, FAX: 617-964-3705; Empl.: 100 ..... **B•1960-1961**

Local Sales Offices & Reps

CA Long Bch., Itek Encoder 213-598-8575
CA Montrose, Luscombe Engrg. 818-249-9000
FL Orlando, K. S. Chaney 407-293-5656
IL Des Plaines, Marsland Assocs. 312-298-2620
MI Grand Rapids, Midwest & Meridian Corp. 616-698-7391
MN Minneapolis, Marsland Assocs. 612-545-4481
MO St. Louis, Midwest & Meridian Corp. ... 314-878-4441
NJ Metuchen, Itek Encoder 201-548-1500
TX Garland, Carey, McMahill & Assocs., Inc. 214-681-1414
WI New Berlin, Marsland Assocs., Inc. 414-786-6611

ITHACO, INC., Meas. & Control Instrs. Div., 735 W. Clinton St, P.O. Box 6437, Ithaca, NY 14851-6437, Tel: 607-272-7640, TWX: 510-255-9307, FAX: 607-272-4550; Empl.: 120; *Sls. Mgr.:* E. W. Seymour

ITL CIRCUITS, 90 Don Park Road, Markham, Ontario, Canada L3R 1C4, Tel: 416-475-6658, 416-492-9307, FAX: 416-475-5097; FSC No.: FSCM 38747; Empl.: 90; *Sls. Mgr.:* Derk Wissink

ITT CANNON:MILITARY/AEROSPACE DIV., 666 E. Dyer Road, Santa Ana, CA 92705-5684, Tel: 714-557-4700, TELEX: 75-3917, TWX: 910-997-0523; FSC No.: 71468;Multiple; Empl.: 2000; *Sls. Mgr.:* Richard Torson; *Dist. Mgr.:* Richard Torson

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ITT COMPONENTS, ITT Corporation, 5 Jenner St., Irvine, CA 92718, Tel: 714-727-3001, TELEX: 681-389, TWX: 910-595-1744; FSC No.: 61725; Empl.: 29; *Dist. Mgr.:* M. Pommier ..... **A•1086-1087; B•1544-1551**

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AL Huntsville, JWL 205-883-1712
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CA Burbank, Darco 818-504-2425
CA San Jose, Eclipse 408-437-7575
CO Englewood, Romulus Elctrns. 303-770-4888
CT Guilford, Data Mark, Inc. 203-453-0575
FL Pompano Bch., Bolton Assocs. 305-781-8887
GA Atlanta, JWL 404-320-7643
IL Rolling Meadows, Heartland Tech. Sls. 312-577-9222
IN Ft. Wayne, M/S Sls. 219-436-3023
KS Wichita, Thunderbird Tech. Sls. 316-684-3941
MD Lutherville, PGR 301-583-1360
MA Sudbury, KSA of New England 617-443-5881
MI Brighton, Elctrn. Sources Inc. 313-227-3598
MN Minnetonka, J.P. & Assocs. 612-935-7930
MO Maryland Hgts., Thunderbird Tech. Sls. 314-298-8940
NM Albuquerque, Syntech 505-266-7951
NY Fairport, Net Sls. Co. 716-223-1030
NY Manhasset, Win Cor Elctrns. 516-627-9474
NC Pineville, JWL & Assocs. 704-541-5750
OH Centerville, Omega Sls. 513-434-5507
OH Shaker Hgts., Omega Sls. 216-751-9600
PA Prospect Pk., Elf Sls. 215-534-3340
TX Richardson, Milco Mktg. 214-783-2716
WA Redmond, EMG 206-882-0962

Local Distributors

AL	Huntsville, Time	205-721-1133
AZ	Tempe, Richey Impact Elctrns.	602-894-9251
AZ	Tempe, Shelley Ragon	602-894-2058
AZ	Tempe, Time	602-967-2000
CA	Anaheim, Time	714-937-0911
CA	Chatsworth, Shelley Ragon	818-998-3333
CA	Chatsworth, Time	818-998-7200
CA	Garden Grove, Richey Impact Elctrns.	714-895-0060
CA	Huntington, Capacitor Spec.	714-843-1815
CA	Irvine, Integrated Elctrns.	714-837-9960
CA	Irvine, ITT Multi Comps.	714-727-4001
CA	Sacramento, Integrated Elctrns.	916-424-5297
CA	San Diego, Richey Impact Elctrns.	619-271-4511
CA	San Diego, Shelley Ragon	619-453-7133
CA	San Diego, Time	619-586-1331
CA	San Jose, Integrated Elctrns.	408-263-1100
CA	San Jose, ITT Multicomps.	408-279-0685
CA	San Jose, Shelley Ragon	408-942-9111
CA	Santa Clara, Richey Impact Elctrns.	408-727-7411
CA	Santa Monica, Master Distrs.	213-452-1229
CA	Sunnyvale, Capsco Sls.	408-734-3020
CA	Sunnyvale, Time	408-734-9888
CO	Denver, Integrated Elctrns.	303-292-6121
CO	Englewood, NEP Elctrns.	303-799-9898
CO	Englewood, Shelley Ragon	303-762-0670
CO	Englewood, Time	303-799-8851
CT	Cheshire, Time	203-271-3200
CT	East Haven, J.V. Elctrns.	203-469-2321
CT	New Haven, Greene Shaw Co.	203-397-0710
FL	Davie, ARCO Distrs.	305-473-2550
FL	Ft. Lauderdale, NRC	305-772-4500
FL	Ft. Lauderdale, Time	305-974-4800
FL	Orlando, Time	305-841-6565
FL	Tampa, Shelley Ragon	813-623-6560
GA	Norcross, Time	404-448-4448
IL	Chicago, Leeds Electro Comps.	312-825-3800
IL	Chicago, NEP Elctrns.	312-625-8400
IL	Hoffman Estates, Integrated Elctrns.	312-843-2040
IL	Lombard, Shelley Ragon	312-629-8833
IL	Wood Dale, Time	312-350-0610
IN	Indianapolis, CSE	317-879-9119
IN	Indianapolis, Mar Elctrns.	317-633-6699
IA	Cedar Rapids, Shelley Ragon	319-373-0525
MD	Beltsville, RESCO-Washington	301-937-9100
MD	Columbia, Time	301-964-3090
MD	Jessup, TREEKO Sls.	301-792-0112
MD	White Marsh, Resco	301-529-0500
MA	Canton, Impact Sls.	617-821-1500
MA	Newton, Greene-Shaw Co.	617-969-8900
MA	Peabody, Time	508-532-6200
MI	Livonia, Key Elctrns.	313-261-5972
MN	Edina, Time	612-835-1250
MN	Minneapolis, Sterling	612-831-2666
MN	St. Paul, Shelley-Ragon	612-642-2828
MS	Hazelwood, Shelley-Ragon	314-454-0480
MO	Independence, Shelley-Ragon	816-254-3410
MO	St. Louis, Time	314-391-6444
NV	Las Vegas, Kiesub Elctrns.	702-733-3888
NJ	Oakland, Relay Specialties	201-337-1000
NJ	Pinebrook, Time	201-882-4611
NJ	Rockaway, Tonar Inds.	201-586-9000
NJ	W. Berlin, GCI	609-768-6767
NM	Albuquerque, Betatron Elctrns.	505-344-2381
NY	E. Syracuse, Time	315-432-0355
NY	Hauppauge, Time	516-273-0100
NY	Medford, Shelley-Ragon	516-447-2000
NC	Charlotte, Time	704-522-7600
NC	Oxford, Time	919-693-5166
OH	Cincinnati, Schuster	513-489-1400
OH	Cleveland, Schuster	216-425-8134
OH	Dublin, Time	614-761-1100
OK	Tulsa, Altair Co.	918-252-5781
OR	Beaverton, Integrated Elctrns.	503-641-1690
OR	Portland, Time	503-684-3780
OR	Wilsonville, Shelley Ragon	503-641-1691
PA	Essington, Tri-Com	215-521-3080
PA	King of Prussia, Time	215-337-0900
TX	Austin, Time	512-339-3051
TX	Carrolltown, Time	214-241-7441
TX	Dallas, Shelley Ragon	214-349-2424
TX	El Paso, International Elctrns.	915-598-3406
UT	W. Valley, Beta	801-966-0236
UT	W. Valley, Time	801-973-8181
WA	Bellevue, Integrated Elctrns.	206-455-2727
WA	Redmond, Time	206-882-1600
WA	Seattle, Richey Impact Elctrns.	206-575-1910
WA	Seattle, Shelley Ragon	206-241-1980
WI	New Berlin, NEP Elctrns.	414-785-9100

ITT ELECTRON TUBE, ITT Corp., Box 100, Easton, PA 18042, Tel: 215-252-7331, TELEX: 847494; FSC No.: 20948; Empl.: 350

ITT GILFILLAN, ITT Corp., 7821 Orion Ave., P.O. Box 7713, Van Nuys, CA 91409, Tel: 818-988-2600, TELEX: 651421, TWX: 910-495-1787; FSC No.: 24930; Empl.: 1800; *Sls. Mgr.:* Hollis White

ITT-HIGBIE MFG., Wagner Rd., Rochester, MI 48063, Tel: 313-651-5300, FAX: 313-651-2365; Empl.: 1500; *Sls. Mgr.:* R.M. Davie VP Sls.

ITT POWERSYSTEMS CORP., Box 688, Galion, OH 44833-0688, Tel: 419-468-5200, TELEX: 4972923, FAX: 419-468-3235; Empl.: 450; *Sls. Mgr.:* C. Searles; *Dist. Mgr.:* G. Ardolino

ITT Schadow

FAX: 612-934-9121

ITT SCHADOW, 8081 Wallace Rd., Eden Prairie, MN 55344, Tel: 612-934-4400, TELEX: 29-0556, TWX: 910-576-2469; Empl.: 150; *Sls. Mgr.:* Darrell Wilk; *Dist. Mgr.:* Scott Mork ..... **B•1758-1761**

Local Sales Offices & Reps

AL	Huntsville, Brandel-Stephens	205-883-0445
AZ	Phoenix, Shefler-Kahn	602-257-9015
CA	Carlsbad, Adchem	619-72909216
CA	Los Angeles, Landa & Assocs.	213-879-0770
CA	Mountain View, Straube Assocs.	415-969-6060
CA	Santa Ana, Landa & Assocs.	714-543-7805
CO	Boulder, Component Prod. Sls.	303-530-2800
CT	Guilford, Richard Purinton Inc.	203-453-4505
FL	Deerfield Beach, Brandel-Stephens	305-427-8558
FL	Orlando, Brandel-Stephens	305-425-3202
GA	Atlanta, Brandel-Stephens	404-261-7579
ID	Boise, J.J. Backer	208-622-7045
IL	Elk Grove, Control Sls.	312-595-2110
IN	Indianapolis, EMCI (Elec. Mktg. Consits., Inc.)	317-253-1668
IA	Marion, S.W.Assocs.	319-377-5244
KS	Parker, S.W. Assocs.	913-898-6552
MA	Andover, Richard Purinton, Inc.	617-475-7055
MI	Brighton, A.P. Assocs.	313-229-6550
MN	Eden Prairie, Hanna/Lind	612 942-8554
MO	St. Louis, S.W. Assocs.	314-576-4650
NJ	W. Caldwell, Grimm, Siegal Assocs.	201-575-9300
NM	Albuquerque, Shefler- Kahn	505-294-0499
NY	East Rochester, L-Mar, Inc.	716-381-9100
NC	Greensboro, Brandel-Stephens	919-274-6952
OH	Dayton, K. W. Elctrns.	513-890-2150
OH	Shaker Heights, K.W. Elctrns.	216-491-9177
OR	Beaverton, James J. Backer Co.	503-627-0775
PA	Allison Pk., K.W. Elctrn. Sls., Inc.	412-487-4300
PA	Trevose, P.S.A., Inc.	215-245-0513
TX	Austin, Fralia & Assocs.	512-835-7911
TX	Euless, Fralia & Assocs.	817-267-3577
TX	Houston, Fralia & Assocs.	713-772-1572
WA	Seattle, Jas. J. Backer Co.	206-285-1300
WI	Brookfield, Control Sls.	414-797-9500
Can	Rexdale, Electro Source	416-675-4490

Local Distributors

AZ	Tempe, Time Elctrn.	602-967-2000
CA	Garden Grove, Impact	213-768-3800
CA	Gardena, Cal-Switch	213-538-9830
CA	Irvine, ITT Multicomponents	714-727-3001
CA	Riverside, Electronic Supply	714-787-9220
CA	Santa Clara, Cypress	408-980-2500
CA	Sunnyvale, Time Elctrns.	408-734-9888
CO	Denver, Integrated Elctrns.	303-292-6121
FL	Fort Lauderdale, Time Elctrn.	305-974-4800
FL	Orlando, Hallmark	305-855-4020
IL	Crystal Lake, Sub-Sem	312-782-3954
IL	Wheeling, Hawk Elctrns.	312-459-4030
KS	Wichita, R.S.C. Elctrns.	316-267-5213
MD	Jessup, Treeko Sls.	301-470-3300
MA	Canton, Richey /Impact Sls. Co.	617-821-1500
MA	Hingham, Sager Elec.	617-749-6700
MI	Kentwood, R.M. Elctrns.	616-531-9300
MI	St. Clair Shores, Specialties Mfg.	313-771-2700
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NJ	Oakland, Relay Specialties	201-337-1000
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ITT SEMICONDUCTORS, ITT Corp., 55 Merrimack St., So. Lawrence, MA 01843, Tel: 617-688-1881, TELEX: 947413, FAX: 617-975-7109; Empl.: 2300; *Sls. Mgr.:* S. Rastogi; *Dist. Mgr.:* S. Rastogi

ITW CORTRON, Illinois Tool Works, 400 W. Grand Ave., Elmhurst, IL 60126, Tel: 312-279-9110, FAX: 312-279-9709; Empl.: 125; *Sls. Mgr.:* Ken Buheit

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FAX: 804-239-4730

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AL Huntsville, ACM, Inc. 205-881-5493
AZ Paradise Valley, Astrocom Mktg. 602-991-6646
CA Northridge, Pacific Elec. Assoc. 818-701-0114
CA Playa-del-Ray, Corcoran Assoc. 213-823-4589
CA Santa Clara, Synelect Mktg. 408-244-9900
CO Parker, High Plains Mktg. 303-841-6464
FL Cassel Berry, Dyne-A-Mark 407-831-2822
FL Clearwater, Dyne-A-Mark 813-441-4702
FL Ft. Lauderdale, Dyne-A-Mark 305-771-6501
GA Norcross, ACM, Inc. 404-448-7025
IL Rolling Meadows, Weisser Assoc. 312-392-5556
IN Indianapolis, Central Regional Off. 317-257-3704
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MO Earth City, SPS Assocs., Ltd. 314-291-0520
NE Panama, SPS Assocs. 402-788-2536
NY E. Rochester, L-Mar Assocs., Inc. 716-681-9100
NY Poughkeepsie, L-Mar Assoc. Inc. 914-462-8025
NC Raleigh, C-Tech 919-782-8100
OH Solon, J R Thornberry Co. Inc. 216-248-4995
TX Austin, Electra Reps, Inc. 512-339-1163
TX Dallas, Electra Reps, Inc. 214-248-3852
VA Lynchburg, Paktron Div. 804-239-6941
WA Bellevue, Caruso & Co. 206-455-8811
WI Hartland, Selective Sls. Inc. 414-367-1133
Can Markham, Ont., Avotronics 416-475-2024
Can Pointe Claire, Que., Avotronics 514-697-2135

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CA Chatsworth, Future Elctrns. 818-772-6240
CA Irvine, Acacia/Deanco 714-660-0834
CA Irvine, Future Elctrns. 714-250-4141
CA San Diego, Acacia/Deanco 619-565-4365
CA San Diego, Future Elctrns. 619-278-5020
CA San Jose, Future Elctrns. 408-434-1122
CA Sunnyvale, Acacia/Deanco 408-745-7200
CA Van Nuys, E.W. Elctrns. 818-782-9020
CO Westminster, Future Elctrns., Inc. 303-650-0123
CT Bethel, Future Elctrns. 203-743-9594
FL Altamonte Springs, Future Elctrns., Inc. 305-767-8414
FL Cassel Berry, Hall-Mark Elctrns. 407-830-5855
FL Clearwater, Future Elctrns., Inc. 813-578-2770
FL Clearwater, Hall-Mark Elctrns. 813-530-4543
FL Ft. Lauderdale, N R C Elctrns. 305-772-4500
GA Augusta, Dixie Elctrns., Inc. 404-722-2055
GA Norcross, Future Elctrns., Inc. 404-441-7676
IL Elk Grove Village, Bell Inds. 312-640-1910
IL Rolling Meadows, RM Elctrns. Co. 312-358-0300
IL Schaumburg, Future Elctrns. 312-882-1255
IN Indianapolis, Advent Elctrns. 317-872-4910
IN Indianapolis, Custom Svcs. Elec. 317-879-9119
IN Indianapolis, RM Elctrns. Co., Inc. 317-291-7110
IA Cedar Rapids, Dee Elctrns. 319-365-7551
MD Columbia, Future Elctrns. 301-290-0600
MD Jessup, Treeko Sls. 301-470-3300
MD Spencerville, U.S. Elctrns. 301-384-3300
MA Billerica, Mayer Elctrns. 508-667-6900
MA Westboro, Future Elctrns. 617-366-2400
MI Grand Rapids, RM Elctrns. Co. 616-531-9300
MI Livonia, Future Elctrns. 313-261-5270
MN Eden Prairie, Future Elctrns. 612-944-2200
MN Eitzen, Capacitor Assocs. 507-495-3306
MN St. Paul, Gopher Elctrns. 612-483-3322
MO St. Charles, Finnigan Elctrns. 314-946-6201
NJ Bellmaur, Mid Atlantic Elctrns. 609-931-5303
NJ E. Hanover, State Elctrns. 201-887-2550
NJ Fairfield, Future Elctrns. 201-227-4346
NJ Mt. Laurel, Future Elctrns. 609-778-7600
NY Farmingdale, Pride Elctrns. 516-293-4020
NY Hauppauge, Broadline Elctrns. 516-231-4100
NY Hauppauge, Future Elctrns. Inc. 516-234-4000
NY Liverpool, Future Elctrns. 315-451-2371
NY Rochester, Future Elctrns. 716-272-1120
NY Rochester, Simcona Elctrns. 716-328-3230
NC Charlotte, Dixie Elctrns. 704-377-5413
NC Charlotte, Elctrn. Mktg. Corp. 704-394-6195
NC Charlotte, Future Elctrns. 704-529-5500
NC Greensboro, Golden Elctrns. 919-294-4653
NC Winston-Salem, Dixie Elctrns. 919-724-5961
OH Columbus, Elctrn. Mktg. Corp. 614-299-4161
OH Dayton, Elctrn. Mktg. Corp. 513-439-4711
OH Highland Heights, Elctrn. Mktg. Corp. 216-442-3441
OK Tulsa, Altair Co. 918-252-5781
OR Beaverton, Acacia/Deanco 503-646-3377
OR Beaverton, Future Elctrns. 503-646-9454
OR Lake Oswego, Bell Inds. 503-241-4115
PA McKean, Advacom, Inc. 814-476-7774
SC Columbia, Dixie Elctrns., Inc. 803-779-5332
SC Greenville, Dixie Elctrns., Inc. 803-297-1435
SC N. Charleston, Dixie Elctrns. 803-552-2671
TN Gray, Dixie Elctrns., Inc. 615-477-3838
TN Knoxville, Dixie Elctrns., Inc. 615-938-4131
TX Austin, Altair Co. 512-837-4970
TX Houston, Altair Co. 713-462-3029
TX Richardson, Altair Co. 214-231-5166
TX Richardson, Future Elctrns., Inc. 214-437-2437
UT Salt Lake City, Future Elctrns. Inc. 801-972-8489
WA Redmond, Future Elctrns., Inc. 206-881-8199
WI Mequon, Taylor Elec. 414-241-4321
WI Racine, Badger Elctrns. Co. Inc. 414-637-1256
WI Waukesha, Bell Inds. 414-547-8879
EXP Bucks, Eng., C & CD Ltd. 494-882-848
Can Calgary, Alberta, Future Elctrns. 403-235-5325
Can Downsview, Ont., Future Elctrns. 416-638-4771
Can Edmonton, Future Elctrns. 403-438-2858
Can Ottawa, Ont., Future Elctrns. 613-820-8313
Can Point Claire, Que., Future Elctrns. 514-694-7710
Can St. Foy, Que., Future Elctrns. 418-682-8092
Can Vancouver, B.C., Future Elctrns. 604-294-1166
Can Winnipeg, Manitoba, Future Elctrns. 204-786-7711

ITW Switches

FAX: 312-545-4450

ITW SWITCHES, Illinois Tool Works, 6615 W. Irving Park Rd., Chicago, IL 60634, Tel: 312-282-4040, TELEX: 275226; Empl.: 500; *Sls. Mgr.:* R. Mueller; *Dist. Mgr.:* P. Barthell ..... B•1762-1774

Local Sales Offices & Reps

AL Huntsville, Electro Mech 205-880-0592
AZ Glendale, The Knight Co. 602-433-2166
AR Fort Smith, Electra Reps 501-452-7822
CA Los Angeles, The Knight Co. 213-670-2833
CA Santa Clara, Westrep 408-988-8833
CO Parker, High Plains Mktg. 303-841-6464
CT Clinton, Selmark Assoc. 203-573-9088
FL Altamonte Springs, Semtronics 407-831-8233
GA Atlanta, Electro Mech. 404-447-6478
IL Elk Grove Village, Parcom 312-228-6360
IA Cedar Rapids, R. F. Welch Co. 319-362-6824
KS Kansas City, BC Elctrns. 913-342-1211
MD Baltimore, MicroComp 301-644-5700
MA Millis, Selmark Assoc. 508-376-2914
MI Grand Rapids, Urban & Assoc. 616-245-0511
MN Minneapolis, Comstrand 612-788-9234
MO St. Louis, BC Elctrns. 314-521-6683
NJ Red Bank, Varrelman-Gorman Co. 201-219-0088
NY E. Syracuse, Fountain, Young & Co. 315-437-7733
NC Raleigh, Electro Mech 919-790-9300
OH Medina, Rockford Controls 216-725-3705
PA Oreland, Precision Mktg. 215-233-9233
TX Dallas, Electra Reps. 214-248-3852
WA Redmond, EMG-Elctrn. Mktg. Grp. 206-882-0962
WI Mequon, Parcom Inc. 414-241-8544

IVEK CORP., 43 Fairbanks Rd., N. Springfield, VT 05150, Tel: 802-886-2238, FAX: 802-886-8274; Empl.: 8; *Sls. Mgr.:* Peter Torney

IVO

FAX: 201-542-2938

IVO INDUSTRIES, INC., 201 Industrial Way W., Eatontown, NJ 07724, Tel: 201-542-5151, 800-932-0489, TELEX: 132-414; Empl.: 10; *Sls. Mgr.:* Daniel Vannote ..... B•1089, 1775, 1962; D•1148-1149

Local Sales Offices & Reps

CA Tustin, Sierra-Pacific Engrg. 714-731-3411

Local Distributors

CA Agoura, Sibbald Instrs. 213-991-3864
CA Santa Monica, Master Distr. 213-452-1229
FL Lakeland, A A Electric 813-665-6941
GA Norcross, A A Electric 404-449-8670
IL Arlington Heights, Martec Assocs. 312-956-8090
MD Towson, Kraft Indl. 301-828-5838
MN St. Paul, Power/Mation Div. 612-645-0781
NJ E. Rutherford, A A Electric 201-777-5477, 800-223-0119
NY Clarence, Trott Elctrns. 716-634-8500
NC Charlotte, Trott Elctrns. 704-376-2237
NC Huntersville, Scott Equip. 704-875-1611
SC Greenville, Automation Supp. Co. 800-845-5274
TX Dallas, Dallas Meter Tek 214-349-6044
WI Waukesha, Power/Mation Div. 414-542-2868
WI Wausau, Control Specialist 715-359-9122
Can Edmonton, Alberta, Alberta Indl. Controls 403-468-6080
Can Surrey, B.C., E.B. Horseman & Son Ltd. 604-533-1275
Can Toronto, Ontario, Lisle-Metrix Ltd. 416-249-9151

IXYS CORP., 2355 Zanker Rd., San Jose, CA 95131-1109, Tel: 408-435-1900, TELEX: 384928 SNJ SU; FSC No.: 408-435-1033; Empl.: 50; *Sls. Mgr.:* Dan Schwob

JAE
JAE Electronics, Inc.

FAX: 714-250-8957

JAE ELECTRONICS INC., 1901A E. Carnegie Ave., Santa Ana, CA 92705-5504, Tel: 714-250-8770, TELEX: 681-438 JAE US; Empl: 3400 (Worldwide); *Sls. Mgr.:* David Shaff, Dir. Field Sls.; *Dist. Mgr.:* N. Leidig ..... **B•1776-1777; C•1388-1391**

Local Sales Offices & Reps

AL	Huntsville, Glen White Assocs.	205-882-6751
AZ	Glendale, Camda, Inc.	602-842-2927
CA	Canoga Pk., Camda, Inc.	818-703-6132
CA	Lawndale, Camda, Inc.	213-219-0320
CA	Newport Beach, Camda, Inc.	714-852-9228
CA	San Diego, Camda, Inc.	619-571-4818
CA	Santa Clara, Pinnacle Sls.	408-249-7400
CO	Littleton, Con-Tek Mktg.	303-973-8490
CT	Southington, Cycle Sls.	203-755-2888
FL	Clearwater, Glen White Assocs.	813-726-0577
FL	Ft. Lauderdale, Glen White Assocs.	305-977-5885
FL	Ft. Lauderdale, JAE Elctrns.	305-563-3484, 800-248-0737
FL	Satellite Bch., Glen White Assocs.	305-773-4832
GA	Norcross, Glen White Assocs.	404-441-1447
IL	Arlington Hgts., Berndt Assocs. Inc.	312-632-0900
IN	Ft. Wayne, Frank J. Campisano Co.	219-486-6443
IN	Indianapolis/Ft. Wayne, Campisano Co.	317-253-7651
MD	Baltimore, Glen White Assocs.	301-321-7235
MA	Harvard, Cycle Sls.	617-456-6868
MN	Minneapolis, Berndt Assocs., Inc.	612-546-2021
MS	Jackson, Glen White Assocs.	601-856-5411
NJ	Mountainside, Henry R. Richter Co.	201-233-4615
NY	Fayetteville, Henry G. Richter Co.	315-637-6713
NC	Greensboro, Caravan Sls.	919-294-1500
NC	Raleigh, Glen White Assocs.	919-848-1931
OH	Cincinnati, Campisano Co.	513-574-7111
OH	Cincinnati, Frank J. Campisano Co.	513-574-7111
OH	Columbus, Campisano Co.	614-876-5405
OH	Medina, Frank J. Campisano Co.	216-722-5550
OH	Mentor, Frank J. Campisano	513-575-7111
OH	Mentor, Frank J. Campisano Co.	216-257-2961
OR	Hillsboro, Rhodes Sls. Corp.	503-640-6666
PA	Coraopolis, Campisano Co.	412-264-5151
PA	Phoenixville, Henry G. Richter Co.	215-495-6176
PA	Phoenixville, Henry Richter, Inc.	215-495-6176
SC	Greenville, Ellenburg Sls.	803-233-9942
TN	Gray, Glen White Assocs.	615-477-8850
VA	Annandale, Glen White Assocs.	703-354-3889
VA	Lynchburg, Glen White Assocs.	804-385-6110
WA	Bellevue, Electronic Sources	206-451-3500
WI	Milwaukee, Berndt Assocs., Inc.	414-545-8400

Local Distributors

AZ	Scottsdale, Cypress Elctrns.	602-949-0802
CA	Buena Pk., Cypress Elctrns.	213-744-0355, 714-521-5230
CA	San Diego, Cypress Elctrns.	619-535-0011
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CO	Wheatridge, Cypress Elctrns.	303-431-2622
CT	Yalesville, Glynn Elctrns.	203-265-2498
MA	Middleboro, Glynn Elctrns.	617-947-4262
NH	Manchester, Glynn Elctrns.	603-622-8131
NY	Deer Pk., Ramtronix Inc.	516-242-4700
OH	Akron, Aesco Elctrns.	216-762-8818
OH	Columbus, Aesco Elctrns.	614-882-6762
OR	Beaverton, Cypress Elctrns.	503-641-2233
PA	Bristol, AIM Elctrns.	215-785-3500
TN	Hixson, Techni-Tronics	615-842-0514
TX	Dallas, Cypress Elctrns.	214-869-1435
WA	Bothell, Cypress Elctrns.	206-483-1144

JAICO PRODUCTS, Jaidinger Mfg. Co., Inc., 1921 W. Hubbard St., Chicago, IL 60622, Tel: 312-421-1090, FAX: 312-421-1165; Empl: 35; *Sls. Mgr.:* John S. Jaidinger

JAMESBURY CORP., Div. of Combustion Engineering, Inc., 640 Lincoln St., Worcester, MA 01605, Tel: 617-852-0200, TELEX: 92-0448, TWX: 710-240-1268; Empl: 900; *Sls. Mgr.:* C. A. Richardson

JAMES ELECTRONICS, 4050 N. Rockwell, Chicago, IL 60618, Tel: 312-463-6500, TWX: 910-221-5034; Empl: 220; *Sls. Mgr.:* Vincent Kennedy

Janco
AN ESOP CORP.

FAX: 818-842-3396

JANCO CORP., Box 3038-Glenoaks Sta., Burbank, CA 91504, Tel: 818-846-1800, TWX: 910-498-2701; FSC No.: 91812; Empl.: 185; *Sls. Mgr.:* Sam Kay, Jr. ..... **B•1778-1779**

Local Sales Offices & Reps

AZ	Tempe, Piper Sls.	602-949-0048
CA	San Diego & So. California, Gabriel & Assoc.	714-666-0660
CA	San Jose, Ruppert Sls. & Engrg.	408-998-8717
CO	Longmont, Piper Sls.	303-651-2378
FL	Orlando, MacKay, Smith & Assocs.	305-423-4353
GA	Atlanta, MacKay, Smith & Assocs.	404-449-7444
IL	Addison, Vikeland Sls.	312-832-8425
IN	Ft. Wayne, Aktron Corp.	219-747-3650
KS	Wichita, T-Bird Tech. Sls. & Svc.	316-684-3941
MD	Ellicott, Tech. Sls. Inc.	301-461-3257
MA	Swansea, Eastrep Co.	617-672-0788
MN	St. Paul, Cahill, Schmitz & Cahill	612-646-7217
MO	Maryland Heights, T-Bird Sls. & Svc.	314-298-8940
NJ	Cherry Hill, Quality Comps.	609-428-6266
NY	Fairport, TAC Sls. Inc.	716-377-2250
NC	Charlotte, MacKay, Smith & Assocs.	704-372-1188
OH	Columbus, Tom Mulligan Company	614-457-2242
TX	Irving, Trice Mktg. Corp.	214-255-1877
WA	Seattle, Norwest	206-827-9562

Local Distributors

CA	Burbank, Merit Comp. Supp.	818-842-7607
CA	Westlake Village, Tech-Cable Prods.	818-991-4697

JAN HARDWARE MFG. CO., 47-27 36th St., Long Island City, NY 11101, Tel: 718-361-0800; FSC No.: 99813; Empl.: 60; *Sls. Mgr.:* Irwin E. Wasserman ..... **C•1582, 1586-1611**

Local Sales Offices & Reps

CA	Hillsboro, Long Assocs.	415-342-6544
CA	San Diego, James E. Fitch & Assocs.	213-945-2624
CA	Santa Fe Springs, James E. Fitch & Assoc.	213-945-2624
IN	Huntingdon, Eliet Sls.	219-356-1866
IA	W. Des Moines, Nevco Inc.	515-225-9866
MD	Gaithersburg, Naudain Assocs. South.	301-258-5040
MA	Brookline, Harman Assoc., Inc.	617-232-6687
MA	Lee, Harman Assoc., Inc.	413-243-1158
MN	Golden Valley, A.I.M.	612-542-8437
MO	Crestwood, Nevco, Inc.	314-343-7406
NJ	Englewood, Harold Gray Assoc.	201-894-0894
NJ	Marlton, Naudain Assoc.	609-983-5300
OH	Kettering, F. L. Ohmer & Assoc.	513-434-1454
OR	Beaverton, Cascade Sls. Co.	503-626-7978
TX	Richardson, AGM Sls. Co.	214-644-1475
Can	Scarborough, Ont., Banke Elctrns., Ltd.	416-292-5152

JAPANESE PRODUCTS CORP., 7 Westchester Plaza, Elmsford, NY 10523, Tel: 914-592-8880, TELEX: 516929 ANS BACK ENFD, FAX: 914-592-7001; Empl.: 8; *Sls. Mgr.:* Don Cassalia

JARO COMPONENTS, INC., 5549 Powerline Rd., Ft. Lauderdale, FL 33309-2883, Tel: 305-771-7000, TELEX: 159007, FAX: 305-772-8899; Empl.: 30; *Sls. Mgr.:* Floyd Burwell; *Dist. Mgr.:* Floyd Burwell

JAYCO PLASTICS OF CALIFORNIA, INC., 507 W. Blueridge Ave., Orange, CA 92665, Tel: 714-974-1701, TELEX: 678401, FAX: 714-998-4954; Empl.: 30 ..... **B•1868-1869**

Local Sales Offices & Reps

AZ	Scottsdale, Advent Comps. Corp.	602-481-0044
CA	San Diego, Coastal Elctrn. Sls.	619-459-4148
CA	Sunnyvale, Pass Assocs.	408-735-9040
CO	Boulder, Stratford Grp.	303-530-3194
IL	Palatine, Somers-Reagan	312-991-1108
NY	New York, Breen Assocs.	201-696-8683

JAYCOR, P.O. Box 85154, San Diego, CA 92138, Tel: 619-453-6580, FAX: 619-452-7899; Empl.: 500; *Sls. Mgr.:* Steven Lutjens

JB ELECTRONIC TRANSFORMERS, 2300 W. Armitage Ave., Chicago, IL 60647, Tel: 312-342-0080, FAX: 312-342-9098; FSC No.: 11700; Empl.: 150

jbm

FAX: 603-623-0446

JBM ELECTRONICS, INC., 531 Front St., Manchester, NH 03102, Tel: 603-623-0222, TELEX: 953134, TWX: 710-220-8978; FSC No.: 62694; Empl.: Approx. 100 ..... **A•1578-1583**

Local Sales Offices & Reps

AL	Huntsville, ACM	205-881-5493
AZ	Scottsdale, Haas & Assoc., Inc.	602-994-3813
CA	San Jose, QCI Assocs.	408-432-1070
CA	San Jose, QCI Assocs., Inc.	408-432-1070
CO	Aurora, High-Tech Assocs.	303-695-1990
CT	N. Haven, Kitchen & Kutchin	203-234-9108
CT	No. Haven, Kitchen & Kutchin	617-239-0212
FL	Altamonte Springs, C Assocs., Inc.	305-831-1717
FL	Deerfield Beach, SEC, Inc.	305-426-4601
GA	Duluth, ACM	404-447-5499
IL	Highland Pk., Bransky Sls.	312-433-2375
MA	Burlington, Kitchen & Kutchin	617-229-2660
MN	Minneapolis, Boerger & Assoc.	612-560-3435
MN	St. Paul, Proud Assocs.	612-646-9428
MO	Lenexa, Midtec Assocs.	913-541-0505
NY	Albany, Reagan Compar	518-489-7408
NY	Roslyn Hgts., November Elctrn. Sls.	516-621-6378
NC	Charlotte, Quantum Mktg.	704-523-8822
NC	Raleigh, Quantum Mktg.	919-846-5728
OR	Portland, Earl & Brown	503-245-2283
PA	Glenside, Koebert & Assoc.	215-887-2310
PA	Glenside, Koebert Assocs.	215-887-2310
TX	Hurst, Procomp Sls.	817-589-0336
TX	Richardson, Procomp Sls.	214-669-1500
WA	Redmond, Earl & Brown	206-885-5064
WA	Renton, Excel Elctrn. Sls.	206-277-0940
WV	Inwood, Koebert Assocs.	304-229-8401
Can	Mississauga, Ont., Hi-Tech Sls.	416-670-0284
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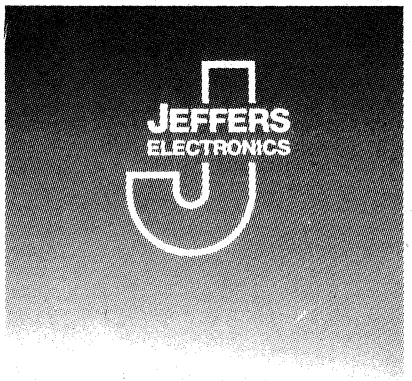

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Local Sales Offices & Reps

MN	Minneapolis, Hei-Lite Sls.	612-861-6051
TX	Dallas/Houston, Elcom Mktg., Inc.	214-241-2166
Can	Thornhill, Ont., R. C. Kahnert Sls., Ltd.	416-221-7755
Can	Winnipeg, Vancouver, Smith-Paterson & Assocs.	604-681-0743

Local Distributors

AL	Montgomery, Southern Controls	205-277-5030
AZ	Tempe, Crompton/Metermaster	714-921-2101
CA	Los Angeles, CMI/Metermaster	213-685-4340
CA	Sacramento, Sacramento Elctrns.	916-441-4821
CA	Wilmington, Wilmington Instrs.	213-834-1133
CO	Denver, E.I.L. Instrs.	303-534-4160
CO	Denver, Ward/Brownell	303-333-3541
CT	Middletown, E.I.L. Instrs.	203-346-6646
FL	Miami, Florida Precision	305-324-1731
GA	Augusta, Speciality Distributing	404-873-2521
IL	Bridgeview, E.I.L. Instrs.	312-430-2292
IL	Elk Grove Village, CMI/Metermaster	312-593-8650
LA	Lafayette, Ralph's Elctrns.	318-234-4507
MD	Sparks, E.I.L. Instrs.	301-771-4800
MA	Burlington, E.I.L. Instrs.	617-272-9450
MI	Grand Rapids, S-F Electra, Inc.	616-459-0216
MN	Minneapolis, Instrument Controls	612-871-2514
MS	Jackson, Ellington Elctrn. Supp.	601-355-0561
NJ	Belleville, Miscorp	201-751-8680
NJ	Newfoundland, Hosica Labs	201-697-6111
NY	Long Island City, Metermod	718-726-4850
NY	Lynbrook, Peerless Radio	516-593-2121
NC	Winston-Salem, Kirkman Elctrns.	919-722-9131
OH	Cleveland, Weschler Elec.	216-238-2550
OH	Dayton, Scott-Friedman	513-298-5555
TN	Nashville, Electra Distributing	615-329-3971
TX	Ft. Worth, Swieco	817-335-6521
TX	Garland, CMI/Metermaster	214-271-5671
TX	Houston, Harrison Equip.	713-879-2600
WA	Seattle, Eicher-Richards	206-523-7888
WV	St. Albans, Preiser Scientific	304-727-2902
Can	Willowdale, Ont., Electrosonic	416-494-1666

JBT INTL. INC., JI Haw Indl. Co., Ltd., 2750 Oregon Ct., Ste. M-9, Torrance, CA 90503, Tel: 213-328-0051, FAX: 213-328-0057

J-B-T SWITCHES, CUTLER-HAMMER PRODS., EATON CORP., Box 1904, New Haven, CT 06509, Tel: 203-772-2220; FSC No.: 55459; Empl.: 160; *Sls. Mgr.:* C. A. Peffer

Refer to Eaton Corp./Cutler-Hammer Prods., Areospace/Commercial Controls Div. for distributor information.

JC SYSTEMS, INC., 11175 Flintkote Ave., San Diego, CA 92121, Tel: 619-453-9980, FAX: 619-453-2115; Empl.: 20; *Sls. Mgr.:* Ralph Aniunas

JDK CONTROLS, INC., 2630 Lavery Ct., Suite F, Newbury Park, CA 91320-1593, Tel: 805-499-7779, FAX: 805-499-0990; Empl.: 40; *Sls. Mgr.:* Reece Kendall ..... **A•2112**

JEFFERS ELECTRONICS, Grand Plaza, 945 Grand Ave., Nogales, AZ 85621, Tel: 602-287-5851, TELEX: 165036; FSC No.: 59474; Empl.: 400; *Sls. Mgr.:* Ken Shobert; *Dist. Mgr.:* Steve Morris

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W. S. JENKS & SON, 1933 Montana Ave., NE, Washington, DC 20002, Tel: 202-529-6020; 800-673-8199, FAX: 202-832-3411 ..... **C•**1752, **D•**1294 689, 764, 817

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FAX: 602-438-1690

JENSEN TOOLS, INC., Axia, Inc., 7815 S. 46th St., Phoenix, AZ 85044, Tel: 602-968-6241, TWX: 910-950-0115; Empl.: 250; *Sls. Mgr.:* Herb Oberman

JEROME INDUSTRIES CORPORATION

FAX: 201-353-1021

JEROME INDUSTRIES CORP., 730 E. Division St., Elizabeth, NJ 07201, Tel: 201-353-5700; Empl.: 150; *Sls. Mgr.:* Anthony Di Girolamo ..... **A•2313; D•1838-1841**

JERSEY SPECIALTY CO., See JSC Wire & Cable

JETA POWER SYSTEMS, INC

FAX: 213-426-2417

JETA POWER SYSTEMS, INC., 2675 Junipero, Signal Hill, CA 90806, Tel: 213-427-0095; Empl.: 110; *Sls. Mgr.:* Derek Steel ..... **D•1843-1845**

Local Sales Offices & Reps

AL	Huntsville, R. O. Whitesell & Assocs.	205-883-5150
CA	Anaheim, Alpha Sls.	213-215-0249
CA	Anaheim, Electro Sls.	714-826-4863
CA	Los Angeles, Power Partners	213-215-0800
CA	Mission Viejo, The Powerhouse, Inc.	714-770-9009
CA	Santa Clara, The Powerhouse	408-748-1555
CO	Arvada, Arrowhead/CSI Sls., Inc.	303-423-5597
CT	Vernon, George Urban & Assocs.	203-647-3991
GA	Atlanta, R. O. Whitesell & Assocs.	404-449-9190
GA	Norcross, R.O. Whitesell & Assocs.	404-449-9190
IL	St. Charles, XYZ Mktg.	312-584-3001
IN	Indianapolis, R. O. Whitesell	317-359-9283
MD	Wheaton, Brimberg Sls.	301-946-2670
MA	Chelmsford, Power Assocs.	617-459-0700
MA	Dover, George Urban & Assocs.	617-329-4068
MN	Minneapolis, Micrelectronic Sls., Inc.	612-829-0948
NH	Londonderry, George Urban Assoc.	603-437-3622
NY	Fairport, Hi-Tec Sls.	716-223-5922
NY	Yonkers, Sonkin Assocs.	914-968-8282
NC	Fuguay-Varina, R.O. Whitesell & Assoc.	919-552-1122
NC	Greensboro, R.O. Whitesell & Assocs.	919-273-1945
OH	Cincinnati, R. O. Whitesell	513-521-2290
OH	Cleveland, R. O. Whitesell	216-447-9020
OH	Columbus, R. O. Whitesell	614-888-9396
OH	Dayton, R. O. Whitesell	513-298-9546
OR	Portland, J. J. Backer Co.	503-297-8744
OR	Salem, Jas. J. Backer Co.	503-362-0717
PA	Huntingdon Valley, Lynbar Grp., Inc.	215-947-3554
PA	Pittsburgh, R. O. Whitesell	412-963-6161
TN	Knoxville, R.O. Whitesell & Assocs.	205-883-5150
TX	Dallas, S. W. Tech. Sls.	214-243-0180
WI	Milwaukee, XYZ Mktg.	312-584-3601
Can	Montreal, Empro Sls.	514-341-6420

JETTRON PRODUCTS INC., P.O. Box 337, E. Hanover, NJ 07936, Tel: 201-887-0571, FAX: 201-887-4182; FSC No.: 04435; Empl.: 30; *Sls. Mgr.:* Joseph E. Fesi ..... **C•1392-1393**

Local Sales Offices & Reps

CA	El Cajon, A-Tronics	619-444-1501
CA	Woodland Hills, A-Tronics	818-703-7212
NY	New York, Eltron Export Co.	212-944-7635

JEWELL ELECTRICAL INSTRUMENTS, 850 Perimeter Rd., Manchester, NH 03108-4038, Tel: 603-669-6400, TELEX: 943435 JEWELL MAN, FAX: 603-669-5962; Empl.: 250; *Sls. Mgr.:* George Molleur; *Dist. Mgr.:* Bill Bolia

JFD ELCTRNS., See Murata Erie No. Amer., Inc.

JF MICROSYSTEMS, 3641 Frontier Road, Pasco, WA 99301, Tel: 509-297-4294, 800-532-2737; Empl.: 2; *Sls. Mgr.:* Jim Follansbee

JFW INDUSTRIES, INC., 5134 Commerce Sq. Dr., Indianapolis, IN 46237, Tel: 317-887-1340, FAX: 317-881-6790; FSC No.: 61162; Empl.: 80; *Sls. Mgr.:* Jackie Buescher

JKL COMPONENTS CORPORATION

FAX: 818-897-3056

JKL COMPONENTS CORPORATION, 13343 Paxton St., Pacoima, CA 91331, Tel: 818-896-0019; FSC No.: 55335; Empl.: 19; *Sls. Mgr.:* Mike Wolford; *Dist. Mgr.:* Bob Brandt ..... B•1163

Local Sales Offices & Reps

AL	Huntsville, Southern Sls. & Mktg.	205-830-9322
AZ	Mesa, Elec-Com Assocs.	602-844-0566
AZ	Tempe, Elec-Com	602-967-8644
CA	San Diego, Lawsco	619-755-0200
CT	Manchester, Manurep, Inc.	203-646-6064
FL	Seminole, Q-Rep	813-393-6393
IL	Park Ridge, Bob Burns & Assocs.	312-823-9360
IN	Carmel, APEX TEC, Inc.	317-846-3333
IN	Indianapolis, Apex-Tec, Inc.	317-842-5559
MI	Farmington Hills, Clark Sls.	313-553-0610
MN	Bloomington, Mumco	612-854-4161
NY	Syracuse, Lamtec	315-682-4780
OH	Chagrin Falls, Clark Sls. Co.	216-247-7848
OH	Painsville, Clark Sls. Co.	216-247-7848
PA	Philadelphia, Check Assoc.	215-487-3007
TX	Irving, Kite Elec. Sls.	214-986-0321

Local Distributors

AL	Huntsville, Powell Elec.	205-539-2731
AL	Mobile, Specialty Distr. Co.	205-344-0450
AZ	Phoenix, Capital Elctrns.	602-252-5899
CA	Garden Grove, Richey Western	714-895-0060
CA	Gardena, Cal. Switch & Signal	213-770-2330
CA	San Jose, Powell Elec.	408-943-9020
CA	Santa Clara, Richey/Western Elec.	408-727-7411
CA	Sunnyvale, Target Elec.	415-961-1170
CT	Cheshire, Time Elec.	203-271-3200
FL	Clearwater, Elec. Precepts of FL	813-544-3636
FL	Tampa, Specialty Distr. Co.	813-870-3315
GA	Norcross, Specialty Distrbg. Co.	404-446-3190
IL	Wheeling, Hawk Elec.	312-459-4030
IN	Indianapolis, Meunier Elctrns.	317-635-3511
IA	Cedar Rapids, Advnet Elec.	319-363-0221
KY	Louisville, Peerless Elec.	502-637-7674
MD	Columbia, Powell Elec.	301-621-8080
MD	Kensington, Marine Air Supp.	301-949-1353
MD	Rockville, M S Elctrns.	301-340-6400
MA	Hingham, Sager Elec.	617-749-6700
MA	Needham, Cronin	617-449-5000
MA	Westborough, Powell Elec.	617-366-6100
MN	Minneapolis, Bergquist Co.	612-835-2322
MN	St. Paul, Gopher Elec.	612-483-4450
MO	Richland, ATR Ent.	314-765-5219
NH	Hudson, Bell Ind.	800-258-1014
NJ	Clifton, Vantage Comps.	201-777-4100
NJ	Englewood, Powell Elec.	201-894-0800
NJ	Pomton Lakes, Pan American Elec.	201-839-0077
NM	Albuquerque, Walker Elec. Supply	505-883-2992
NY	E. Syracuse, Modutex	716-924-4400
NY	Hauppauge, Genelco	516-231-1144
NC	Cary, Powell Elec.	919-467-1212
NC	Greensboro, Hammond	919-275-6391
OH	Cincinnati, Schuster Elec.	216-425-8134
OK	Oklahoma City, Radio Supp. Inc.	405-232-6127
PA	Bristol, Aim Elec.	215-785-3500
PA	Philadelphia, Powell Elec.	215-365-1900
TN	Chattanooga, Specialty Distr. Co.	615-624-1040
TN	Chattanooga, Techni-Tronics	615-875-5449
TX	Dallas, Norvell Comp. Sls.	214-233-0020
TX	Las Colinas, Powell Elec.	214-550-0547
TX	Stafford, Southwest Elec.	713-240-4000
WA	Greenacres, Mica Co.	509-928-1720
WA	Redmond, Priebe Elec.	206-881-2363
WI	Milwaukee, Marsh Elec.	414-475-6000
WI	Oshkosh, Electronic Inds.	414-235-8930

JMJ

FAX: 201-762-9334

JMJ TECHNICAL PRODS., 50 Wheeler Point Rd., Newark, NJ 07105, Tel: 201-589-4257; Empl.: 8; *Sls. Mgr.:* Kevin Kolenut ..... C•1612

JMK

JMK, INC., 15 Caldwell Dr., Amherst, NH 03031, Tel:,,, 603-886-4115, TELEX: 955329; Empl.: 200; *Sls. Mgr.:* J. Kennedy ..... A•1663-1665

Local Sales Offices & Reps

CA	Santa Clara, Cummings & Assocs.	408-247-8656
CO	Englewood, Harthun & Assocs.	303-792-5050
IL	Chicago, Mornak Sls.	312-963-6400
MD	Silver Springs, Mid-Atlantic Sls. Co.	301-593-7749
MA	Framingham, Sullivan Tech. Sls.	617-620-0195
MN	St. Paul, Arkco Sls.	612-777-7454
NJ	Princeton, Murtronics Assocs.	609-394-3737
NY	Syracuse, Nycom Inc.	315-437-8343
OR	Hillsboro, Temco N.W.	503-649-8375
WA	Bothell, Temco N.W.	206-821-5434
Can	Montreal, Que., A. R. Gray	514-694-6378

JMR ELECTRONICS, 1525 Blondell Ave., Bronx, NY 10461, Tel: 212-597-6050, FAX: 212-597-6137; Empl.: 50

JM TRANSFORMER CO., INC., 112 Florida St., Farmingdale, NY 11735, Tel: 516-293-0475, FAX: 516-293-3923; Empl.: 18; *Sls. Mgr.:* J. Millman ..... A•2315-2319

JOBMASTER CORP., 9010 Liberty Rd., Randallstown, MD 21133-0207, Tel: 301-655-1400, 800-642-1400, FAX: 301-521-5461; Empl.: 16; *Sls. Mgr.:* Danielle Hill ..... A•1329

JOHANSON DIELECTRICS, 2220 Screenland Dr., Burbank, CA 91505, Tel: 818-848-4465, TWX: 910-498-2735, FAX: 818-841-7261; Empl.: 300; *Sls. Mgr.:* Fred Luhrs ..... A•1094

Local Sales Offices & Reps

AZ	Phoenix, Compass Mktg. & Sls.	602-996-0635
AZ	Tucson, Compass Mktg. & Sls.	602-293-1220
CA	Mountain View, Straube Assocs.	415-969-6060
CO	Westminster, Straube Assocs.	303-426-0890
FL	Boca Raton, Lawrence Assocs	305-368-7373
FL	Clearwater, Lawrence Assocs.	305-339-3855
IL	Lisle, WG Controls	312-963-5954
IN	Kokomo, Schillinger Assocs.	317-452-4057
KS	Shawnee Mission, Florence & Meyer	913-722-5210
CT	Wethersfield, Compac Sls.	203-563-4784
MI	Troy, C. B. Jensen & Assocs.	313-643-0506
MN	Minneapolis, Bill Deming & Assocs.	612-888-5000
NY	Huntington, Compar New York Inc.	516-423-5660
NY	Syracuse, Pitronics	315-455-7346
NC	Winston-Salem, Murcota	919-722-9445
OH	Westlake, Baehr Greenleaf Assocs.	216-892-1770
PA	Trevose, PSA Co.	215-245-0513
TX	Dallas, C & J Assocs.	214-539-0140
WA	Seattle, Northmar Inc.	206-524-5170

Local Distributors

CA	Los Alamitos, SEMI DICE	213-594-4631
CA	Santa Clara, SEMI DICE	408-980-9777
CA	Sunnyvale, Bell Inds.	408-734-8570
IL	Chicago, Newark	312-638-4411
MA	Canton, Semi Dice	617-821-0070

JOHANSON MANUFACTURING CORPORATION, 400 Rockaway Valley Rd., Boonton, NJ 07005, Tel: 201-334-2676, TWX: 710-987-8367, FAX: 201-334-2954; FSC No.: 91293; Empl.: 200 ..... A•1095

Local Sales Offices & Reps

AL	Huntsville, Murcota Corp.	205-539-8476
AZ	Phoenix, Compass Mktg. & Sls.	602-996-0635
AZ	Tucson, Compass Mktg. & Sls.	602-293-1220
CA	Escondido, Knight Co.	619-743-5136
CA	Los Angeles, Knight Co.	213-670-2833
CA	Mountain View, Straube Assocs.	415-969-6060
CO	Westminster, Straube Assoc., Mt. States	303-426-0890
CT	Wetherfield, Compak, Inc.	203-563-4784
FL	Boca Raton, Perrott Assocs.	305-482-6909
FL	Clear Water Bch., Perrott Assocs.	813-443-5214
FL	Orlando, Perrott Assocs.	305-298-7748
IL	Lisle, W.G. Controls	312-963-5954
IN	Kokomo, Schillinger Assocs.	317-455-2708
IA	Hiawatha, ARD Sales Co.	319-393-6392
MA	Hudson, Compak, Inc.	617-568-0331
MN	Bloomington, Bill Deming & Assoc.	612-888-5000
MO	St. Louis, Midtec Assocs.	314-275-8666
NJ	Boonton, Johanson Mfg. Corp.	201-334-2676
NY	Mount Vernon, Friedman-Smith Elctrn. Sls.	914-664-4866
NY	Pittsford, NHA, Inc.	716-586-9002
NC	Winston-Salem, Murcota Corp.	919-722-9445
OH	Columbus, Baehr, Greenleaf & Assocs.	614-847-0220
OH	Dayton, Baehr, Greenleaf & Assocs.	513-439-0724
OH	Westlake, Baehr, Greenleaf & Assoc.	216-842-1770
PA	Evans City, Baehr, Greenleaf & Assocs.	412-776-2151
PA	Trevose, P.S.A.	215-245-0513
TX	Austin, W. Pat Fralia & Assocs.	512-835-7911
TX	Bedford, W. Pat Fralia Co.	817-267-3577
TX	Houston, W. Pat Fralia & Assocs.	713-772-1572
UT	Salt Lake City, Straube Assocs., Mt. States	801-263-2640
VA	Oakton, PSA South	703-281-1806
WA	Seattle, Northmar	206-524-5170

Local Distributors

AZ	Tempe, Bell Inds.	602-966-7800
CA	Garden Grove, Bell Inds.	714-895-7801
CA	Gardena, Bell Inds.	213-515-1800
CA	San Diego, Bell Inds.	619-268-1277
CA	San Jose, All American Semiconductor	408-287-0190
CA	San Pedro, ASAP Elctrns./West	213-519-8377
CA	Sunnyvale, Bell Inds.	408-734-8570
CA	Thousand Oaks, Bell Inds.	213-826-6778
CA	Van Nuys, CW Swift & Assocs.	818-989-1133
CA	Westlake Vl, Distel, Inc.	805-495-9998
CO	Wheatridge, Bell Inds.	303-424-1985
FL	Deerfield Bch., Bell Inds.	305-421-1997
FL	Orlando, Pelcor Co.	305-299-1541
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Elk Grove Vl, Bell Inds.	312-640-1910
IN	Indianapolis, Bell Inds.	317-634-8202
MD	Baltimore, Radio Elec. Svc.	301-529-0500
MD	Beltsville, Radio Elec. Svc.	301-937-9100
MA	Seekonk, M-Squared	617-761-5490
MA	Wilmington, RC/Jaco Elctrns.	617-273-1860
NM	Albuquerque, Bell Inds.	505-292-2700
NY	Hauppauge, Jaco Elctrns.	516-273-5500
NY	Mt. Vernon, ASAP Elctrns.	914-699-2727
NY	Syracuse, Newark Elctrns.	315-437-6611
OH	Dayton, Bell Inds.	513-435-8660
OR	Lake Oswego, Bell Inds.	503-241-4115
PA	Philadelphia, PEI-Genesis	215-673-0400
TX	Ft. Worth, PATCO Supplies	817-429-8596
TX	Irving, Newark Elctrns.	817-534-3696
UT	Salt Lake City, Bell Inds.	801-972-6969
WA	Bellevue, Bell Inds.	206-747-1515

JOHNSON, E. F., CO., P.O. Box 59089, Minneapolis, MN 55459-0089, Tel: 612-942-1000, TELEX: 290470; Empl.: 1400; *Sls. Mgr.:* Arnie Nickin

JOHNSON CONTROLS, INC., Specialty Battery Div., 900 East Keefe Ave., Milwaukee, WI 53212, Tel: 414-961-6500, FAX: 414-961-6506; Empl.: 400; *Sls. Mgr.:* James M. Szollar

JOLO

FAX: 714-554-0306

JOLO INDUSTRIES, INC., 13921 Nautilus Dr., Garden Grove, CA 92643, Tel: 714-554-6840, TWX: 910-595-1138; FSC No.: 30035; Empl.: 20; *Sls. Mgr.:* J.S. Giampiccolo, Jr. ..... C•1394-1396

Local Sales Offices & Reps

CA	Mountain View, Leddy Assocs.	415-969-6313
CA	Santa Ana, Bee Jay Enterprises	714-836-7870
FL	Longwood, Mathias Assocs., Inc.	407-682-1700
IL	Chicago, McNulty & Assocs.	312-980-9868
MA	Reading, Lincoln Tech. Sls.	617-944-9594
NJ	Berkeley Heights, Cambridge-Allen & Assocs.	201-464-0203
OH	Cleveland, Geotronix Mktg. Assocs.	216-659-6100
WA	Seattle, Evergreen Mktg. Grp. Inc.	206-485-8063
Can	Nepean, Ont., Tech-Trad, Inc.	613-727-1272

Local Distributors

CA	San Ramon, Xstor	415-820-2048
FL	Miami, Elec. Equip.	305-526-6060
NJ	Berkeley Heights, Rockwood Sls. Co.	201-464-0203
OH	Richfield, Alpha Distr. Corp.	216-659-7100

JONARD INDUSTRIES CORP., 134 Marbledale Rd., Tuckahoe, NY 10707, Tel: 914-793-0700, TELEX: 996570, TWX: 710-562-0107, FAX: 914-793-4527; Empl.: 65; *Sls. Mgr.:* R. Fersen

JONATHAN MANUFACTURING CORP., 1101 So. Acacia Ave., Fullerton, CA 92631, Tel: 714-526-4651, FAX: 714-879-1212; Empl.: 375; *Sls. Mgr.:* Todd Leverich; *Dist. Mgr.:* Wm. Wachtel

JONES, HIRAM, ELCTRNS. INC., See Hiram Jones Elctrns. Inc.

JORI RESOURCES, 2128 Knoll Dr., Ventura, CA 93003, Tel: 805-642-2266, FAX: 805-642-5978; Empl.: 4

JOSLYN ELECTRONIC SYSTEMS, P.O. Box 817, Goleta, CA 93116, Tel: 805-968-3551, TWX: 910-334-3464, FAX: 805-968-2335; FSC No.: 23663; Empl.: 210; *Sls. Mgr.:* M. Melcher

JRW INDUSTRIES, INC., 2312 N Second St., Harrisburg, PA 17110, Tel: 717-236-1418; Empl.: 4; *Sls. Mgr.:* Kevin J. Williams, Sls. Mgr.

JSC WIRE & CABLE, Box 248, Burgess Pl., Wayne, NJ 07474, Tel: 201-694-6200, 1-800-572-9473, FAX: 201-694-8297; Empl.: 40; *Sls. Mgr.:* Richard Wojtovitz

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J.S.T. CORP., 1200 Business Ctr. Dr., Ste. 400, Mt. Prospect, IL 60056, Tel: 312-803-3300, FAX: 312-803-4918; *Sls. Mgr.:* Ron Lesky; *Dist. Mgr.:* Ron Lesky

JUDCO MFG. INC., P.O. Box 487-E84, 1429 240th St., Harbor City, CA 90710, Tel: 213-534-0959; *Sls. Mgr.:* Kevin Johnson

JUDD WIRE INC.

FAX: 413-863-2305

JUDD WIRE INC., 57 Turnpike Rd., Turners Falls, MA 01376, Tel: 413-863-4357, TWX: 510-290-2147; FSC No.: 3357; Empl.: 148; *Sls. Mgr.:* Steve Fritz ..... **B•1019; C•1865**

Local Sales Offices & Reps

AL	Huntsville, R & G Assocs.	205-536-6300
AZ	Phoenix, O'Donnell Associates	602-944-9542
CA	El Toro, English/Damco	714-837-3801
CA	Los Altos, Ewing Foley	415-941-4525
CO	Denver, Elcom	303-337-2300
FL	Coral Springs, HAI Elctrns.	305-752-7520
IL	Arlington Heights, Rozner Sls. Co.	312-577-0067
KS	Overland Pk., Spectrum Sls.	913-648-6811
MD	Baltimore, R. A. Wafer Assocs.	301-744-1133
MA	Marlborough, O.K. Engrg.	617-481-6400
MN	Bloomington, EMT Engineering	612-888-1020
MO	Hazelwood, Spectrum Sls.	314-731-5151
NJ	Haddonfield, Mesa Tech. Assocs.	609-429-9531
NM	Albuquerque, O'Donnell Assocs.	505-883-1030
NY	Rochester, Union Marketing	716-546-7820
NC	Resch. Triangle Pk., Naylor Assocs.	919-544-6630
OH	Worthington, Simcox Assocs.	614-885-8776
OR	Beaverton, Jas. J. Backer Co.	503-627-0775
TX	Dallas, Stevens Sls. Co.	214-702-0132
UT	Salt Lake City, Elcom	801-486-4233
WA	Seattle, Jas. J. Backer Co.	206-285-1300

Local Distributors

AL	Madison, Sea Wire & Cable	205-772-9616
CA	Concord, Control Master	415-939-3600
CA	Fountain Valley, innovative Sys.	714-968-6383
CA	Irvine, Republic Elctrns.	714-855-2222
CA	Menlo Park, Bay Associates	415-321-2990
CA	San Leandro, Anixter	415-352-3100
CA	Torrance, Blake Wire & Cable	213-533-8141
CA	Valencia, Wirenetics Co.	805-257-2400
CO	Colorado Springs, SCI	303-598-6888
CT	East Hartford, E. J. Stephens Co.	203-282-9400
CT	Manchester, I.M.S.	203-649-4415
FL	Altamonte Springs, Royce Elctrns.	305-869-4700
FL	Ft. Lauderdale, Anixter	305-485-4455
FL	Ft. Lauderdale, Pacer Elctrns.	305-462-0902
IL	Brookfield, Conductors Unltd.	312-485-7855
MA	Woburn, Pacer Elctrns.	617-935-8330
MN	Bloomington, K. L. Tannehill	612-881-6700
NH	Amherst, North Country Wire & Cable	603-889-0063
NJ	Dover, Electro Spec.	201-361-6300
NY	Apalachin, Rogan Electronics	607-625-2949
NY	Farmingdale, Weico Elctrns.	516-293-0050
NY	Johnson City, HELP Elctrns.	607-729-3528
NY	Rochester, Simcona Elctrn.	716-328-3230
NC	Raleigh, Wholesale Electric	919-878-9400
OH	Dayton, Astro Inds.	513-429-5900
PA	Montgomeryville, Pyttronic Ind.	215-242-6700
TX	Dallas, Interstate Wire	214-553-1311
WA	Tukwila, Carlyle Inc.	206-251-0700
WI	New Berlin, Indl. Elec. Wire & Cable	414-782-2323

JUDD WIRE INC., 870 Los Vallecitos Blvd., San Marcos, CA 92069, Tel: 619-744-7720, TWX: 910-322-1149, FAX: 619-744-6089; FSC No.: 3357

Refer to Judd Wire, Turners Falls, MA for sales office and distributor information.

JULIE RESEARCH

FAX: 212-691-3320

JULIE RESEARCH LABS., 508 West 26 Street, New York, NY 10001, Tel: 212-633-6625, TWX: 710-581-5138; FSC No.: 07062; Empl.: 35; *Sls. Mgr.:* Pamela Spencer; *Dist. Mgr.:* Pamela Spencer ..... **A•1962; D•1300-1303**

Local Sales Offices & Reps

CA	Fresno, Lion Elctrn. Labs	209-233-9096

JUMO PROCESS CONTROL, INC., 37A Woodbine St., Bergenfield, NJ 07621, Tel: 201-501-0060, FAX: 201-501-0205; *Sls. Mgr.:* Bert Robinson

Local Sales Offices & Reps

IL	Addison, Hedge Assoc.	312-543-0888
IL	Chicago, Delta Technical Products	312-631-8899

JUPITER SYSTEMS, 1100 Marina Village Parkway, Alameda, CA 94501, Tel: 415-523-9000, TELEX: 6713004, FAX: 415-523-9151; FSC No.: 63872; *Sls. Mgr.:* Glenn Meyer

KAHGAN ELECTRONICS CORP., 605 Peninsula Blvd., Hempstead, NY 11550, Tel: 516-538-2300, TELEX: 261097 KAHG UR; Empl.: 31; *Sls. Mgr.:* Fred Strauss; *Dist. Mgr.:* Bernard Stapler

KAHLE ENGINEERING, 50 S. Center St., Orange, NJ 07050, Tel: 201-678-2020, TELEX: 42-7757, TWX: 710-992-8835, FAX: 201-678-0326; Empl.: 50; *Sls. Mgr.:* Julie Clark

KAISER ELECTRONICS, Kaiser Aerospace & Elctrns., 2701 Orchard Pkwy., San Jose, CA 95134, Tel: 408-432-3000, TWX: 910-338-0196, FAX: 408-433-0553; Empl.: 1300

KSI

FAX: 508-922-8374

KAISER SYSTEMS, INC., 126 Sohier Road, Beverly, MA 01915, Tel: 508-922-9300; FSC No.: IFD78; Empl.: 100; *Sls. Mgr.:* Steve Swech ..... **D•1846-1849**

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KALAMAZOO TECHNICAL FURNITURE, P.O. Box 1165, Kalamazoo, MI 49005, Tel: 616-385-2255, 800-832-5227; Empl.: 42; *Sls. Mgr.:* B. Smith ..... **C•1058**

KALGLO ELCTRNS. CO., INC., 6584 Ruch Rd., E. Allen Twp., Bethlehem, PA 18017-9359, Tel: 215-837-0700, 800-524-0400, TWX: 510-651-2101, FAX: 215-837-7978; FSC No.: 64521; *Sls. Mgr.:* Christopher L. Criswell

KALMUS & ASSOCS., INC., 2424 S. 25th Ave., Broadview, IL 60153, Tel: 312-343-7004, FAX: 312-343-7016; Empl.: 346

KAM COMPONENTS, INC., P. O. Box 192-EEM, Nesconset, NY 11767, Tel: 516-585-0666, FAX: 516-585-1580; Empl.: 29; *Sls. Mgr.:* Cheryl Day

K&L MICROWAVE, INC., 408 Coles Circle, Salisbury, MD 21801, Tel: 301-749-2424, FAX: 301-749-5725; FSC No.: 50140; Empl.: 550; *Sls. Mgr.:* Charles J. Schaub

K & M ELECTRONICS, 11 Interstate Dr., W. Springfield, MA 01089, Tel: 413-781-1350; FSC No.: 66613; Empl.: 700; *Sls. Mgr.:* Gerard F. Voity ..... **A•1963**

Local Sales Offices & Reps

CA	Fremont, C/G Assocs., Inc.	415-790-1193
CT	Marlborough, Precision Sls., Inc.	203-295-0580
FL	Melbourne, Reynolds & Assocs., Inc.	305-259-7000
IL	Westchester, W. G. Brouillette & Assocs.	312-345-6500
WA	Bellevue, Advanced Power Comps., Inc.	206-747-9127
EXP	Bremen, W. Germany, DK Elctrns.	0421-304-0205
EXP	Tel Aviv, Israel, MTI Engrg., LTD	492101

KAPPA NETWORKS, INC., 1443 Pinewood St., Rahway, NJ 07065, Tel: 201-396-9400, 1-800-223-0603, TELEX: 130081 Kappa Rhwy, FAX: 201-388-4786; FSC No.: 20933; Empl.: 175; *Sls. Mgr.:* Seymour Reich ..... **A•1585-1603**

Local Sales Offices & Reps

AZ Scottsdale, Interstate Marketing 602-244-9050
CA Sherman Oaks, Kappa Networks 818-995-2401
CA Woodland Hills, Interstate Marketing .. 818-883-7606
CO Wheatridge, Wescom Mktg. 303-422-8957
MD Middletown, S.T./Woolard Co., Inc. 301-371-4500
MN Osseo, Gaffney Sls. Co. 612-425-5484
NJ Madison, Livera-Polk Assocs., Inc. 201-377-3220
NY Cazenovia, S.T./Woolard Co., Inc. 315-655-8145
NY Glen Head, Livera-Polk Assocs. 516-759-9300
PA Erdenheim, Omni Sls., Inc. 215-233-4600
TX Austin, Mil-Rep Assocs., Inc. 512-346-6331
TX Houston, Mil-Rep Assocs., Inc. 713-444-2557
TX Richardson, Mil-Rep Assocs., Inc. 214-644-6731
UT Riverdell, Dytox Elctrns. 801-621-0310
UT Salt Lake City, Wescom Mktg. 801-269-0419
VA Lynchburg, S.T./Woolard Co., Inc. 804-528-5421

Local Distributors

CA Sherman Oaks, Delay Line Distrs. Co. 800-624-2617

KAPPA/VIZ TEST EQUIPMENT, 175 Commerce Drive, Ft. Washington, PA 19034, Tel: 215-643-6950, 1-800-523-3696, FAX: 215-643-5237; Empl.: 10; *Sls. Mgr.:* Frank Menichello; *Dist. Mgr.:* Frank Menichello ..... **D•1304-1307**

Local Sales Offices & Reps

AR Little Rock, Leo Barker Co. 501-834-2537
CA N.Hollywood, Bert Moore Assoc. 213-877-5955
CA San Francisco, Tech. Sls. Assocs. 415-467-1434
CO Denver, Mountain Reps. 303-623-0972
FL Valrico, UniRep, Inc. 813-681-3477
GA Roswell, Henry W. Phillips Co., Inc. 404-992-3070
IL Cary, Bob Burns & Assocs., Inc. 708-516-3322
IN New Madison, Reptronics 513-996-0730
MD Baltimore, TAD Elctrn. Sls. 301-727-6651
MA Milford, Jonel Sls. Assocs. 508-478-4650
MI Royal Oak, Hilltronics, Inc. 313-435-0920
MO Raytown, Marty Tarkski Sls. Co. 816-358-1442
NJ Livingston, Applied Process Instrs., Inc. 201-994-9331
NY Grand Island, L. J. McTaggart Assocs. 716-773-9222
OR Portland, Caruso & Co. 503-692-0139
PA Philadelphia, Instrmn. Specialties 215-742-0898
TX Dallas, S.W. Mktg. Assoc. 214-341-8631
Can Crescent West, B.C., H.W. Cowan Canada Ltd. 604-576-8230

Local Distributors

AL Birmingham, Forbes Distrs. 205-251-4104
CA Canoga Pk, Rag Elctrns., Inc. 818-998-6500
CA El Monte, Marshall Claude Michael ... 818-459-5500
AZ Tempe, CMI/Metermaster 602-431-0880
FL Orlando, Emsco/Hammond 305-849-6060
IL Chicago, Newark Elctrns. 312-784-5100
IL Niles, Joseph Elctrns. 312-297-4200
IN Indianapolis, Meunier Elctrn. Supp. 317-635-3511
MA Needham, You-Do-It Elctrns. 617-449-1005
MI Saginaw, Shand Elctrns. 517-799-2527
MN St. Louis Pk, Edtronics Co. 612-938-7541
MO Kansas City, Electronic Supp. 816-931-0250
NJ Moorestown, Marlac 609-234-4200
NY Lindenhurst, RNJ Elctrns. Inc. 516-226-2700
NY New York, Omnitron Elctrns. 212-865-4900
NY Plainsview, Kelvin Elctrns. 516-349-7620
NY Rochester, Transcat 716-458-4801
NC Raleigh, Southeastern Elctrns. 919-828-2311
OH Dayton, Consolidated Elctrns. 513-252-5662
OH Mansfield, Brodhead-Garrett 419-589-8222
PA Drexel Hill, Kass Elctrns. 215-789-7700
TX Ft. Worth, Allied Elctrns. 817-336-5401
MD Silver Springs, Print Products 301-622-1118
WI Milwaukee, E-M Instrs. 414-272-7799

KAUT & BUX MANUFACTURING CO., 675 Tower Rd., P.O. Box 867, Mundelein, IL 60060, Tel: 312-949-8505, TELEX: 6871289 KBM UN/, FAX: 1-312-949-4250; *Sls. Mgr.:* Heinz Kutschera

KAVLICO CORP., 14501 Los Angeles Ave., Moorpark, CA 93021, Tel: 805-523-2000, TELEX: 65-1481, FAX: 805-523-7125; Empl.: 500; *Dist. Mgr.:* Drew Distin

KAYCEE INDUSTRIES LTD., 32 Ramjibhai Kamani Rd, B.E., Bombay-38, INDIA, Tel: 263521/22/23, TELEX: 011 73896; Empl.: 400

KAY ELEMETRICS CORP., 12 Maple Ave., Pine Brook, NJ 07058-9798, Tel: 201-227-2000, TWX: 710-734-4347; FSC No.: 80138; Empl.: 60; *Sls. Mgr.:* Stephen P. Crump ..... **A•1785**

KAY-TOWNES, Div. of Alco Industries, Inc., P.O. Box 593, Rome, GA 30161, Tel: 404-291-9871, TWX: 810-764-4809; Empl.: 60; *Sls. Mgr.:* Charles S. Ford

KB ELECTRONICS, 73 Wortman Ave., Brooklyn, NY 11207, Tel: 718-257-3300, TWX: 710-584-2308, FAX: 718-257-4740; Empl.: 125; *Sls. Mgr.:* A Bueller

KD COMPONENTS, INC., 2710 S. Main St, Santa Ana, CA 92707, Tel: 714-545-7108, TWX: 910-595-2678, FAX: 714-549-7966; FSC No.: 58421; Empl.: 32; *Sls. Mgr.:* Wayne Devine

KDI/TRIANGLE ELECTRONICS, 60 S. Jefferson Rd., Whippany, NJ 07981, Tel: 201-887-5700, TWX: 710-986-8220; FSC No.: 64537; Empl.: 300

KEDMAN CO., Box 25667, Salt Lake City, UT 84125, Tel: 801-973-9112, FAX: 801-972-2756; Empl.: 100

KEITHLEY INSTRS., 28775 Aurora Rd., Cleveland, OH 44139, Tel: 216-248-0400, FAX: 216-248-6148; Empl.: 461; *Sls. Mgr.:* Mike Sciulli

KEL AM, See Teltec, Inc.

KELLY AMERICAN, INC., 640 Federal Rd, Brookfield, CT 06804, Tel: 203-775-2590, TELEX: 4750159ELECABUL, FAX: 203-775-9048; *Sls. Mgr.:* Robert Buckley

KELMET, INC., 569 W. Covina Blvd., San Dimas, CA 91773, Tel: 714-599-0954, FAX: 714-599-2835; Empl.: 6; *Sls. Mgr.:* Paul Hodge

KELTEC FLORIDA, INC., MICROWAVE PRO, Amstar Electronics Group, P.O. Box 2917, Ft. Walton Bch., FL 32549-2917, Tel: 904-244-0043, TWX: 510-730-7654, FAX: 904-243-0103; FSC No.: 09062; Empl.: 625; *Sls. Mgr.:* I. Rampurawala ..... **D•1444**

Local Sales Offices & Reps

FL Huntsville, Beacon Elctrns. Assocs. ... 205-881-1136
AZ Phoenix, J. Smith Assoc. 602-267-0981
CA Mtn. View, Disman Bakner 415-969-3010
CA Orange, Cain Technology 714-997-7311
CA Sacramento, Disman Bakner 916-483-2664
CA Van Nuys, Cain Technology 818-904-9392
CO Englewood, Cain Tech 303-220-8118
GA Atlanta, Beacon Elctrns. Assocs. 404-256-9640
IL Schaumburg, Engrg. Prods. Assocs. ... 312-882-7640
IN Cicero, Engrg. Prods. Assocs. 317-984-5226
IN Indianapolis, Engrg. Prods. Assocs. ... 317-352-0605
KS Lenexa, Dytec/South 913-888-0215
MD Ellicott City, VPI 301-461-2525
MA Lexington, O'Sullivan & Murphy 617-862-6570
MA Needham Hgts., O'Sullivan & Murphy 617-749-8680/1
MN Edina, Engrg. Prods. Assocs. 612-835-9022
MN Minneapolis, Engrg. Prods. Assocs. ... 612-835-9022
MO Maryland Hgts., Dytec/South 314-739-0665
NJ Westfield, Metro-M.I.C.S. 201-233-6116
NM Albuquerque, J. Smith Assoc. 505-265-3406
NY Hauppauge, Metro MICS 516-361-6134
NY Syracuse, Em-Tech 315-437-6410
OK Tulsa, Beacon Elctrns. Assocs. 918-622-1494
PA Montgomerysville, Rufo Sys. 215-368-8495
PA Montgomeryville, Rufo Sys. 215-368-8495
TX Austin, Beacon Elctrns. Assocs. 512-345-3543
TX Dallas, Beacon Elctrns. Assocs. 214-437-1505
VA Sterling, Beacon Elctrns. Worth 703-478-2480
WA Seattle, J.J. Elctrns. Assocs. Inc. 206-246-6619

KELTLON CORP., Viking Modules Div., 225 Crescent St, Waltham, MA 02154, Tel: 617-894-8700, FAX: 617-899-9602; Empl.: 75; *Sls. Mgr.:* T. Chadurjian

KELTRON CORPORATION

FAX: 617-899-9602

KELTRON CORP., High Voltage Power Supply Div., 225 Crescent St, Waltham, MA 02154, Tel: 617-894-8700, TELEX: 948197; Empl.: 170; *Sls. Mgr.:* T. Chadurjian ..... **D•1308**

Local Sales Offices & Reps

GA Roswell, Electro Comp. S.L.S. 404-992-2344
IL Park Ridge, Probe Elec. 312-696-2828
MA Hingham, Shain Assoc. 617-740-2334
MN Edina, J. H. Hanson Co. 612-893-9960
NH Nashua, Shain Assoc. 603-881-4881
NY Commack, R.C. Engrg. 516-543-3325
PA Glenside, Koebert Assoc. 215-887-2310

KELTRON CORP., Miniprinters Div., 225 Crescent St, Waltham, MA 02154, Tel: 617-894-8700, TELEX: 948197, FAX: 617-899-9602; FSC No.: 18662; Empl.: 250; *Sls. Mgr.:* Steven P. Sargent

KELVIN INDUSTRIES, INC., 14724 Ventura Blvd., No. 1003, Sherman Oaks, CA 91403-3501, Tel: 818-990-1192, FAX: 818-995-6460; FSC No.: 19587; Empl.: 180; *Sls. Mgr.:* R. A. Featherston ..... **A•1964-1965**

Local Sales Offices & Reps

AZ Phoenix, Sunwest Mktg. 602-893-7677
CA San Diego, Wes-K Assoc. 619-695-2040
CA San Jose, Tech Sls. 408-954-0400
CA Sherman Oaks, Wes-K Assocs. 818-990-1302
FL Lighthouse Point, R. C. Simon & Co. .. 305-941-2757
IL Deerfield, Walt Krueger 312-945-3720
MA Needham Hgts., Todino Engrg. 617-444-7925
MI Birmingham, Forand Sls. 313-644-0087
MN Minneapolis, Furber Sls. 612-881-3620
MO St. Louis, Abrams & Assocs. 314-569-0447
NY Great Neck, Trionic 516-466-2300
NY Rochester, Foster & Wager 716-385-7744
NC Burlington, P. J. Nahser 919-226-8053
OH New Lebanon, J. N. Bailey & Assocs. 513-687-1325
OK Tulsa, John B. Guenther 918-660-5126
PA Hatboro, J.S. Wurts Co. 215-674-3562
TX Dallas, John B. Guenther 214-691-8500
WA Redmond, Frank Jackson 206-881-7277

Local Distributors

AZ Phoenix, TTI, Inc. 602-861-0222
CA Anaheim, Zeus 714-632-6880
CA Chatsworth, Petell/Passive Comps. ... 818-341-1745
CA Chatsworth, TTI 818-709-1010
CA No. Hollywood, TTI, Inc. 818-709-1010
CA San Diego, TTI, Inc. 619-587-4888
CA San Jose, TTI, Inc. 408-946-5577
CA San Jose, Zeus 408-998-5121
CO Westminster, TTI 303-429-6806
CT Stratford, Electro Comp. 203-375-1400
FL Ft. Lauderdale, NRC 305-772-4500
FL Orlando, TTI, Inc. 305-859-1000
GA Norcross, TTI, Inc. 404-662-0911
ID Spirit Lake, A-I Elctrns 802-635-1545
MD Columbia, TTI 301-995-1331
MA Woburn, TTI, Inc. 617-938-8800
MN Eden Prairie, TTI 612-944-5080
NY Farmingdale, Command Elec. 516-293-1212
NY Ronkonkoma, TTI, Inc. 516-737-2000
OH Dayton, Wright Source 513-293-1341
PA York, ECI 717-843-8971
TX Ft. Worth, TTI, Inc. 817-831-8300
TX Richardson, Zeus 214-783-7010
WA Tacoma, C & G Elec. 206-272-3181

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FAX: 803-963-6521

KEMET ELECTRONICS CORPORATION, Box 5928, Greenville, SC 29606, Tel: 803-963-6621, TELEX: 57-0496, TWX: 810-287-2536; FSC No.: 31433; Empl.: 6,200; *Sls. Mgr.:* Robert Taylor; *Dist. Mgr.:* Dan Manly ..... **A•1096-1097**

Refer to Kemet, Union Carbide Corp., Elctrns. Div. for sales office information and for distributor listings.

Local Sales Offices & Reps

AL Huntsville 205-830-1090
AZ Tempe 602-831-2151
CA Encino 818-609-7561
CA Newport Beach 714-640-9320
CA Santa Clara 408-986-0424
CO Englewood 303-790-0494
FL Ft. Lauderdale 305-731-2187
FL Orlando 407-855-8886
GA Norcross 404-441-7701
IL Schaumburg 312-517-1030
IN Carmel 317-844-7756
MD Columbia 301-992-5600
MA Stoneham 617-279-0400
MI Farmington Hills 313-489-5850
MN Edina 612-929-4642
NY Elmsford 914-347-4390
NY Liverpool 315-451-0720
NC Raleigh 919-872-2877
OH Columbus 614-885-3330
OK Tulsa 918-664-8592
PA Exton 215-363-8310
SC Greenville 803-242-5789
TX Austin 512-458-3181
TX Irving 214-556-0009
WA Kirkland 206-828-4853

KEMTRON CIRCUITS & ELCTRNS. CORP., 110 S. Long Bch. Rd., Rockville Centre, NY 11570, Tel: 516-766-2772; Empl.: 7; *Sls. Mgr.:* Walter Carlock

M.S. KENNEDY CORP., Sub of Hybrilonics, Inc., 8170 Thompson Rd., Clay, NY 13041, Tel: 315-699-9201, FAX: 315-699-8023; FSC No.: 51651; Empl.: 41; *Sls. Mgr.:* Greg Overend

KENTRON, INC., P.O. Box 142, Cedarburg, WI 53012-0142, Tel: 414-377-3733; *Sls. Mgr.:* Kenneth L. Krolski

KEN-TRON MFG., INC., 1204 Industrial Dr., Owensboro, KY 42301, Tel: 502-684-0431, TELEX: 20-4305, FAX: 502-684-0435; Empl.: 100; *Sls. Mgr.:* J. Douglas

KEPCO, INC., 131-38 Sanford Ave., Flushing, NY 11352, Tel: 718-461-7000, TWX: 710-582-2631, FAX: 718-767-1102; Empl.: 300; *Sls. Mgr.:* Paul Birman; *Dist. Mgr.:* Paul Birman ..... **D•1851-1885**

Local Sales Offices & Reps

AL	Huntsville, W. A. Brown, Inc.	205-830-9224
AZ	Phoenix, Aztec Entprs.	602-944-9185
CA	Los Alamitos, Reed Elctrn. Mktg.	213-598-6676
CA	San Diego, Earle Assocs., Inc.	619-278-5441
CA	Sunnyvale, N-S Westronics	408-745-1102
CO	Denver, Aztec Entprs.	303-779-5285
CT	Bethel, Ray Perron & Co., Inc.	203-798-0261
CT	Farmington, R. Perron Co.	203-673-4825
DC	Washington, Eastern Instrmn. Corp.	301-384-8500
FL	Ft. Lauderdale, W. A. Brown Instrs., Inc.	305-776-4055
FL	Melbourne, W. A. Brown Instrs., Inc.	407-723-0776
FL	Orlando, W. A. Brown Instrs., Inc.	407-648-9660
GA	Atlanta, W. A. Brown Instrs., Inc.	404-449-7160
KS	Kansas City, ATECH, Div. of ATA, Inc.	913-268-9644
MD	Baltimore, Eastern Instrmn. Corp.	301-792-7039
MA	Boston, R. Perron Co.	617-449-6162
MI	Detroit, Carter McCormic & Peirce	313-477-7700
MN	S. St. Paul, Northport Engrg.	612-457-8000
MO	St. Louis, ATECH, Div. of ATA, Inc.	314-576-2884
NH	Merrimack, Ray Perron & Co., Inc.	603-424-4423
NJ	Woodcliff Lake, Eastern Instrmn.	201-664-0907
NM	Albuquerque, Techn. Mktg. Assoc.	505-345-8921
NY	Liverpool, NTS Assocs., Inc.	315-451-1091
NC	Cary, W. A. Brown Instrs., Inc.	919-460-1120
OH	Cleveland, Carter McCormic & Peirce	216-826-0400
OH	Dayton, Carter McCormic & Peirce	513-836-0951
OK	Tulsa, Airep Elctrns.	918-494-7711
OR	Beaverton, H. Levinson Co.	503-690-1312
PA	Philadelphia, Eastern Instrmn.	215-355-7700
PA	Pittsburgh, Carter McCormic & Peirce	412-826-3800
TX	Austin, Airep Elctrns.	512-327-0778
TX	Dallas, Airep Elctrns.	214-349-4360
TX	Houston, Airep Elctrns.	713-944-8171
UT	Ogden, Aztec Entprs., Inc.	801-621-1655, 801-355-9256
WA	Seattle, H. Levinson Co.	206-382-1300
WI	Milwaukee, Star Engineering	414-645-3680
Can	Calgary, Alberta, Digidyne, Inc.	403-262-7744
Can	Montreal, DigiDyne Inc.	514-631-1891
Can	Ottowa, Ont., Digidyne, Inc.	613-727-5632
Can	Rexdale, Ont., Digidyne, Inc.	416-674-0444
Can	Vancouver, B.C., Digidyne, Inc.	604-738-0114

KEPRO CIRCUIT SYSTEMS, 630 Axminister Dr., Fenton, MO 63026, Tel: 314-343-1630; Empl.: 17; *Sls. Mgr.:* Jeff R. Keil; *Dist. Mgr.:* Jeff R. Keil

KEPTEL/ARMIGER, 56 Park Rd., Tinton Falls, NJ 07724, Tel: 800-526-3697, 201-389-8800; Empl.: 300; *Sls. Mgr.:* Kathy Plesnarski; *Dist. Mgr.:* Larry Bucknell

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Local Sales Offices & Reps

AL	Brimingham, Bryco	205-672-9760
CA	Costa Mesa, FLW	714-751-7512
CA	Hayward, FLW	415-786-9070
CA	San Diego, FLW	619-277-0993
IN	Indianapolis, Ronald Ray & Assoc.	317-841-9144
MA	Salem, CDM Assocs.	617-741-3166
MI	Southfield, Bill Coombe Sls. Co.	313-355-1511
NJ	Stanhope, Nota-Tek	201-347-1490
NC	Kernersville, Heritage Elctrl. Sls. Assocs.	919-996-4374
OH	Chagrin Falls, RPM Indl. Sls.	216-247-3295
TX	Dallas, Devices, Inc.	214-991-1202
WI	Oconomowoc, Atlas Instr.	414-367-8759

Local Distributors

AZ	Tempe, CMI	602-431-0015
CA	Costa Mesa, FIW	714-751-7512
CA	Dublin, Standard Meter Lab	415-828-4837
CA	Los Angeles, E.I.L. Instrs.	213-685-7020
CT	Middletown, E.I.L. Instrs.	203-346-6646
FL	Bartow, Chemco Elec. Supp.	813-533-3165
FL	Lakeland, AMJ Equipment	813-646-1487
FL	St. Petersburg, Chemco Elec. Supp.	813-577-7774
FL	Tampa, Chemco Elec. Supp.	813-621-8611
GA	Norcross, A A Elec.	404-449-8670
HI	Honolulu, Process Valve & Control	808-834-7675
IL	La Salle, Complete Indl. Entprs.	815-224-1485
IN	Indianapolis, Farrell Argast	317-546-4041
IA	Cedar Rapids, Crescent Electric	319-363-8191
IA	Cedar Rapids, Hupp Elec. Motors	319-366-0761
IA	Davenport, Hupp Elec. Motors	319-322-3168
LA	W. Monroe, Weaks Supp. Co.	318-323-8831
ME	Bangor, Holmes Distrs.	207-942-7357
ME	Portland, Holmes Distrs.	207-774-5901
MD	Sparks, E.I.L. Instrs.	301-771-4800
MA	Burlington, E.I.L. Instrs.	617-272-9450
MA	W. Springfield, Control Engrg.	413-781-1330
MA	Wilmington, Stan. Elec. Supp.	617-658-5050
MI	Ann Arbor, Madison Elec.	313-665-6131
MI	Ann Arbor, McNaughton & McKay	313-995-9515
MI	Jackson, Madsion Elec.	517-783-2735
MI	Kalamazoo, Madison Elec.	616-342-1965
MI	Madison Hgts., McNaughton & McKay	313-399-7500
MO	Maryland Hgts., French Gerleman Elec.	314-569-3122
MO	St. Louis, ISL	314-535-5760
NH	Manchester, Holmes Distrs.	603-669-5060
NJ	Cinnaminson, IMS Distribution	609-662-1770
NJ	Green Brook, Apparatus Elctrl. Supp.	201-752-8400
NY	Clarence, Trott Elctrns.	716-634-8500
NY	Elmira, Brady Supp.	607-733-6591
NY	Pittsford, Trott Elctrns.	716-586-8251
NY	Rochester, Niagara Electric	716-271-1223
NC	Charlotte, Count, Inc.	800-832-0422
NC	Charlotte, Trott Elctrns.	704-376-2237
OH	Cleveland, Pioneer Stan.	216-587-3600
OH	Solon, Pioneer Dayton	513-236-9900
OH	Toledo, Girkins Elec.	419-478-5600
OK	Oklahoma City, Tek Rep	405-947-8088
OR	Portland, Westcon, Inc.	503-283-0132
PA	Carnegie, Flow Media, Inc.	412-276-8055
PA	Newtown Square, QDI	215-359-1000
SC	Spartanburg, Roberts Electric	803-574-9350
TN	Nashville, A A Elec.	615-832-6632
TX	Houston, Texas Technical	713-526-0656
UT	Salt Lake City, Stuart Electric	801-466-8603
VA	Ashland, Hanover Controls	804-798-2007
WA	Kent, CB Parsons	206-882-3222
WI	Oconomowoc, Atlas Instrs.	414-367-8759

KESTER

FAX: 312-390-9338

KESTER SOLDER DIV., Litton Sys., Inc., 515 E. Touhy Ave, Des Plaines, IL 60018, Tel: 312-297-1600, TWX: 910-221-2100; Empl.: 350; *Sls. Mgr.:* Robert J.Murphy; *Dist. Mgr.:* Carl Voelkel ..... **C•1750**

Local Sales Offices & Reps

CA	Anaheim	714-871-0280
NJ	Newark	201-589-0246

KETEMA/RODAN DIVISION, 2900 Blue Star St., Anaheim, CA 92806, Tel: 714-630-0081, TWX: 910-591-1684, FAX: 714-630-4131; FSC No.: 15454;DESC-EQP-75-1387; Empl.: 170; *Sls. Mgr.:* J.F. Catrambone ..... **B•1898-1900**

Local Sales Offices & Reps

AL	Huntsville, Alpha Mktg.	205-533-0766
AZ	Phoenix, TC Elctrn. Sls., Inc.	602-994-5153
AZ	Scottsdale, TC Elctrn. Sls., Inc.	602-994-5153
CA	Los Angeles, Landa & Assocs., Inc.	213-879-0770
CA	San Jose, Arnold Tech. Sls.	408-954-0400
CO	Westminster, Straube Assocs.	303-426-0890
FL	Coral Springs, H.A., Inc.	305-752-7520
IL	Downers Grove, Richmar Elctrns.	312-968-0118
IN	Ft. Wayne, Menze Sls. Co.	219-747-5616
KS	Parker, S. W. Assocs., Inc.	913-898-6552
MA	Framingham, Marathon Sls. Ltd.	508-875-3566
MN	Mendota Hgts., G-II Sls.	612-454-3086
MO	St. Louis, Abrams & Assocs.	314-569-0447
NJ	Bellmawr, TAI Corp.	609-933-2600
NY	Melville, Comtronic Assocs.	516-249-0505
NY	Syracuse, Canavan-Scanlon Assocs.	315-437-1271
NC	Charlotte, Arthur, Harris Assocs.	704-542-9338
TX	Plano, Richmar Elctrns. Corp.	214-424-8388
TX	Round Rock, Richmar Elctrns. Corp.	512-255-2551
UT	Salt Lake City, Straube Assocs.	801-263-2640
WA	Vancouver, R. Over Sls.	206-695-6179

Local Distributors

AZ	Tempe, Elctrn. Supp.	602-276-1199
CA	Los Alamitos, Permag Pacific Corp.	213-594-6515
CA	Riverside, Elctrn. Supp.	714-543-9214
CA	San Diego, Elctrn. Supp.	619-693-8222
CA	Sunnyvale, Permag Sierra	408-738-1080
CO	Denver, Permag Corp.	303-693-6612
GA	Norcross, Permag S.E. Div.	404-448-4998
IL	Elk Grove Vl, Permag Cen. Div.	312-956-1140
MA	Billerica, Permag N.E. Div.	617-663-7500
MN	Eden Prairie, Permag Minnesota Div.	612-934-4635
NY	Hauppauge, Fairmont Elctrns.	516-231-3313
NY	Hicksville, Permag Atlantic Div.	516-822-3311
OH	Toledo, Permag Magnetics Div.	419-385-4621
TX	Richardson, Permag S.W. Div.	214-699-1121
WA	Bellevue, Permag N.W. Div.	206-882-2507
Can	Mississauga, Ont., R-Theta, Inc.	416-890-0221

KEWAUNEE SCIENTIFIC CORP., Technical Workstation Div., 901 FM 20, P.O. Box 930, Lockhart, TX 78644, Tel: 512-398-5292, TELEX: 752706, FAX: 512-398-5104; Empl.: 165 (This Location) 800 (Company Wide); *Sls. Mgr.:* Frank Johnson, Dir. Sls./Mktg.

Keystone CARBON COMPANY

FAX: 814-781-7648

KEYSTONE CARBON, Thermistor Div., 1935 State Street, St. Marys, PA 15857, Tel: 814-781-1591, TELEX: 91-4517; FSC No.: 75-263; Empl.: 1200; *Sls. Mgr.:* John A. Brock; *Dist. Mgr.:* John A. Brock ..... **B•1901-1903**

Local Sales Offices & Reps

CA	Orange, El Dorado Sls.	714-538-7252
CA	Redwood City, Hickey Inds. Sls.	415-594-9978
CA	San Diego, El Dorado Sls.	619-549-2202
CT	Wethersfield, L.J. Labant	203-529-0048
GA	Marietta, J.J. Arnold	404-427-1062
IL	Palatine, David J. Brock	312-359-0955
IN	Fort Wayne, R.O. Whitesell & Assocs.	219-432-5591
IN	Indianapolis, R.O. Whitesell & Assocs.	317-359-9283
IN	Kokomo, R.O. Whitesell & Assocs.	317-457-9127
KS	Shawnee, Benson Engrg.	913-491-4446
MI	Farmington Hills, J.L. Montgomery Assocs.	313-489-0099
MN	Minneapolis, Dave Marrone	612-566-6573
MO	St. Louis, Frank H. Ring	314-863-2511
NY	Rochester, Foster & Wager	716-385-7744
OH	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290
OH	Cleveland, R.O. Whitesell & Assocs.	216-447-9020
OH	Columbus, R.O. Whitesell & Assocs.	614-888-9396
OH	Dayton, R.O. Whitesell & Assocs.	513-298-9546
NC	Cary, J. E. Shea	919-481-2475
PA	Pittsburgh, R.O. Whitesell & Assocs.	412-963-6161
TX	Dallas, Benson Engrg.	214-352-7541
TX	Houston, Benson Engrg.	713-672-2194
EXP	NY, Inwood, Minthorne Int'l.	516-239-0767
Can	Burlington, Ont., Donald J. Hyslop	416-333-3520

Local Distributors

AZ	Scottsdale, Allied Elctrns.	602-990-9549
CA	Garden Grove, Allied Elctrns.	714-554-0731
CA	Inglewood, Newark Elctrns.	213-671-7066
CA	Redwood City, Hi-Cor	415-368-5087
CA	Santa Clara, Allied Elctrns.	408-727-1690
CO	Wheatridge, Allied Elctrns.	303-425-7144

FL	Ft. Lauderdale, Allied Elctrns.	305-486-0500
GA	Atlanta, Allied Elctrns.	404-237-3366
IL	Chicago, Newark Elctrns.	312-638-4411
IL	Elgin, Allied Elctrns.	312-697-8200
MA	Wilmington, Allied Elctrns.	617-942-0150
MI	Westland, Allied Elctrns.	313-595-6565
MN	Minneapolis, Allied Elctrns.	612-559-9545
MN	Thief River Falls, Digi-Key Corp.	1-800-344-4539
MO	St. Louis, Allied Elctrns.	314-878-1229
NJ		
NJ	Frenchtown, Sintec	201-996-4093
NJ	Springfield, Newark Elctrns.	201-376-9500
NY	Mineola, Allied Elctrns.	516-248-2360
NC	Cary, Allied Elctrns.	919-467-0720
OH	Willoughby, Allied Elctrns.	216-951-0908
OK	Tulsa, Allied Elctrns.	918-663-7630
PA	Bala Cynwyd, Allied Elctrns.	215-667-6940
TX	Ft. Worth, Allied Elctrns.	817-336-5401
TX	Ft. Worth, Allied Elctrns.	1-800-228-6705
TX	Houston, Allied Elctrns.	713-445-7123
VA	Alexandria, Allied Elctrns.	703-836-5002
WA	Seattle, Allied Elctrns.	206-767-5772
WI	Milwaukee, Allied Elctrns.	414-463-2662

KEYSTONE ELECTRONICS CORP., 31-07 20th Rd., Astoria, NY 11105-2017, Tel: 718-956-8900, TELEX: 35-3700, FAX: 718-956-9040; FSC No.: 91833; Empl.: 80; *Sls. Mgr.:* Charles Gold

KEYTEK INSTRUMENT CORP., 260 Fordham Rd., Wilmington, MA 01887, Tel: 508-658-0880, TELEX: 951389 KEYTEK BURL, FAX: 508-657-4803; *Sls. Mgr.:* Michael Hopkins

KEYTEK KEYBOARDS CANADA INC., 16 Mary St., Units 3 & 4, Aurora, Ontario, Canada L4G 3W8, Tel: 416-727-9491, FAX: 416-727-7118; Empl.: 20

kgs

FAX: 818-798-1466

KGS ELECTRONICS, INC., 2029 N. Lincoln Ave., Pasadena, CA 91103, Tel: 818-798-0786; Empl.: 50 ..... **D•2206-2207**

Local Sales Offices & Reps

TX	Hurst, McGarrah & Assocs.	817-268-3557

WALTER KIDDE, P.O. Box 1147, Wake Forest, NC 27587, Tel: 919-556-6811, TELEX: 802569 WALTKIDDE, FAX: 919-556-7766; Empl.: 250; *Sls. Mgr.:* Andy Halasz

K.I. INDUSTRIES INC., P. O. Box 166, Elmhurst, IL 60126, Tel: 312-449-1990, TELEX: 721498; Empl.: 30; *Sls. Mgr.:* Henry W. Faller

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Local Sales Offices & Reps

AL	Huntsville, Morard & Co.(MOCO)	205-881-5968
AZ	Chandler, Vic Myers Assocs.	602-241-9324
CA	Carson, Amasco South	213-516-8561
CA	Sunnyvale, Amasco North	408-733-8690
CO	Aurora, R & R Instrmn.	303-340-8728
CT	Madison, Eastronix, Inc.	203-421-4514
FL	Melbourne, EMS, Inc.	305-724-1027
FL	Plantation, EMS, Inc.	305-587-7146
FL	Sarasota, EMS, Inc.	813-923-2804
HI	Honolulu, Honolulu Elctrns.	808-949-5564
IL	Elmhurst, Sector Engrg. Sls.	312-530-7850
IN	Indianapolis, Sector Engrg. Sls.	317-842-1120
KS	DeSoto, Midtec Assocs.	913-441-6565
MD	Wheaton, Brimberg Sls. (Power Supp.)	301-946-2670
MA	Bedford, Eastronix	617-275-5775
MI	Plymouth, EQS Sys., Inc.	313-455-7920
MN	Minneapolis, Sector Engrg. Sls.	612-593-1809
MO	St. Louis, Midtech Assocs.	314-275-8666
NJ	Teaneck, Scientific Dvcs. East	201-837-1035
NM	Albuquerque, Vic Myers Assocs., Inc.	505-884-6878
NY	Rochester, EIC Elctrns.	716-544-4392
OH	Chesterland, EQS Sys., Inc.	216-729-2222
OH	Dayton, EQS Sys., Inc.	513-236-7676
OK	Parkhill, Scientific Dvcs.-S.W.	918-457-4888
OR	Portland, Syntek, Inc.	503-636-6793
PA	Pittsburgh, EQS Sys., Inc.	412-261-2604
PA	Springhouse, Scientific Dvcs. East	215-643-3335
TX	Austin, Scientific Dvcs. SW	512-442-6215
TX	Houston, Scientific Dvcs. SW	713-864-1711
TX	Richardson, Scientific Dvcs. SW	214-231-8106
UT	Salt Lake City, Intermountain Instrs.	801-487-3151
VT	Shelburne, Eastronix	802-985-3743
WA	Kirkland, Syntek, Inc.	206-488-0394
WI	Milwaukee, Sector Engrg. Sls.	414-352-8280
PR	San Juan, David S. Ternent	809-762-2688
Can	Burnaby, BC, Interfax Sys., Inc.	604-430-1410
Can	Mississauga, Ont., Interfax Sys., Inc.	416-671-3920
Can	Nepean, Ont., Interfax Sys., Inc.	613-726-8888
Can	St. Laurent, Que., Interfax Sys., Inc.	514-336-0392

KILO
INTERNATIONAL

FAX: 714-596-8023

KILO INTERNATIONAL, 2118 D Street, La Verne, CA 91750, Tel: 714-593-4626; FSC No.: 05129; Empl.: 50; *Sls. Mgr.:* James T. Davis; *Dist. Mgr.:* James T. Davis ..... **A•2113**

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FAX: 805-684-9679

KILOVAC CORP., Box 4422, Santa Barbara, CA 93140-4422, Tel: 805-684-4560, TWX: 910-336-1141; FSC No.: 18741; Empl.: 103; *Sls. Mgr.:* Patrick McPherson, VP Sls. & Mktg. ..... **B•1552-1557**

Local Sales Offices & Reps

CA	Campbell, Kottmeier Assocs.	408-371-8700
CA	Tarzana, High Voltage Sls.	818-881-9194
GA	Atlanta, Electro Tech	404-262-1522
IL	Elgin, Gassner & Clark, Inc.	312-695-9540
IA	Cedar Rapids, H. R. Brown Sls. Co.	319-366-0635
KS	Olathe, M. E. Bettis Co.	913-764-0621
KS	Wichita, M. E. Bettis Co.	316-265-8250
MD	Columbia, Tyler Griffin Co.	301-995-1215
MN	Osseo, Gaffney Sls.	612-425-5484
MO	St. Louis, Abrams & Assocs.	314-569-0447
NM	Albuquerque, Cleveland Entprs., Inc.	505-265-7893
NY	Great Neck, Trionic Assocs.	516-466-2300
NY	Rochester, Lamb Comp., Inc.	716-323-1250
NY	Syracuse, Lamb Comps., Inc.	315-455-2469
NC	Winston-Salem, DGW, Inc.	919-768-7166
OH	Cleveland, Electronic Components, Inc.	216-331-5330
OH	Columbus, Electronic Comp., Inc.	614-231-2318
OH	Miamisburgh, Electronic Comps., Inc.	513-866-3340
OR	Tigard, Components West, Inc.	503-684-1671
PA	Paoli, Tyler Griffin Co.	215-647-1550
TX	Dallas, Caton Sls. Co.	214-243-4718
WA	Redmond, Components West, Inc.	206-885-5880
Can	Brit. Columbia, Macom Agencies, Ltd.	604-271-2661

KINEMETRICS/SYSTEMS, Kinemetrics, Inc., 222 Vista Ave., Pasadena, CA 91107, Tel: 818-795-2220, TELEX: 67-5402; Empl.: 65; *Sls. Mgr.:* A. M. Sereci

KINEMETRICS/TRUETIME, 3243 Santa Rose Ave, Santa Rosa, CA 95407, Tel: 707-528-1230, TELEX: 176687 (TRUETIME SARO), FAX: 707-527-6640; Empl.: 45; *Sls. Mgr.:* R. J. Dielman

KINETIC SYSTEMS CORP., 11 Maryknoll Dr., Lockport, IL 60441, Tel: 815-838-0005, TWX: 910-638-2831, FAX: 815-838-4424; Empl.: 170; *Sls. Mgr.:* R. H. Brislan

KINGS ELECTRONICS CO., INC., 40 Marbledale Rd, Tuckahoe, NY 10707, Tel: 914-793-5000, TELEX: 6818293 or 6818032; Empl.: 550; *Sls. Mgr.:* Fred Pack; *Dist. Mgr.:* Ed Lagarto/F. Dellaiancano

KIPP & ZONEN, Enraf-Nonius, 390 Central Ave., Bohemia, NY 11716, Tel: 516-589-2885, 800-645-1025, TELEX: 0960250, FAX: 516-589-2068; Empl.: 25; *Sls. Mgr.:* Wm. Novack; *Dist. Mgr.:* Wm. Novack

KISTLER-MORSE, P.O. Box 3009, Redmond, WA 98073, Tel: 206-881-8000, FAX: 206-883-4893; *Sls. Mgr.:* Stan Isenhath

KLC/KARL LAMBRECHT CORP., 4204 N. Lincoln Ave., Chicago, IL 60618, Tel: 312-472-5442, TELEX: 759819, FAX: 312-472-2724; Empl.: 29; *Sls. Mgr.:* Raymond Lambrecht

KLM ELECTRONICS:MIRAGE/KLM, 16890 Church St., P.O. Box 1000, Morgan Hill, CA 95037, Tel: 408-779-7363, FAX: 408-779-8845; Empl.: 250; *Sls. Mgr.:* John J. Concialdi

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KMC SYSTEMS, INC., 140 Greenwood Ave. (Bldg. 3), Midland Pk., NJ 07432, Tel: 201-447-0007; Empl.: 120; *Sls. Mgr.:* E. Verder

Local Sales Offices & Reps

UT	Bountiful, Lectrol, Inc.	801-292-7674
Can	Downsview, Ont., Displayco, Ltd	416-663-6405

KNIGHTFIRE TECHNOLOGY, 2139 University Dr., Ste.211, Coral Springs, FL 33071, Tel: 305-344-3682, FAX: 305-752-4353; FSC No.: FSC 6130; Empl.: 4; *Sls. Mgr.:* Sue Pantelakis

KNOWLEDGEWARE, INC., 3340 Peachtree Rd., N.E., Ste. 1100, Atlanta, GA 30326, Tel: 404-231-8575, TELEX: 544080; FSC No.: 7030-0003; Empl.: 1400; *Sls. Mgr.:* Donald P. Addington

KNOWLES ELECTRONICS, INC., 3100 N. Mannheim Rd., Franklin Park, IL 60131, Tel: 312-455-3600, TWX: 433-0330, FAX: 1-312-455-9203; *Sls. Mgr.:* Reginald G. Garratt, VP-Mktg.

KOA

FAX: 814-362-8883

KOA SPEER ELECTRONICS, Bolivar Dr., P.O. Box 547, Bradford, PA 16701, Tel: 814-362-5536, TELEX: 91-4404, TWX: 510-695-5921; FSC No.: 09021; Empl.: 3000; *Sls. Mgr.:* L. G. Holzwarth; *Dist. Mgr.:* L. Rice ..... **A•1099, 1966-1970**

Local Sales Offices & Reps

AL	Huntsville, Cartwright & Bean	205-830-1540
AZ	Phoenix, Howe & Howe Sls.	602-264-7971
CA		
CA	Garden Grove, ELSCO Elctrns.	714-891-4621
CA	San Diego, Westrep	619-566-6580
CA	Santa Clara, Caltron Comps.	408-980-0181
CO		
CO	Boulder, R. G. Entprs.	303-447-9211
CT	E Hampton, Northeast Representatives	203-866-6030
FL		
FL	Altamonte Springs, APM Assocs.	407-869-6831
FL	Ft. Lauderdale, APM Assocs.	305-978-9941
FL	Tampa, APM Assocs.	813-886-2457
GA	Norcross, Cartwright & Bean	404-368-0160
IL	Arlington Hgts., C. L. Greenslade Sls.	312-593-3450
IN	Fort Wayne, John F. Kilfoil	219-483-6208
AZ	Overland Pk., Spectrum Sls.	913-648-6811
LA	Covington, Cartwright & Bean	504-892-1780
MA	Hingham, Northeast Representatives	617-749-8700
MI	Troy, C. B. Jensen & Assocs.	313-643-0506
MN	Edina, Grayden & Flemmer	612-941-1120
MS	Jackson, Cartwright & Bean	601-981-1170
MO	Hazelwood, Spectrum Sls.	314-731-5151
NH	Milford, Northeast Representatives	603-880-8199
NM	Albuquerque, SynTech	505-266-7951
NY	East Rochester, Tri-Tech Elctrns.	716-385-6500
NY	Endwell, Tri-Tech Elctrns.	607-754-1094
NY	Fayetteville, Tri-Tech Elctrns.	315-446-2881
NY	Fishkill, Tri-Tech Elctrns.	914-897-5611
NY	Great Neck, MOS Assocs.	516-487-3966
NC	Charlotte, Cartwright & Bean	704-536-0303

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OH	Cincinnati, John F. Kilfoil	513-791-6150
OR	Beaverton, Earl & Brown Co.	503-643-5500
PA	Wynnewood, Metz-Benham Assocs.	215-896-7300
TN	Knoxville, Cartwright & Bean	615-693-7450
TN	Memphis, Cartwright & Bean	901-362-8345
TX	Lewisville, Jim Hughes	214-221-1536
WA	Redmond, Earl & Brown Co.	206-885-5064
PR	San German, Digit-Tech Sls.	809-892-4260

Local Distributors

AL	Huntsville, Reptron	205-722-9500
AZ	Ftn. Hill, RCD Inds.	602-483-6412
AZ	Glendale, Camco Elctrn. Comps.	602-269-6201
AZ	Phoenix, Sterling Elctrns.	602-268-2121
AZ	Tempe, Shelley- Ragon	602-894-2058
AZ	Tempe, T.T.I.	602-431-1191
AR	Little Rock, Carlton-Bates	501-562-9100
CA	Laguna Hills, JACO Electronics	714-837-8966
CA	Campbell, Lartronics	408-379-6454
CA	Chatsworth, MIL-Comm Distrs.	818-998-3111
CA	Chatsworth, Shelley-Ragon	818-998-3333
CA	Chatsworth, T.T.I.	818-709-1010
CA	Costa Mesa, Eric Elctrns.	714-751-1185
CA	Fountain Valley, Comps. Ctr.	714-979-0433
CA	Fountain Valley, SMD, Inc.	714-557-4123
CA	Garden Grove, Natl. Elctrns.	714-892-7749
CA	Irvine, KELEX	714-863-1230
CA	Milpitas, T.T.I.	408-946-5577
CA	Orange, Ryno Elctrns.	714-637-0200
CA	San Diego, Ryno Elctrns.	619-453-8430
CA	San Diego, Shelley-Ragon	619-453-7133
CA	San Diego, T.T.I.	619-587-4888
CA	San Jose, Distel	408-432-9290
CA	San Jose, Eric Elctrns.	408-432-1111
CA	San Jose, Shelley Ragon	408-432-0600
CA	Santa Clara, Components Ctr.	408-988-3751
CA	Sunnyvale, SAI	408-745-0800
CA	Westlake Village, Distel	805-495-9998
CO	Boulder, R. G. Entprs.	303-447-9211
CO	Denver, T.T.I.	303-429-6806
CO	Englewood, Shelly-Ragon Elec. Parts	303-762-0670
CT	Stratford, T.T.I.	203-375-1400
CT	Stratford, Utronics	203-378-4201
CT	Wallingford, Midstate Elctrns.	203-265-9900
FL	Orlando, TTI	305-859-1000
FL	Tampa, Reptron Elec.	813-855-4656
FL	Tampa, Shelley-Ragon	813-623-6560
FL	W. Palm Beach, Nurmi Elctrn. Supp.	305-686-8553
GA	Norcross, Reptron	404-446-1300
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IL	Elk Grove Village, GBL/Goold Elctrns.	312-593-3220
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IL	Rosemont, Advent Elctrns.	312-298-4210
IN	Indianapolis, Advent Elctrns.	317-872-4910
IA	Cedar Rapids, Dee Elctrns.	319-365-7551
MD	Baltimore, Radio Elec. Svc. Co.	301-529-0500
MD	Beltsville, Radio Elec. Svc.	301-937-9100
MD	Columbia, Jaco Comps.	301-995-6620
MD	Columbia, T.T.I.	301-995-1331
MA	Billerica, Baldwin Comp. Ctr.	617-667-6710
MA	Norwood, EMTEL Electronics	617-769-9500
MA	Norwood, Gerber Elctrns.	617-769-6000
MA	Wilmington, J.V. Elctrns.	617-657-6523
MA	Wilmington, North Star Elect.	617-657-5155
MA	Wilmington, T.T.I.	617-658-4700
MA	Woburn, Sterling Elec.	617-938-6200
MI	Ann Arbor, Wedemeyer	313-665-8611
MI	Farmington Hills, Advent Elctrns.	313-477-1650
MI	Livonia, Reptron Elctrns.	313-525-2700
MI	St. Clair Shores, SPEMCO	313-771-2700
MN	Eden Prairie, T.T.I.	612-944-5080
MN	Hibbing, Minn Tech Elctrns.	218-262-5228
MN	St. Paul, Shelley-Ragon Elctrns.	612-642-2828
MO	Independence, Shelley-Ragon Elctrns.	816-254-3410
MO	St. Louis, Franklin Elctrns.	314-993-5333
NE	Lincoln, Scott Elctrns.	402-466-8221
NV	Las Vegas, Kiesub Corp.	702-733-3888
NH	Nashua, Brevan Elctrns.	603-889-7230
NJ	Mount Laurel, TTI Inc.	609-234-6400
NJ	Mountainside, Enox Resistor Co.	201-654-7600
NJ	Parsippany, Fabe Electro Sls.	201-299-1123
NM	Albuquerque, Betatron	505-821-1122
NY	Amherst, Standard Elctrns.	716-691-3801
NY	Buffalo, Summit Distrs.	716-887-2845
NY	E. Syracuse, Add Elctrns.	315-437-0300
NY	Hauppauge, Fairmont Elctrn. Sls.	516-231-3313
NY	Hauppauge, Jaco	516-273-5500
NY	Melville, S.A.I.	516-293-2710
NY	Rochester, Summit Distrs.	716-334-8110
NY	Ronkonkoma, Baldwin Comp. Ctr.	516-588-5700
NY	Ronkonkoma, Prime Comps.	516-737-1730
NY	Ronkonkoma, T.T.I.	516-737-2000
NY	Valley Stream, L & S Elctrns.	516-561-2474
NC	Greensboro, Golden Elctrns.	919-294-4653
NC	Raleigh, Southeastern Radio	919-828-2311
OH	Cleveland, Roberts Elect. Corp.	216-238-1711
OH	Columbus, T.T.I.	614-848-5770
OH	Worthington, Reptron	614-436-6675
OK	Tulsa, Altair Co.	918-252-5781
OR	Beaverton, Murphy Elctrns.	503-642-2001
PA	Drexel Hill, Kass Elctrns. Dist.	215-449-2300
PA	Erie, Rem Elctrns.	814-453-5626
PA	Harrisburg, Cumberland Elctrns.	717-233-5883
PA	Philadelphia, PEI/Genesis	215-673-0400
PA	Philadelphia, Shap	215-969-3300
PA	Trevose, Sager Electronics	215-638-7491
RI	Pawtucket, Major Edwards	401-725-7400
TN	Knoxville, Bondurant Bros.	615-573-9151
TX	Dallas, Shelley-Ragon	214-349-2424
TX	ElPaso, ERA Electronics,Inc.	915-855-3600
TX	Ft. Worth, T.T.I.	817-831-8300
TX	Ft. Worth, T.T.I. Inc.	817-831-0441
TX	Houston, Altair Co.	713-462-3029
TX	Richardson, Altair Co.	214-231-5166
TX	Richardson, Jaco	214-235-9575
TX	Richardson, RSC Electronics	214-644-3444
TX	Richardson, SAI	214-231-6330
WA	Redmond, JACO Electronics	206-881-9700
WA	Redmond, Murphy Elctrns.	206-881-1234
WA	Redmond, Shelley-Ragon	206-883-2220
WA	Redmond, T.T.I.	206-882-0291
WI	Oconomowac, G W Elctrns.	414-567-9445
Can	Mississauga, Ont., Prelco	416-678-0401
Can	Montreal, Que., Prelco	514-389-8051

KOEP PRECISION STANDARDS, INC., 121 Helen Street, 2nd Fl., South Plainfield, NJ 07080, Tel: 201-757-2220/2277, TWX: 710-998-0503, FAX: 201-757-2332; FSC No.: 57114; Empl.: 7; *Sls. Mgr.:* Cythnia Koep; *Dist. Mgr.:* N/A ..... **D•1310**

Local Sales Offices & Reps

AZ	Scottsdale, Williams Assocs.	602-947-4297
AZ	Scottsdale, Williams Assocs.	602-947-4287
CA	San Diego, Tech-Ser,Inc.	619-222-1121
CA	Santa Clara, Tech-Ser, Inc.	408-496-1004
CA	Torrance, Cutlas Elctrns.	213-324-7360
CA	Torrence, Cutlas Elec.	213-324-7360
CA	Torrence, Tech-Ser,Inc.	213-370-7200
CO	Commerce City, Williams Assocs.	303-289-5647
GA	Rosswell, T.S.Williams & Assocs.	404-587-3353
IL	Schaumberg, K.W.Meyers Co.	312-882-4608
IN	Indianapolis, K.W.Meyers Co.	317-783-1030
IA	Cedar Rapids, K.W.Meyers Co.	319-363-8987
KS	Lenexa, Midtec Assocs.,Inc.	504-734-8888
LA	Jefferson, Butler & Land Inc.	504-734-8888
MD	Sparks, Black & Assocs.	301-472-2416
MI	Troy, Satullo Assocs.,Inc.	313-585-4811
MN	Minneapolis, K.W.Meyers Co.	612-920-7080
MO	St. Louis, Mid-Tec Assocs. Inc.	314-275-8666
NJ	Elmwood Park, L&M Assocs.	201-797-0441
NM	Albuquerque, MG Electronics, Inc.	505-255-1638
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Farmington, Canavan-Scanlon Assocs. Inc.	716-924-7450
NY	Horsehead, Canavan-Scanlon Assoc.	607-739-0810
NY	NY City, L&M Associates	212-243-6155
NY	Syracuse, Canavan- Scanlon Assoc.	315-437-1271
NC	Charlotte, Baesel & Assocs., Inc.	704-375-1044
TX	Dallas, Butler & Land, Inc.	800-527-6870
TX	Houston, Butler & Land, Inc.	713-896-0808
UT	Salt Lake City, Williams Assocs.	801-532-7701
UT	Salt Lake City, Williams Assocs. Inc.	801-532-7701
VA	Orange, Black & Assocs.	804-794-1315
WA	Seattle, Instruments & Representatives Assocs.	206-575-0707
WI	Milwaukee, K.W.Meyers Co.	414-784-3790

KOLIN INDS., Box 300, Pound Ridge, NY 10576, Tel: 914-764-5775, FAX: 914-764-5386; Empl.: 30; *Sls. Mgr.:* J. Kolinsky

KONTES, Kimble Div. of Owens/IL, 1001 Spruce St., Vineland, NJ 08360, Tel: 609-692-8500, TWX: 510-687-8967

KONTRON ELCTRNS., 630 Clyde Avenue, Mountain View, CA 94039-7230, Tel: 415-965-7020, TWX: 910-378-5207, FAX: 415-965-3505; Empl.: 40; *Sls. Mgr.:* Howard Koel

KOOLTRONIC, INC., Hamilton Ave., Hopewell, NJ 08525, Tel: 609-466-3400, TELEX: 843345, FAX: 609-466-1114; Empl.: 200; *Sls. Mgr.:* John J. Drages

KOOLTRONIC, INC., 1700 Morse Avenue, Ventura, CA 93003, Tel: 805-642-8521, FAX: 805-658-2901; Empl.: 200

KORRY ELECTRONICS CO., Criton Technologies, 901 Dexter Ave. N., Seattle, WA 98109, Tel: 206-281-1300, TWX: 910-444-2295; Empl.: 410; *Sls. Mgr.:* Bob Simpson

KRAFT DYNATRONIX, INC., 105 Power St, Amery, WI 54001, Tel: 715-268-8118, 800-826-7172, FAX: 715-268-8183; Empl.: 25; *Sls. Mgr.:* R. W. Kappler; *Dist. Mgr.:* R. W. Kappler, Natl. Sls. Mgr.

KRECKMAN, HERB, CO., Cresco, PA 18326, Tel: 717-595-2212; Empl.: 4

KR ELECTRONICS, INC., 91 Avenel St, Avenel, NJ 07001, Tel: 201-636-1900, FAX: 201-636-1982; FSC No.: 55259; Empl.: 20; *Sls. Mgr.:* none ..... **A•1704-1705**

Local Sales Offices & Reps

CO	Englewood, Tech. Mktg. Co.	303-770-8994
IL	Elmhurst, Utronix Sls., Inc.	312-834-1100
OH	Kettering, Frank Bold & Assocs.	513-298-6145
TX	Dallas, Kay Todd Assocs.	214-458-8833

KRENZ ELECTRONIC, INC., 940 Calle Amanecer, Ste. P, San Clemente, CA 92672, Tel: 714-361-6866, FAX: 714-361-6867; Empl.: 75; *Sls. Mgr.:* Michael Merget

KRISTEL CORPORATION, 833 Industrial Dr., West Chicago, IL 60185, Tel: 312-293-0850, TELEX: 297 159 KRIS, FAX: 312-293-1255; Empl.: 35; *Sls. Mgr.:* Don Matthiesen

KRL

FAX: 603-624-0634

KRL/BANTRY COMPONENTS, INC., 160 Bouchard St, Manchester, NH 03103, Tel: 603-668-3210; FSC No.: 18235; Empl.: 75; *Sls. Mgr.:* Bert A. Spiller ..... **A•1972-1975**

Local Sales Offices & Reps

AZ	Tempe, Toribre Entprs., Inc.	602-820-5866
CA	Mtn. View, Francisco & Assocs.	415-962-1717
CA	San Diego, Vikmore Elctrns.	619-224-0013
CA	Sepulveda, Gil & Assocs.	818-894-1262
FL	Boca Raton, Sls. Specialists	813-754-1329
IN	Indianapolis, CC Electro Sls.	800-423-7799
NH	Amherst, D. A. Crowley & Assocs.	603-673-7050
NY	Port Washington, Ashtec	516-767-0336
NY	Rochester, H. C. Johnson Agencies	716-586-0777
OH	Akron, Augnat Assocs.	216-273-1211
OK	Tulsa, Milco Mktg.	918-664-2277
PA	Wyndmoor, Precision Mktg. Grp.	215-233-9233
TX	Houston, Milco Mktg.	713-723-5003
TX	Richardson, Milco Mktg.	214-738-2716
UT	Salt Lake City, Sage Assocs.	801-467-5451
WA	Seattle, The Harry Levinson Co.	206-382-1300

Local Distributors

MA	Billerica, Baldwin Comps.	617-667-6710
NJ	Mountainside, ENOX Resistors	201-654-7600
NY	Ronkonkoma, Baldwin Comps. Center	516-588-5700,800-645-5608
PA	Harrisburg, Ad-Tech	717-939-8337

KROHN-HITE CORP., Avon Indl. Pk, Bodwell St, Avon, MA 02322, Tel: 508-580-1660, TWX: 710-345-0831, FAX: 617-583-8989; Empl.: 60; *Sls. Mgr.:* Dick Heitmann ..... **A•1699; D•1311**

Local Sales Offices & Reps

AL	Huntsville, Gentry Assocs.	205-837-0692
AZ	Phoenix, Odyssey 1	602-246-8846
CA	Huntington Bch., Sci-Dev West	714-840-3501
CA	San Jose, MCH Assocs.	408-246-7330
CO	Englewood, Odyssey 1	303-773-8176
FL	Ft. Lauderdale, Gentry Assocs.	305-791-8405
FL	Orlando, Gentry Assocs.	305-859-7450
FL	Tampa, Gentry Assocs.	813-886-0720
GA	Atlanta, Gentry Assocs.	404-998-2828
IL	Chicago, Berndt Assocs.	312-283-0713
IN	Carmel, Berndt Assocs.	317-844-0114
KS	Overland Park, Ramsey Assocs.	913-649-6996
LA	Gretna, Gentry Assocs.	504-367-3975
MD	Baltimore, Sci-Rep	703-385-0600
MI	Detroit, EQS Sys.	313-961-3042
MN	Minneapolis, Berndt Assocs.	612-546-2021
MO	St. Louis, Ramsey Assocs.	314-878-5042
NJ	Englewood, Sci. Devices E.	201-871-3916
NM	Albuquerque, Odyssey 1	505-265-6645
NY	Syracuse, Labtronics	315-455-7314
OH	Chesterland, EQS Sys.	216-729-2222
OH	Columbus, EQS Sys.	614-228-3453
WA	Bellevue, Sci. Dvcs., N.W.	206-747-5189
PA	Pittsburgh, EQS Sys.	216-729-2222
PA	Spring House, Scientific Devices East	215-643-3335
SC	Columbia, Gentry Assocs.	803-772-6786
TN	Knoxville, Gentry Assocs.	615-584-0281
TX	Houston, Barnhill Assocs.	713-444-1733
VA	Fairfax, Sci-Rep	703-385-0600
WA	Bellevue, Sci. Dvcs. N. W.	206-747-5169
WI	Milwaukee, Berndt Assocs.	414-545-8400

KRYSTINEL CORP., 126 Pennsylvania Ave., Paterson, NJ 07509, Tel: 201-345-8900, TWX: 710-988-5931, FAX: 201-345-1172; Empl.: 200; *Sls. Mgr.:* William Perkins ,Mgr.Customer Service

KSI, See Kaiser Systems, Inc.

K-SYSTEMS OF TEXAS, INC., 11501 Rojas Dr. Ste. P, El Paso, TX 79936, Tel: 915-598-9769, TELEX: WUI 6502763972, FAX: 915-593-2080; Empl.: 4; *Sls. Mgr.:* J.C. Kates

K-TRONICS, K. T. Elctrns. Inc., 341 Cobalt Way No. 206, Sunnyvale, CA 94086, Tel: 1-800-888-ELCO, FAX: 408-732-5049; *Sls. Mgr.:* Douglas Hemingway ..... **B•1375; D•1908-1909**

Local Sales Offices & Reps

AZ	Scottsdale, Luscombe Engrg.	602-949-9333
CA	Los Gatos, Luscombe Engrg.	408-370-2020
CO	Longmont, Luscombe Engrg.	303-772-3342
CT	Seymour, Sturdy Corp.	203-888-1480
FL	Orlando, DAI Sls.	407-299-7754
MA	Wellesley Hills, Sturdy Corp.	617-235-2330
OR	Lake Oswego, Luscombe Engrg.	503-636-6664
PA	Paoli, Tyler Griffin	215-647-1550
UT	Midvale, Luscombe Engrg.	801-565-9885
WA	Seattle, Luscombe Engrg.	206-223-1541

K-TWO INDUSTRIES, 4331 Miranda Ave., Palo Alto, CA 94306, Tel: 408-720-9316; Empl.: 5

KULITE SEMICONDUCTOR PRODS., INC., One Willow Tree Rd., Leonia, NJ 07605, Tel: 201-461-0900, TELEX: 685-3296, FAX: 201-461-0990; Empl.: 300

KULKA (DIALIGHT CO.), See Dialight Corp.

KURZ INSTRUMENTS INC., 2411 Garden Rd., Monterey, CA 93940, Tel: 800-424-7356, TELEX: 172275; FSC No.: 94-24-11681; Empl.: 72; *Sls. Mgr.:* Tom Wortman

K-W MANUFACTURING CO., INC., P. O. Box 508, Prague, OK 74864, Tel: 405-567-2285, TELEX: 4932625, FAX: 405-567-4153; Empl.: 60; *Sls. Mgr.:* Freda Pickard

KYCON CABLE & CONNECTOR, INC., 1772 Little Orchard St, San Jose, CA 95125, Tel: 408-295-1110, FAX: 408-295-8054; Empl.: 8; *Dist. Mgr.:* Stephanie Sherman ..... **C•1398-1399, 1867**

Local Sales Offices & Reps

CA	San Jose, Kycon Cable & Connector, Inc.	408-295-1110

Local Distributors

CA	Sunnyvale, PSC Elctrns.	408-737-1333

KYOCERA NORTHWEST, Electronic Components Group, 5701 E. Fourth Plain Blvd, Vancouver, WA 98661, Tel: 206-696-2840, TELEX: 49999 180, FAX: 206-695-5836; Empl.: 800; *Sls. Mgr.:* Koji Kanatani; *Dist. Mgr.:* Phil Elliott, Dist. Sales ..... **A•1100-1101, 1414-1415, 1976-1977**

LAB-LINE INSTRUMENTS, 15th & Bloomingdale, Melrose Park, IL 60160, Tel: 312-450-2600, TELEX: 6871028; Empl.: 225

LAFRANCE CORP., Entprs & Exec Aves, Philadelphia, PA 19153-3893, Tel: 215-365-8000, TELEX: 506-082, FAX: 215-365-4420; Empl.: 502; *Sls. Mgr.:* Brian McHenry

LAFRANCE CORP., PACTEC DIV., See PacTec Div., LaFrance Corp.

LAKE SHORE CRYOTRONICS, INC., 64 E. Walnut St, Westerville, OH 43081, Tel: 614-891-2243, TELEX: 24-5415, FAX: 614-891-1392; *Sls. Mgr.:* David L. Calvelage

LA MARCHE MFG., 106 Bradrock Dr., Des Plaines, IL 60018, Tel: 312-299-1188, TELEX: 28-2526; FSC No.: ;15736; Empl.: 225

LAMBDA ELECTRONICS, Veeco Instr., Inc., 515 Broad Hollow Rd., Melville, NY 11747, Tel: 516-694-4200, TWX: 510-224-6484, FAX: 516-293-0519; Empl.: 1200; *Sls. Mgr.:* I. Gutman

LAMBDA SEMICONDUCTORS, Veeco Instruments, 121 International Dr., Corpus Christi, TX 78410, Tel: 512-289-0403, 800-255-9606, TWX: 910-876-1404, FAX: 512-289-0472; Empl.: 200

LAMB INDUSTRIES, INC., 6585 S.W. Raleighwood La., Portland, OR 97225, Tel: 503-297-8878, TELEX: 263373LAMBUR, FAX: 503-297-8879; Empl.: 5; *Sls. Mgr.:* Gary Rhode; *Dist. Mgr.:* Joanne McIntyre ..... **B•1164, 1780-1781**

Local Sales Offices & Reps

CA	Mt. View, Del Bucchia/Onken	415-965-8043
CO	Broomfield, Conners Co.	303-466-9628
CT	Bloomfield, Zaslow Sls.	203-242-7781
IL	Des Plaines, Lincoln, Hodges	312-297-3810
IN	Ft. Wayne, MS Sls.	219-436-3023
MI	Ferndale, Shalco Inc.	313-547-4771
MO	St. Louis, KKB and Co.	314-647-2400
NH	Portsmouth, Zaslow Sls.	203-242-7781
NJ	Nutley, Falk Baker	201-661-2430
OH	Cleveland, KT/DEPCO	513-777-9399
OR	Portland, Lamb Inds.	503-297-8878
PA	Harrisburg, Beil and Whitaker	717-564-6900
TX	Carrolton, Impaq Sls.	214-247-3300
VA	Martinsville, ENG REPS Assoc.	703-632-2365
VA	Reston, Stinson & Assoc.	703-478-2252
Can	Montreal, Que., Dynatech Electronics	514-643-1702

Local Distributors

CA	San Carlos, Logan Elctrns.	415-594-0700
CA	Tustin, Western Switches	714-259-8144
CA	Van Nuys, EW Elctrns.	714-857-4422
CA	Van Nuys, Wes-Garde/Pacific Switch	213-873-4802
CT	Hartford, Wes-Garde	203-527-7705
FL	Lakeland, Wes-Garde	813-644-7564
MN	Minneapolis, Tor/Tec Corp.	612-866-3662
MN	New Brighton, Parts One	612-633-8079
NY	Freeport, KRP Elctrns.	516-623-3346
OH	Westerville, Wes-Garde	614-885-0319
OR	Portland, Radar Elctrns.	503-232-3404
TX	Austin, Galtronics	512-837-7470
WA	Seattle, Pacific Elctrns.	206-575-1050
WA	Seattle, Radar Elctrns.	206-282-2511
WI	Mequon, Lakeview Elctrns.	414-377-8250

LAMP TECHNOLOGY, INC., 1645 Sycamore Ave., Bohemia, NY 11716, Tel: 516-567-1800, TELEX: 279260; Empl.: 20; *Sls. Mgr.:* Neal Shupak

LAMPTRONIX CO., LTD.

FAX: 815-455-7916

LAMPTRONIX CO., LTD., 81 N. Williams St, Crystal Lake, IL 60014, Tel: 815-455-0400; FSC No.: 61342 ..... **B•1165**

Local Sales Offices & Reps

CA	Westlake Vl., Casco	818-889-7889
WA	Lynnwood, The Nichols Co.	206-742-8761
IL	Crystal Lake, Bussey & Assocs.	815-459-3752
WI	Ripon, Kilgore Assocs.	414-748-7485

LAMTECH ELECTRONICS, 620 Easy Street, Garland, TX 75042, Tel: 214-272-3504, FAX: 214 272 7176; FSC No.: O7R487; Empl.: 100; *Sls. Mgr.:* Phillip Rasor; *Dist. Mgr.:* Phillip Rasor

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LANCER CHEMICAL, 80 Cutter St, Box 30, Warren, RI 02885, Tel: 401-245-5493

LANDIS & GYR, INC., 99 Castleton St, Pleasantville, NY 10570, Tel: 914-747-3540, TELEX: 137345, FAX: 914-592-1179; Empl.: 65; *Sls. Mgr.:* Joe Depaola; *Dist. Mgr.:* R. W. Strohm

LANDIS & GYR, INC., See Maxmar Controls Inc.

L & L SPECIAL FURNACE, 166 Kent Rd., Aston, PA 19014, Tel: 215-459-9216, FAX: 215-459-3689; Empl.: 20; *Sls. Mgr.:* Greg Lewicki; *Dist. Mgr.:* Stephen Lewicki

L & R MFG. CO., 577 Elm St, Kearny, NJ 07032, Tel: 201-991-5330, FAX: 201-991-5870; Empl.: 220; *Sls. Mgr.:* Robert Lasky

LANGLEY:FLEET AEROSPACE, INC., P.O. Box 2911, San Diego, CA 92112, Tel: 619-264-3181; FSC No.: 83549; Empl.: 110; *Sls. Mgr.:* A. Kremm

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LARK ELECTRONICS, INC., Box 390, New York, NY 10040, Tel: 212-569-0430; FSC No.: 52682

LARK ENGINEERING CO., Baier & Baier Inc., 26401 Calle Rolando, San Juan Capistrano, CA 92675, Tel: 714-240-1233, FAX: 714-240-7910; FSC No.: 33174; Empl.: 25

LARSON INSTRUMENT, Greenbush Rd., Orangeburg, NY 10962, Tel: 914-359-3800, FAX: 914-365-1581; Empl.: 18; *Sls. Mgr.:* A. D. Stephens

LASER CONCEPTS, Omega Organization Intl., P.O. Box 33623, Seattle, WA 98133, Tel: 206-364-7881; *Sls. Mgr.:* Roberta Forsythe

LASER DIODE, INC., Morgan Crucible, 1130 Somerset St, New Brunswick, NJ 08901, Tel: 201-249-7000, TWX: 710-998-0597, FAX: 201-249-9165; Empl.: 170; *Sls. Mgr.:* Greg Dougherty; *Dist. Mgr.:* Greg Dougherty

LASER PRECISION CORP., 1231 Hart St., Utica, NY 13502, Tel: 315-797-4449, TELEX: 646803; Empl.: 180; *Sls. Mgr.:* David Stehlin

LASER TECHNOLOGY, INC., 10624 Ventura Blvd., N. Hollywood, CA 91604, Tel: 818-763-7091, TELEX: Cable-LASTEC (No. Hollywood), FAX: 818-763-7382; Empl.: 22; *Sls. Mgr.:* Paul Jensen

LAW, R. E. INSTRUMENT, INC., 7735 W. 112th Pl, Palos Hills, IL 60465, Tel: 312-974-4000; FSC No.: 6685-6695; *Sls. Mgr.:* R. Gene Law; *Dist. Mgr.:* R. Gene Law

L-COM INC., 1755 Osgood St, N. Andover, MA 01845, Tel: 508-682-6936, FAX: 508-689-9484; Empl.: 16; *Sls. Mgr.:* Scott Black ..... **B•1782-1783; D•1313**

LDJ INCORPORATED, 2200 Stephenson Hwy., P.O. Box 219, Troy, MI 48099-0219, Tel: 313-528-2202, TWX: 810-232-1509 LDJ TRMI, FAX: 313-689-2525; Empl.: 63; *Sls. Mgr.:* Jim Ling

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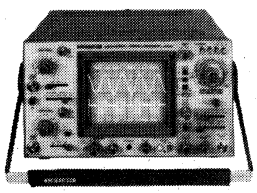

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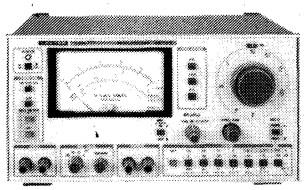

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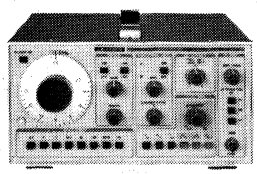

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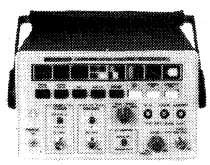

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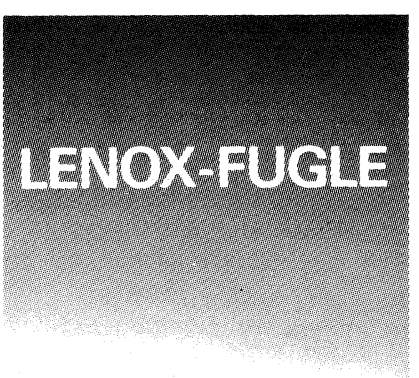

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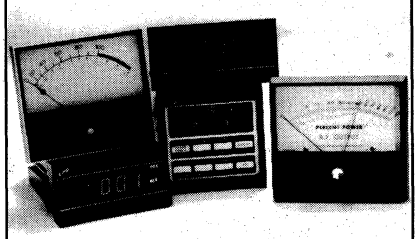

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OH Cleveland, Specialized Comp. Sls. Co., Inc. 216-464-0405
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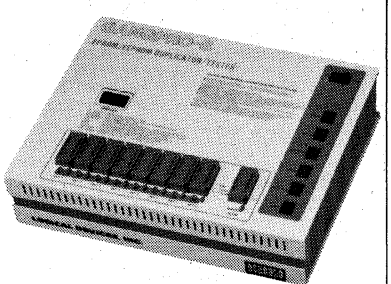

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CA	Thousand Oaks, Craig Assoc.	818-887-2444
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FL	Coral Springs, HAI Elctrns.	305-752-7520
GA	Norcross, R.O. Whitesell & Assocs.	404-449-9190
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NC	Greensboro, R.O. Whitesell & Assocs.	919-273-1945
OH	Dayton, R.O. Whitesell & Assocs.	513-298-9546
OK	D&O Engrg. Co.	316-686-2808
PA	Churchville, Dynamic Elctrn. Sls.	215-322-2611
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GA	Tucker, MacKay Smith Assocs.	404-496-9913
IL	Skokie, Electro Tech Mktg.	312-676-3151
IN	Greenfield, France Entprs.	317-462-6098
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TX Richardson, Barry Sales 214-234-0255
UT Salt Lake City, Lindberg Co. 801-277-2643
WI Milwaukee, Berndt Assocs. 414-545-8400

Local Distributors
CA Carlsbad, Surcom Assocs. 619-438-4420
IL La Fox, Richardson Elctrns., Ltd. 312-456-0600

LSI LOGIC CORP., 1551 McCarthy Blvd., Milpitas, CA 95035, Tel: 408-433-8000, TELEX: 172153; *Dist. Mgr.:* John Mucciaro

LTI, INC., 6445 N. Hamlin Ave., Lincolnwood, IL 60645, Tel: 312-679-7500, TWX: 5101008622, FAX: 312-679-7981; Empl.: 60; *Sls. Mgr.:* Mike Khetarpal

LTX, LTX Pk. @ University Ave., Westwood, MA 02090, Tel: 617-461-1000, TELEX: 4430108, TWX: 710-348-6621, FAX: 617-326-5895; Empl.: 1,500; *Sls. Mgr.:* Roger Blethen, Sr. V.P. Sls.

LUCAS DURALITH CORPORATION, 525 Orange St., Millville, NJ 08332, Tel: 609-825-6900, TWX: 510-687-7520, FAX: 609-825-6345; Empl.: 375; *Sls. Mgr.:* Chip Edstrom ..... **B•1873**

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IL Arlington Hgts. 312-394-3775
MD Baltimore 609-825-6900
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MI Plymouth, Leading Edge Sales Corp. 313-420-3344
MN Minneapolis, OEM Products 612-541-0236
NJ Millville 609-825-6900
NY New York 212-582-5629
NY Rochester 716-442-7270
NC Raleigh 919-821-5684
OH Columbus 614-228-0800
PA Philadelphia 215-923-6282
TX Dallas 214-522-8150
WA Bellevue 206-453-9383
Can Rexdale, Ontario, True North Technologies 416-744-2233

LUCAS EPSCO, INC., 99 South St., Hopkinton, MA 01748-2204, Tel: 508-435-2400, TELEX: 95-1110, FAX: 508-435-2022; FSC No.: 15894; Empl.: 240; *Sls. Mgr.:* John M. Shalhoub

Lucas Ledex

FAX: 513-898-8624

LUCAS LEDEX INC., P.O. Box 427, 801 Scholz Dr., Vandalia, OH 45377-0427, Tel: 513-898-3621, TELEX: 6874241/6874243; FSC No.: 81840; Empl.: 450; *Sls. Mgr.:* T. C. Ristoff ..... **B•1654, 1666-1669, 1784-1785, 1964-1965**

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AZ Scottsdale, Arcom Sls., Inc. 602-947-5745
CA San Diego, Interstate Mktg. Assocs. 619-693-3220
CA Saratoga, Testco, Inc. 408-253-1900
CA Woodland Hills, Interstate Mktg. Assocs. 818-883-7606
CO Englewood, Dynatech, Inc. 303-773-2830
CT Bloomfield, SIR-Assocs. 203-243-9343
FL Largo, Techn. Mktg. Assocs. 813-541-1591
FL Melbourne, Techn. Mktg. Assocs. 407-676-3776
FL Orlando, Techn. Mktg. Assocs. 407-857-3760
FL Pompano Beach, Techn. Mktg. Assocs. 305-977-9006
GA Duluth, DHR Mktg., Inc. 404-564-0529
IL Elk Grove Vl, Control Sls., Inc. 312-595-2110
IN Beech Grove, Control Sls. Inc. 317-786-2272
IN Ft. Wayne, Control Sls., Inc. 219-483-5198
IN Newburg, Control Sls., Inc. 812-853-2518
KS Leawood, Thunderbird Tech. Sls. & Svcs. 913-642-7220
KS Wichita, Thunderbird Tech. Sls. & Svcs. 316-636-5777
MA Westford, SIR Assocs. 508-692-2500
MI Royal Oak, Hilltronics, Inc. 313-435-0920
MN Minneapolis, Josco/Melius, Inc. 612-861-3343
MO Maryland Heights, Thunderbird Tech. Sls. & Svcs. 314-298-8940
NY Clark Mills, KLM-Garner Co. 315-853-6126
NY Oceanside, Bittan Assocs., Inc. 516-678-6222
NY Pittsford, KLM-Garner Co. 716-381-8350
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OH Cleveland, Del Steffen & Assocs., Inc. 216-461-8333
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OH Lexington, Del Steffen & Assocs., Inc. 419-884-2313
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PA King of Prussia, Freedman-Malta Assocs. 215-337-9211
SC Greenville, DHR Mktg., Inc. 803-235-3594
TN Nashville, DHR Mktg., Inc. 615-331-2745
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TX Houston, ION Assocs., Inc. 713-537-7717
WA Bellevue, Testco, Inc. 206-454-7422
WA Vancouver, Testco, Inc. 206-693-7262
WI Brookfield, Control Sls., Inc. 414-797-9500

LUCAS WESTERN INC., Electro Systems Division, 610 Neptune Ave., Brea, CA 92621, Tel: 714-671-4500, TWX: 910-584-4856, FAX: 714-671-4503; Empl.: 175; *Sls. Mgr.:* Jerry Neumayer

LUFF RESEARCH, Box 449, Jackson Hgts., NY 11372, Tel: 718-429-5900, FAX: 718-478-4969; Empl.: 5; *Sls. Mgr.:* R. Scheer

LUFT INSTRUMENTS, INC., Hillside Rd., P.O. Box 214, Lincoln, MA 01773, Tel: 617-259-9215, TELEX: 247316 RCA; Empl.: 12

LUMEX OPTO/COMPS., INC., 292 E. Hellen Rd., Palatine, IL 60067, Tel: 312-359-2790, FAX: 312-359-8904; Empl.: 125; *Sls. Mgr.:* Fred Schneider; *Dist. Mgr.:* Bert Musser

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MO Maryland Hgts., Midwest Meridian 314-878-4441
OH Dayton, Midwest Meridian 513-256-6960
PA Easton, Kendon Co. 215-253-3100
TX Ft. Worth, Midwest Meridian 817-589-1711

LUTRON ELECTRONICS CO., 205 Suter Rd., Coopersburg, PA 18036, Tel: 215-282-3800, TELEX: 847475, TWX: 510-651-3755; Empl.: 378; *Sls. Mgr.:* John McKiernan; *Dist. Mgr.:* Robert Van Horne

LUXO LAMP CORP., P.O. Box 951, Port Chester, NY 10573, Tel: 914-937-4433, TELEX: 137-336, FAX: 914-937-7016; Empl.: 150; *Sls. Mgr.:* Robert H. Newton

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LYON METAL PRODUCTS, 47 Railroad Ave., Aurora, IL 60507, Tel: 312-892-8941, TWX: 910-232-3132; Empl.: 600; *Sls. Mgr.:* R. R. Bodlund

LYTRON INCORPORATED, Dragon Court, Woburn, MA 01801, Tel: 617-933-7300, TELEX: 951-934, FAX: 617-935-4529; Empl.: 75; *Sls. Mgr.:* Edwin Carell

LZR*electronics,inc.*

FAX: 301-670-0436

LZR ELECTRONICS, INC., 8051 Cessna Ave., Gaithersburg, MD 20879, Tel: 301-921-9440; Empl.: 35; *Sls. Mgr.:* Phil Aliff; *Dist. Mgr.:* Dave Ballog ..... **B•1786-1787, 1875; C•1415-1436, 1868-1872; D•1033-1037, 1900-1907**

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TX Dallas, Advanced Tech. Sls. 214-340-1300
TX Houston, Advance Tech. Sls. 713-440-3888
Can Downsview, Ont., Telbit Elctrns., Inc. .. 416-633-5050

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MACOM, INC., 43 Second Ave., Bldg. 8, Burlington, MA 01803, Tel: 617-272-3000, TELEX: 94-9464, TWX: 710-332-6789

M/A-COM LASER DIODE, INC., See Laser Diode, Inc., Div. of Morgan Crucible

M/A-COM OMNI SPECTRA, INC., 21 Continental Blvd., Merrimack, NH 03054, Tel: 603-424-4111, TWX: 710-366-0674, ESYLNK: 62038279, FAX: 603-424-6580; FSC No.: 16179; Empl.: 750

M/A COM LTD., Humphrey Rd., Dunstable, Bedfordshire, England LU5 4SX, England, Tel: 44(582)471200, TELEX: 82295; Empl.: 500; *Sls. Mgr.:* D. McGuinness

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MAC PANEL CO., P. O. Box 7728, 551 W. Fairfield Rd., High Point, NC 27264, Tel: 919-884-8111, TWX: 510-926-1542, FAX: 919-887-1565; FSC No.: 16654; Empl.: 90; *Sls. Mgr.:* T. A. Hayworth

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MACRODYNE, P.O.Box 1079, Schenectady, NY 12301, Tel: 518-356-3500, FAX: 518-356-3505; Empl.: 22; *Sls. Mgr.:* Robert L. Grinnell

MACROLINK, 1500 N. Kellogg Drive, Anaheim, CA 92807, Tel: 714-777-8800, TWX: 910-591-1671; Empl.: 25; *Sls. Mgr.:* Bill Goodale

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MACRONETICS, See Veeco Instrs. Inc.

MAG-CON, 1626 Terrace Dr., St. Paul, MN 55113, Tel: 612-633-8820, FAX: 612-633-1851; Empl.: 40; *Sls. Mgr.:* M. Crellin

MAGNATROL VALVE CORP., 67 Fifth Ave., Hawthorne, NJ 07507, Tel: 201-427-4341, ESYLNK: 130357, FAX: 201-427-7611; *Sls. Mgr.:* R. Kretschmer

MAGNECOMP, INC., P.O. Box 625, Gravley Rd., Pickens, SC 29671, Tel: 803-878-4700; Empl.: 10; *Sls. Mgr.:* T. Sullivan ..... **A•2323**

MAGNECRAFT ELECTRIC CO., 1910 Techny Road, Northbrook, IL 60062-5376, Tel: 312-564-8800, TWX: 910-221-0122, FAX: 312-564-3027; FSC No.: 94696; Empl.: 700; *Sls. Mgr.:* Wiley Greenwood; *Dist. Mgr.:* Wiley Greenwood

MAGNELAB CORPORATION

FAX: 303-447-1588

MAGNELAB, 7315 Red Deer Dr., Boulder, CO 80301-4696, Tel: 303-442-6700; FSC No.: 58439; Empl.: 25; *Sls. Mgr.:* Carl A. Forsberg ..... **A•2324-2325**

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WA Bellevue, Advanced Power Comps. ... 206-747-9127
WA Seattle, Advanced Power Comps. 206-527-7945

MAGNETIC COMPONENT ENGINEERING, INC., 11379 Playa Street, Culver City, CA 90230, Tel: 213-398-4761; FSC No.: 52634; Empl.: 12; *Sls. Mgr.:* D. V. Cropsey

mi

FAX: 317-549-0502

MAGNETIC INSTRUMENTATION, 8350 E. 48TH ST., Indianapolis, IN 46226, Tel: 317-545-2102, TELEX: 27-2111; Empl.: 35 ..... **D•1318**

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MAGNETICO INC.

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MAGNETICO INC., 182 Morris Ave., Holtsville, NY 11742, Tel: 516-654-1166; FSC No.: 10581; Empl.: 65 ..... **A•2331**

MAGNETICS, Spang & Co., Box 391, Butler, PA 16003-0391, Tel: 412-282-8282, TWX: 710-373-3821, FAX: 412-282-6955; Empl.: 750; *Sls. Mgr.:* J. F. Huth

MAGNETIC SHIELD CORPORATION, Perfection Mica Co., 750 North Thomas Dr., Bensenville, IL 60106, Tel: 312-766-7800, TWX: 910-256-4815, FAX: 312-766-2813; Empl.: 43 ..... **C•1743-1745**

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MA Framingham, Harvard Technlg. 617-899-4568
MI Livonia, Amtech Reps. 313-474-8300
MN Minneapolis, Josco-Meluis & Assocs. . 612-861-3343
NM Albuquerque, IMEC 505-883-9010
NJ Morristown, Kenneth L. Love Assocs. . 201-540-0204
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MAGNOS, 6 Old School House Rd., Harvard, MA 01451, Tel: 617-456-8880, TELEX: 951417 MAGN; Empl.: 5 ..... **D•1319**

MAGNUM MICROWAVE CORP., 4575 Cushing Pkwy., Fremont, CA 94538, Tel: 415-657-9898, FAX: 415-490-3351; FSC No.: 59277; Empl.: 70; *Sls. Mgr.:* Harry L. Fowler

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CO Englewood, Odyssey 1 303-773-8176
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NY New Rochelle, Robert Diamond, Inc. .. 914-632-2828
TX Garland, Carey, McMahill Assocs. 214-681-1414
VA Arlington, Neal Deoul Associates 703-486-0660
WA Bellevue, Thorson Company Northwest 206-455-9180

MAGNUM OPUS CUSTOM ELCTRN. ENGRG., 284 Kennedy St., Iselin, NJ 08830, Tel: 201-283-4925; *Sls. Mgr.:* R. Galanty ..... **D•1129**

MAG-TEK, 20725 S. Annalee Ave., Carson, CA 90746, Tel: 213-631-8602, TWX: 510-600-0621 MAG TEK CRSN, FAX: 213-631-3956; *Dist. Mgr.:* Shelley Schira

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IL Schaumburg, Silvers Elctrn. Sls. 312-893-7999
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VA Danville, F.B.D. Sls. 804-791-1499
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NY Manlius, LamTec Sls. Corp. 315-682-4780
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SC Greenville, DHR Mktg., Inc. 803-235-3594

MALLORY COMPONENTS DIVISION, Emhart Elec./Elctrn. Grp., P.O. Box 210, 1079 Parkinson Rd., Woodstock, Ont., Canada N4S 7W8, Tel: 519-539-4891, TELEX: 23 MOY 001, FAX: 519-539-6684; FSC No.: 37942;76055; *Sls. Mgr.:* Joe Lablante; *Dist. Mgr.:* John Morris ..... **A•1113, 2120**

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CA San Francisco, Manhattan Elec. Cable Corp. 800-423-4040
OH Cleveland, Manhattan Elec. Cable Corp. 216-362-7900

MANN, HENRY, INC., 3983 Mann Road, Huntingdon Valley, PA 19006, Tel: 215-355-7200, TELEX: 6851160, FAX: 215-355-5134; Empl.: 52; *Sls. Mgr.:* Dan Martin; *Dist. Mgr.:* Mickey Hoffer

MANTEX CORP., 1800 Metamora Rd., P.O. Box 15E, Oxford, MI 48051, Tel: 313-628-8200, FAX: 313-628-1520; Empl.: 100; *Sls. Mgr.:* John R. Santiago

Manufacturers Components Incorporated

FAX: 305-823-8934

MANUFACTURERS COMPONENTS, INC., 2260 W. 77 St., Hialeah, FL 33016, Tel: 305-556-4481, 800-367-0377, TELEX: 514181; Empl.: 5; *Sls. Mgr.:* Jackie Barker ..... **B•1788**

Local Sales Offices & Reps

IL Chicago, Kruse Corp. 312-745-9073
MN Minneapolis, Chris & Assocs. 612-861-1634
MO Macon, Klootwyk Agy. 816-385-2341
OH Cleveland, RK Component 216-642-9312
PA Norristown, Intek 215-631-0577
TX Richardson, PSI 214-644-0483
WI Montello, Kruse Corp. 608-297-2916

Local Distributors

MI St. Clair Shores, Spemco 313-771-2700

MANU-TRONICS, INC., 8701-100th St., Lakeview Corporate Park, Kenosha, WI 53142-9508, Tel: 414-947-7700 , 414-947-7302, FAX: 414-947-7729; Empl.: 300

MARATHON POWER TECHNOLOGIES, P.O. Box 8233, Waco, TX 76714-8233, Tel: 817-776-0650, TWX: 910-894-5203 MARATHON WAC

MARATHON SPECIAL PRODS., 13300 Van Camp Rd., Bowling Green, OH 43402, Tel: 419-352-8441, TWX: 810-499-2988, FAX: 419-352-0875; Empl.: 150; *Sls. Mgr.:* J. Campisi

MARCON AMERICA CORP., 998 Forest Edge Dr., Vernon Hills, IL 60061, Tel: 312-913-9980, FAX: 312-913-1150; Empl.: 11; *Sls. Mgr.:* Tony Olita; *Dist. Mgr.:* Helen A. Stubbs

MARCONI INSTRUMENTS, 3 Pearl Court, Allendale, NJ 07401, Tel: 201-934-9050, TWX: 710-991-9752; *Sls. Mgr.:* William E. Bean ..... **D•1320**

Local Sales Offices & Reps

AL Huntsville, Beacon Elctrns. Assocs. ... 205-881-5031
CA Carson, Amasco-South 213-516-8561
CA San Diego, Amasco-South 619-565-9676
CA San Jose, Amasco-North 408-262-1500
FL Boca Raton, Beacon Electrns. Assocs. 305-392-3500
GA Atlanta, Beacon Electrns. Assocs. 404-256-9640
IL Chicago, K.W. Meyers 312-882-4808
IN Indianapolis, K. Meyers 317-783-1030
MD Burtonsville, Eastern Instrmn. 301-792-7039
MA Chelmsford, ICS Assocs. 617-256-3350
MN Minneapolis, K.W. Meyers 612-920-7080
MO Maryland Hgts., Comms. Equip. Specialties 314-291-7841
NJ Elmwood Park, L & M Assocs. 201-797-0441
NM Albuquerque, Scientific Dvcs. 505-883-3668
NY New York City, L & M Assocs. 212-243-6155
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WA Woodinville, Del Black Assoc. 206-788-6131

MAREL INSTR. CO., 907 South East 13th Pl, Cape Coral, FL 33990, Tel: 813-574-8788; Empl.: 14; *Sls. Mgr.:* T. Swift

MARKAT DIV., Wild Oats Corp., 902 Charles St, N. Myrtle Bch, SC 29582, Tel: 803-249-5191; Empl.: 209; *Sls. Mgr.:* K. L. Campbell; *Dist. Mgr.:* W. B. Heather

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FAX: 215-270-3138

MARKEL CORP., P.O. Box 752, Norristown, PA 19404, Tel: 215-272-8960, TWX: 510-660-0929; FSC No.: 03890; Empl.: 228; *Sls. Mgr.:* E. Thomas Norris; *Dist. Mgr.:* L. J. Clemente ..... **C•1698**

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AL Huntsville, Alpha Mktg. 205-533-0766
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AR Hot Springs, MYA, Inc. 501-262-1365
CA LA, Natl. Wire & Cable 213-225-5611
CA Santa Clara, Penmark Sls. 408-980-1303
CO Niwot, Reliance 303-652-2717
CT Hamden, Datcom 203-288-7005
FL Deerfield Bch., Jack Krutek & Assoc. .. 305-427-4202
GA Norcross, Alpha Mktg 404-448-2050
IL Schiller Pk., Wm. R. Bolles 312-678-7888
IN Indianapolis, D. M. Assocs. 317-842-4424
KS Lenexa, Midtec 913-541-0505
MD Glen Burnie, F. Lott 301-744-4611
MA Waltham, Datcom 617-891-4600
MI Farmington, L. George & Assoc. 313-474-1505
MN Edina, PWC 612-933-3393
MO Florissant, O C B Sls. 314-837-3361
NJ Colonia, Heft & Ficarra 201-381-5193
NM Albuquerque, Shefler-Kahn 305-296-0749
NY Lynbrook, Heft & Ficarra 516-599-3351
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PA Flourtown, C. Newson 215-248-3377
SC Greenville, Electrolock Inc. 803-297-9830
TN Murfreesboro, Alpha Mktg. 615-896-6102
TX Richardson, C.J. Garvey 214-234-3371
WA Seattle, James J. Backer 206-285-1300
WI Mequon, Wm. R. Bolles 414-241-3320
EXP Blue Bell, PA, Markel Corp., Exp. Dept. 215-825-5710
Can Rexdale,Ont, True North Technology 416-744-2233

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CA Torrance, Insulation Supp. 213-320-9400
CO Denver, Ward Elec. Supp. 303-333-3541
CT Greenwich, R. H. Carlson 203-531-5500
CT Hartford, Atlantic Switch 203-527-7705
FL Davie, Arco Distrs. 305-473-2550
FL Lakeland, Switch Controls 800-282-7619
GA Atlanta, Accu-Tech Cable 404-455-6422
IN Indianapolis, Marian Rubber 317-638-6525
KS Wichita, Midwest Aircraft Supp. 316-267-3318
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MO St. Charles, Lectronix 314-946-6424
NY Rochester, Simcona Elctrns. 716-328-3230
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SC Greenville, Electrolock, Inc. 803-297-9830
TN Chattanooga, Technitronics 615-875-5449
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VA Roanoke, Control Distr. Inc. 703-989-7925
Can Mississauga, Ont., Marflex-Barrett Ltd. 416-828-0220

MARKEM CORP., 150 Congress St, Keene, NH 03431, Tel: 603-352-1130, TELEX: 710-366-1800, FAX: 603-357-5871; FSC No.: 38360; Empl.: 1200; *Sls. Mgr.:* Carl Panza

MARKENRICH CORP., 1812 Flower Avenue, Duarte, CA 91010, Tel: 818-359-9190, TELEX: 298727, FAX: 818-359-5223; FSC No.: 63837; Empl.: 8

MARK EYELET INC., AMP, Inc., 63 Wakelee Rd, Wolcott, CT 06716, Tel: 203-756-8847, TELEX: 69-6191, FAX: 203-755-9410; Empl.: 70; *Dist. Mgr.:* Larry Fegley

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CA San Jose, Eclipse Sls. 408-435-3800
CT Cheshire, Connecticut Applied Technlg. 203-272-6564
FL Tampa, SRT Mktg. 813-884-4805
IL Elk Grove Vl, Tristar Grp., Inc. 312-593-0200
KS Olathe, Tech. Sls. Assocs. 913-829-2800
MA Burlington, Conti-Younger Assocs., Inc. 617-273-1582
MI Plymouth, Leading Edge Sls. Corp. 313-420-3344
MN Golden Valley, Ambassador Indl. Mkg. 612-542-8437
MO Ferguson, Technical Sls. Assocs. 314-521-2044
NJ Cherry Hill, Vantage Sls. 609-424-6777
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NY Menands, Marktech Intl. Corp. 518-437-1271
NC Greensboro, Arthur, Harris Assocs. 919-674-9849
OH Maple Hgts., Versatron 216-581-0090
OK Tulsa, Mil-Co Mktg. 918-664-2277
TX Richardson, Mil-Co Mktg. 214-783-2785
WA Bellevue, Caruso & Co. 206-455-8811
WI Brookfield, Tristar Group 414-782-2670
Can Markham, Avotronics 416-475-2024

Local Distributors

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AZ Phoenix, Future Elctrns. 602-968-7140
CA Agoura Hills, Pacesetter Elctrns. 818-991-3984
CA Anaheim, Pacesetter Elctrns. 714-777-4711
CA Chatsworth, Future Elctrns. 818-772-6240
CA Irvine, Future Elctrns. 714-250-4141
CA Irvine, J & J Elctrns. 714-455-0104
CA Laguna Hills, Elctrn. Svcs. 714-472-0454
CA Orange, Distributed Microtechnology 714-921-1830
CA San Diego, Future Elctrns. 619-278-5020
CA San Jose, All American Semiconductor 408-943-1200
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FL Clearwater, Future Elctrns. 813-578-2770
FL Largo, Elctrn. Precepts of FL 813-544-3636
FL Miami, All American Semiconductor ... 305-621-8282
GA Norcross, Future Elctrns. 404-441-7676
IL Schaumberg, Future Elctrns. 312-882-1255
MD Columbia, Future Elctrns. 301-995-1222
MA Billerica, Baldwin Comps. 508-667-6710
MA Norwood, Emtel Elctrns. 617-769-9500
MA Wakefield, All American Semiconductor 617-246-2300
MA Westborough, Future Elctrns. 508-366-2400
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MA Worcester, Coghlin Elctrns. 508-791-7861
MI Grand Rapids, SF Elctrns. 616-459-0216
MI Livonia, Future Elctrns. 313-261-5270
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MN New Brighton, Chris Elctrns. 612-631-2647
MO St. Louis, Franklin Elctrns. 314-993-5333
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NY Ronkonkoma, Baldwin Comps. 516-588-5700
NY Syracuse, Future Elctrns. 315-451-2371
NC Charlotte, Future Elctrns. 704-529-5500
NC Raleigh, Resco 919-781-5700
NC Winston-Salem, Kirkman Elctrns. 919-722-9131
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OR Beaverton, Norvac Elctrns. 503-644-1025
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TX Richardson, Future Elctrns. 214-437-2437
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WA Redmond, Future Elctrns. 206-881-8199
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Can Vancouver, Future Elctrns. 604-294-1166

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FAX: 214-341-5212

MARLOW INDUSTRIES, INC., 10451 Vista Park Rd, Dallas, TX 75238-1645, Tel: 214-340-4900, TWX: 910-860-5161; FSC No.: 55686; Empl.: 170; *Sls. Mgr.:* John Nelson; *Dist. Mgr.:* David Marlow ..... **C•1672-1673**

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FAX: 315-655-8042

MARQUARDT SWITCHES INC., Route 20 East, P.O. Box 465, Cazenovia, NY 13035, Tel: 315-655-8050, TELEX: 703-287-UD; *Sls. Mgr.:* J. J. Kennedy, VP Sls.; *Dist. Mgr.:* R. A. Philipchik, VP Mktg. ..... **B•1791-1797**

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AL Huntsville, Electrosales Co. 205-830-2715
AZ Scottsdale, Memco Sls., Inc. 602-952-2254
CA Los Angeles, Universal Components, Inc. 213-641-4255
CA Santa Clara, Nova-Tronix Inc. 408-727-9530
FL Hollywood, Stand. Mktg., Inc. 305-435-1047
FL Tampa, Stand. Mktg., Inc. 813-933-5833
FL W. Melbourne, Stand. Mktg., Inc. 407-725-7073
GA Atlanta, Electrosales Co. 404-394-1122
IL Franklin Pk., Stetco 312-671-4208
IN Fort Wayne, J & B Engrg. 219-483-2813
IN Indianapolis, J & B Engrg. Sls. Co. 317-842-3008
IA Marion, M-S-B Assocs., Inc. 319-377-6261
KS Shawnee Mission, M-S-B Assocs., Inc. 913-432-2131
MI Grand Blanc, Inter-Comm 313-695-0665/0666
MN St. Paul, Arkco Sls Co. 612-777-7454
MO St. Louis, M-S-B Assocs. 314-946-5577
NH Nashua, Bell Controls, Inc. 603-882-6984
NJ Medford, Champion Elctrn. Sls. Co., Inc. 609-983-0932/0807/9007
NY Cazenovia, S.T./Woolard Co. 315-655-8145
NC New Bern, R-A Sls. 919-244-2672
OH Cleveland, J & B Engrg. Sls. Co. 216-642-9312
OR Portland, Elctrn. Comp. Sls. 503-245-2342
SC Easley, R-A Sls. Co. 803-859-1859
SC Pickens, R-A Sls. Co. 803-859-1859
TX Dallas, Rem-Air Comps. 214-234-1069
TX Houston, Rem-Air Comps. 214-234-1069
CO Lakewood, Cristee Meade Co. 303-232-0287
WA Kirkland, Elctrn. Comp. Sls. 206-232-9301
WA Mercer Island, Elctrn. Comp. Sls. 206-232-9301
WI Milwaukee, Key Entpr., Inc. 414-453-9462

Local Distributors

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CA San Jose, Sierra West 408-435-7477
CA Van Nuys, Pacific Switch Controls, Inc. 213-873-4802
CO Aurora, Jet Elctrns. 303-364-1000
CO Denver, CSID, Inc. 303-292-9594
CT Hartford, Atlantic Switch Controls, Inc. 203-527-7705
CT Hartford, Wes-Garde Comps. Grp., Inc. 203-527-7705
FL Ft. Lauderdale, N.R.C. Elctrns., Inc. 305-772-4500
FL Lakeland, Switch Controls 813-644-7564
FL Longwood, Stetco, Inc. 407-767-0209
FL West Palm Beach, Nurmi Electrns. 305-686-8553
GA Atlanta, KSM Elctrns., Inc. 404-458-2013
GA Stone Mtn., Control Design Supp. 404-979-3500
IL Addison, L Comp 312-628-1400

IL Bensenville, Voyager Elctrns. 312-860-1300
IL Carol Stream, Conectrix, Inc. 312-653-1460
IL Franklin Pk., Stetco, Inc. 312-671-4208
KS Wichita, L Comp 316-291-3585
KS Wichita, Radio, Inc 316-264-2798
MA Wilmington, J-V Elctrns. 617-657-6523
MI Grand Rapids, S.F. Elctrns. 616-459-0216
MI St. Clair Shores, Spemco 313-771-2700
MN Fridley, Voyager Elctrns. 612-571-7766
MN Minneapolis, Control Design Supp. 612-721-1628
MO Kansas City, L Comp 816-221-2400
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NY Woodside, Switches unltd. 718-478-5000
NC Charlotte, Control Design Supp., Inc. .. 704-588-4410
NC Gastonia, J.M.T. Electronics 704-867-4401
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OK Tulsa, Radio, Inc. 918-587-9123
OR Beaverton, Murphy Electrns,Inc. 503-642-2001
PA Newtown Sq., Q.D.I. 215-359-1000
TN Chattanooga, Stetco, Inc. 615-899-6831
TN Chattanooga, Techni Tronics Inc. 615-842-0514
TX Austin, Southwest Electrns. 512-343-7694
TX Dallas, Southwest Electrns. 214-234-3050
TX Dallas, Texas Switch, Inc. 214-357-1768
TX Houston, Wofford Elctrns., Inc. 713-847-3583
TX Stafford, Southwest Electrns. 713-240-4000
WA Redmond, Murphy Electrns. 206-881-1234
Can Concord, Ont., Votron Elctrns., Ltd. 416-669-9870

MARSH PRODUCTS, INC., 336 McKee St., Batavia, IL 60510, Tel: 312-879-8008

MARTEL ELECTRONICS, 27 Roulston Rd., P.O. Box 897, Windham, NH 03087, Tel: 603-893-0886, 800-821-0023, TELEX: 4974420, FAX: 603-898-6820; *Sls. Mgr.:* David DeVries

MARTIN SOUND PRODS. INC., 28 Alpha Park, Cleveland, OH 44143-2297, Tel: 216-442-2286; Empl.: 4; *Sls. Mgr.:* DeWayne (Bud) Martin; *Dist. Mgr.:* DeWayne (Bud) Martin

MARWAY PRODUCTS INC.

FAX: 714-973-2931

MARWAY PRODS. INC., 311 N. Clara St., Santa Ana, CA 92703, Tel: 714-973-1800; FSC No.: 60955; Empl.: 18; *Sls. Mgr.:* Tom Goreth ..... **D•2214-2215**

Local Sales Offices & Reps
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CA Santa Ana, Marway Prods., Inc. 714-973-1800
CO Monument, Sunbird Inds., Inc. 719-481-2900
CT N.Haven, PCS-Power Conversion Sys. 203-281-7270
FL Land O' Lakes, AJ's Power Source, Inc. 813-996-2583
MD Lanham, Sel-Tronics, Inc. 301-731-8080
MA Wellesley, PCS-Power Conversion Sys. 617-235-7884
MN Wayzata, Golz Assocs., Inc. 612-473-5732
NH Londonderry, PCS- Power Conversion Sys. 603-434-2371
NY Fairport, Hi-Tec Sls. Assocs. 716-223-5922
PA Bridgeport, Penncat Corp. 215-272-0505
TX Richardson, Interactive Comp. Sls. 214-669-2277
WA Bellvue, Underwood Hanify 206-643-1793

MASTECH, INC., Lorlin Test Systems, Precision Rd., Danbury, CT 06810, Tel: 203-744-0096, TELEX: 7104565030; Empl.: 57; *Sls. Mgr.:* L. Sanders Corbit

MASTER APPLIANCE CORP., 2420 18th St., Box 68, Racine, WI 53403, Tel: 414-633-7791, TELEX: 269-505; FSC No.: 83284; Empl.: 50; *Sls. Mgr.:* G. E. Mertins; *Dist. Mgr.:* G. E. Mertins

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MEC

FAX: 213-399-8600

MASTER ELECTRONIC CONTROLS, P.O. Box 25905, Los Angeles, CA 90025, Tel: 213-452-1336, TELEX: 182041; Empl.: 74; *Sls. Mgr.:* Don Minassian; *Dist. Mgr.:* Don Minassian ..... **B•1576-1577**

Local Sales Offices & Reps
CA Los Angeles, Master Distrs. 213-829-4656
CA Santa Monica, Master Distrs. 213-452-1229

MATEC INSTRUMENTS, INC., 75 South St., Hopkinton, MA 01748, Tel: 617-435-9039, TELEX: 948332, FAX: 617-435-5289; Empl.: 55; *Sls. Mgr.:* Harry Ives

MATERIALS RESEARCH CORPORATION, Route 303, Orangeburg, NY 10962, Tel: 914-359-4200, TELEX: 221862 MRC UR, FAX: 914-425-6075; Empl.: 560; *Sls. Mgr.:* Mel Lipton

MATH ASSOCS., 2200 Shames Dr., Westbury, NY 11590, Tel: 516-334-6800, TELEX: 238-667 RAPID UR, FAX: 516-334-6473; Empl.: 45; *Sls. Mgr.:* Ed Henckel

MATHEMATICAL SYSTEMS DESIGN, INC., 11835 W. Olympic Blvd., Suite 745, Los Angeles, CA 90064, Tel: 213-479-7180; *Sls. Mgr.:* Lorr Kramer

Local Distributors
MD Columbia, Mesa Technlg. Corp. 800-950-6372

MATRIX CORP., 2260 Distributors Dr., Indianapolis, IN 46241, Tel: 317-248-2036; Empl.: 10 ..... **D•1192**

Local Sales Offices & Reps
FL Orlando, James Terry & Assoc. 305-894-4717

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CA Irvine, Acacia/VWR Elctrns. 714-660-0834, 213-971-2428
CA La Crescenta, Mulvin & Co. 213-245-1081
CA San Diego, Acacia/VWR Elctrns. 619-565-4365
CA San Diego, Richey/Impact Elctrns., Inc. 619-271-4511
CA San Jose, Powell Elctrns. 408-943-9020
CA San Jose, Richey/Impact Elctrns., Inc. 408-432-7100
CA San Jose, Shelley/Ragon 408-942-9111
CA Santa Clara, DC Elctrn. Supp. 408-980-1199
CA Sun Valley, Richey/Impact Elctrns., Inc. 818-768-3800,213-875-2862
CA Sunnyvale, Acacia/VWR Elctrns. 408-745-7200
CA Tustin, DC Elctrns. 714-259-9066
CO Englewood, Shelley/Ragon 303-762-0670
CO Lakewood, Acacia/VWR Elctrns. 303-232-2882
CT East Haven, JV Elctrns. 203-469-2321
CT Yalesville, Schaal Assocs./Deanco ... 203-269-3779
FL Clearwater, Tech. Sls. 813-539-7429
FL Ft. Lauderdale, Powell Elctrns. 305-979-5000
FL Winter Park, Deanco 305-671-5100
GA Marietta, Deanco 404-429-0126
IL Chicago, NEP Elctrns., Inc. 312-625-8400
IL Mt. Prospect, Magnuson Elctrns. 312-956-0700
IL Skokie, EL/Mech. 312-967-8530
IN Indianapolis, Graham Elctrns. 317-634-8202
MD Columbia, Aztech Elctrns. 301-621-8890
MD Columbia, Powell Elctrns. ..... 301-995-0410, 301-621-4070 in
MD Gaithersburg, Deanco 301-948-5444
MA Allston, Vector Sls. 617-787-2790
MA Burlington, Schaal Assocs./Deanco ... 617-272-1506
MA Canton, Richey/Impact Elctrns. 617-821-1500
MA Westboro, Powell Elctrns. 617-366-6100
MI Grand Rapids, RM Elctrns. 616-531-9300
MI Southfield, Michigan Lectrols 313-353-1350
MN St. Paul, Shelley/Ragon Elctrns. 612-642-2828
MO Independence, Shelley/Ragon Elctrns. 816-254-3410
MO St. Charles, Lectronix ... 314-946-6424,800-325-3348
MO St. Louis, El/Mech 314-527-4830
NJ Clifton, J-Mar Elctrns. 201-772-6400
NJ Englewood, Powell Elctrns. 201-894-0800
NJ Fairfield, Deanco 201-575-7960
NJ Union, Meridian Supp. 201-687-6220
NM Albuquerque, Alliance Elctrns. 505-292-3360
NY Farmingdale, Addem Distrs. 516-752-9303
NY Hauppauge, Schaal Assocs./Deanco 516-434-7100
NY Ithaca, Deanco 607-257-4444
NY Ronkonkoma, Zenith Wire & Cable ... 516-585-1444
NC Cary, Powell Elctrns. 919-467-1212
NC Charlotte, Elctrns. Mktg. Corp. 704-394-6195, 800-432-0549
NC Raleigh, Deanco, Inc. 919-851-2065
NC Raleigh, Meridian Supp. Co. 919-872-1565
OH Columbus, Elctrns. Mktg. Corp. 614-299-4161
OH Dayton, Elctrns. Mktg. Corp. 513-439-4711
OH Highland Heights, Elctrns. Mktg. Corp. 216-442-3441
OK Tulsa, Norvell Elctrns. 918-663-1247
OR Beaverton, Acacia/VWR Elctrns. 503-646-3377
OR Beaverton, Shelley/Ragon 503-641-1691
OR Tualatin, Moore Elctrns., Inc. 503-692-5333
PA Malvern, Transtek Inds. 215-296-4400
PA Philadelphia, Powell Elctrns. 215-365-1900
TN Nashville, Graham Elctrns. 615-367-4400
TX Allen, Prime Distrbg. 214-231-0170
TX Austin, Kent Elctrns. 512-834-1900
TX Austin, Norvell Elctrns. 512-837-5555
TX Dallas, Kent Elctrns. 214-669-2600
TX Dallas, Norvell Elctrns. 214-233-0020
TX El Paso, ERA Elctrns. 915-855-3600
TX Houston, Kent Elctrns. 713-780-7770
TX Houston, Norvell Elctrns. 713-777-1666
TX Plano, Tactic Elctrns. 214-422-0777
WA Lynwood, Blair Hirsh Co. 206-774-8151
WA Redmond, Shelley/Ragon Elctrns. 206-883-2220
WA Seattle, Carlyle Inc. 206-251-0700
VA Virginia Bch., Deanco, Inc. 804-499-3322
WI Milwaukee, Elctrn. Expeditors, Inc. 414-228-8100
Can London, Ont., 3M 519-451-2500

3M FIBER OPTIC PRODUCTS, INC., 420 Frontage Road, W. Haven, CT 06516, Tel: 203-934-7961, TELEX: 358190; Empl.: 42; *Sls. Mgr.:* Raymond Coulombe

3 M PHOTODYNE INC., 3760 Calle Tecate, Camarillo, CA 93010, Tel: 805-388-8378, TELEX: 18-1159, FAX: 1-805-499-9311; FSC No.: 59912; Empl.: 100; *Sls. Mgr.:* Hal Halpern; *Dist. Mgr.:* Hal Halpern

MDF PRODUCTS INC., 7 Johnson Dr., Danbury, CT 06811, Tel: 203-743-3579, TELEX: 499-8051, FAX: 203-744-2704; FSC No.: 60628 ..... **D•1321**

MDS CALIBRATION LAB. INC., 437-H Mary Esther Cutoff, Ft. Walton Beach, FL 32548, Tel: 904-664-1234; *Sls. Mgr.:* Gerry Doiron

MEA DIV., See Mechanized Elctrn. Assembly Div., Universal Instrs. Corp.

MEASUREMENTS GROUP, INC., Box 27777, Raleigh, NC 27611, Tel: 919-365-3800, TELEX: 62919594, FAX: 919-365-3945

FAX: 203-853-6244

MEASUREMENT SYSTEMS, INC., 121 Water St., Norwalk, CT 06854, Tel: 203-838-5561, TELEX: 6813573, TWX: 710-468-2185; Empl.: 97; *Sls. Mgr.:* Tom Brass, Gen. Sls. Mgr. ..... **D•1152**

Local Sales Offices & Reps

AZ	Scottsdale, Advent Comps.	602-481-0044
CA	Anaheim, Gabriel & Assoc.	714-531-7674
IA	Cedar Rapids, S & O Sls.	319-393-7331
MD	Columbia, Robert Elctrn. Sls.	301-995-1900
MA	Hudson, Data Rep	508-481-0333
MN	Edina, Elctrn. Sls., Inc.	612-933-9070
MO	St. Louis, J. S. DeWeese Co.	314-469-7350
OH	Medina, J. C. Hofstetter Co.	216-241-4880
PA	Hickory, J. C. Hofstetter Co.	412-356-2305
TX	Richardson, Scientific Sls. Co.	214-231-6541
VA	Richmond, Robert Elctrn. Sls.	804-276-3979

MEC A/S, Industriparken 23, Ballerup, Denmark DK-2750, Tel: 011-4542973366, TELEX: 9125649, TWX: 2381-125649, FAX: 011-4542 681514; Empl.: 50

FAX: 703-435-1837

MECHANICAL ENTERPRISES, 461 Carlisle Dr., Herndon, VA 22070, Tel: 703-435-9496, TWX: 710-832-0942; Empl.: 25; *Sls. Mgr.:* R.H. Twyford ..... **B•1801, 1876-1877**

Local Sales Offices & Reps

AL	Huntsville, Remco	205-533-3763
CA	Cupertino, West-Comp	408-245-3100
CA	Irvine, Vale Electrn. Assocs.	714-551-4821, 619-693-0113
CO	Boulder, Stratford Grp.	303-530-3194
CT	Bristol, Technlg. Prod. Grp.	203-585-1643
IL	Arlington Heights, Coombs Assocs., Inc.	312-439-9810
IN	Carmel, Newton & Assoc.	317-848-2016
MA	Brookline, Technlg. Prods.	617-731-0858
MI	Jackson, Norwood Scroggs Co.	517-750-1170
MS	Jackson, Doby Assocs.	601-981-1138
NY	Cooperstown, Fitzelle Assoc.	607-547-9333
NY	Hauppauge, Sticom	516-366-4221
NY	LeRoy, Fitzelle Assocs.	716-494-1554
TX	Dallas, Stasco	214-239-4517
WI	Milwaukee, Coombs Assocs., Inc.	414-351-6123

Local Distributors

CA	Los Angeles, Electric Switches, Inc.	213-660-1310
CA	San Diego, Sigma Electrns.	619-565-2000
IL	Wheeling, Hawk Elctrns., Inc.	312-459-4030
NY	Yonkers, Kintronics, Inc.	914-968-7736, 800-431-1658

FAX: 517-782-2810

MECHANICAL PRODUCTS INC., 1824 River St. P. O. Box 729E, Jackson, MI 49204, Tel: 517-782-0391, TWX: 810-253-0827; *Sls. Mgr.:* Dave Olson ..... **B•1401**

Local Sales Offices & Reps

AL	Huntsville, Electro-Mech	205-533-2100
AZ	Tempe, Cantec Sls., Inc.	602-345-1276
CA	Los Angeles, Universal Components Co.	213-641-4255
CA	Sunnyvale, Pass Associates	408-735-9040
FL	Orlando, Honeyco	407-299-1000
GA	Atlanta, Electro-Mech	404-447-6478
IL	Barrington, Perhats Assocs.	312-381-6360
MD	Pikesville, Muncy Sls.	301-484-6376
MI	Rockford, Aidamark	616-874-8744
MN	St. Paul, Mackubin Grp.	612-636-5686
NH	Durham, C. H. Burnham Assocs.	603-868-2282
NJ	Pitman, Colrud Corp.	609-589-5866
NJ	West Caldwell, Grimm, Siegel Assocs., Inc.	201-575-9300
NC	Raleigh, Electro-Mech	919-851-8165
OH	Euclid, Rockford Controls Ohio, Inc.	216-725-3705,
RI	Johnston, C. H. Burnham Assocs.	401-231-7475
TN	Jonesboro, Electro-Mech	615-753-2964
Can	Downsview, Ont., Har Tech	416-665-7773
Can	Pointe Claire, Que., Har Tech	514-694-6110

Local Distributors

CA	Gardena, Cal Switch	213-770-2330/213-538-9830
CA	San Carlos, Campbell & George Co.	415-594-1994
CA	So. San Francisco, Nasam, Inc.	415-872-1155
FL	Ft. Lauderdale, Zelcon, Inc.	305-565-2555/6
FL	Lakeland, Wes-Garde Comps. Grp.	800-282-7619
IL	Carol Stream, Wes-Garde Comps. Grp.	800-323-9431
IL	Chicago, Nep Elctrns.	312-625-8400,
KS	Edwardsville, Tennant Elctrns.	913-441-1801
KS	Wichita, Airtechnics	316-267-2849
MA	Danvers, RCI	617-777-4441
MI	Grand Rapids, S & F Elec. Supp. Co., Inc.	616-459-0216
MN	Minneapolis, Berquist	612-835-2322
NJ	Mount Laurel, Techtron Components Corp.	609-234-1940
NJ	Oakland, Relay Specialties	201-337-1000
NY	Hauppauge, Genelco	516-231-1144/800-645-9802
NY	Hauppauge, Sager Elctrns.	516-289-9747
NY	Plainview, Linrose Elctrns.	516-293-2520
NY	Woodside, Switches Unlimited	800-221-0487
OH	Euclid, Rockford Controls Ohio, Inc.	216-731-5250
TX	Arlington, Bell Components Sls., Inc.	817-461-5303
TX	Dallas, Associated Aircraft Supp., Inc.	214-331-4381
Can	Scarborough, Ont., Carsten Elctrns. Ltd.	416-495-9999
Can	St. Laurent, Que., Tara Inds. Corp.	514-331-6550

MECHANIZED ELCTRN. ASSEMBLEY DIV., UNIVERSAL INSTRS. CORP., See Dover Electronics Manufacturing

MECHATRONICS/SAB, INC., See Seattle Aircraft Bearings

MECO INDUSTRIES, Mechanical Engraving Co., Inc., 4500 Bullard Ave, Bronx, NY 10470, Tel: 212-324-4455, FAX: 212-324-5500; FSC No.: 99040; Empl.: 35; *Sls. Mgr.:* Bernard W. Mandel

MEDA, INC., Macintyre Electronics Design Assocs., 11260 Roger Bacon Dr., Ste. 202, Reston, VA 22090, Tel: 703-471-1445; Empl.: 8

MEDIA RECOVERY INC., Box 1407, Graham, TX 76046, Tel: 800-527-9497, 214-630-9625 (Texas), TELEX: 73-2561; Empl.: 130; *Sls. Mgr.:* J. Ricciardi

MEISSNER INDUSTRIES, 551 Rte. 10, Dover, NJ 07801, Tel: 201-366-1700; Empl.: 10

MELCHER®

FAX: 508-879-8669

MELCHER, INC., Melcher A.G., 200 Butterfield Dr., Ashland, MA 01721, Tel: 508-881-4715, TWX: 5101003630; Empl.: 110; *Sls. Mgr.:* Richard Sakakeeny ..... **D•1910-1911**

Local Sales Offices & Reps

AL	Huntsville, Over & Over Inc.	205-837-7105
AZ	Phoenix, Blackhart & Assocs.	602-893-3488
CA	Huntington Beach, Mil-Com Sls., Inc.	714-840-2424
CA	Los Altos, PEI Assocs.	415-968-4409
CA	Santa Clara, Sourcetronics	408-988-8801
CO	Englewood, Taylor Mktg.	303-850-0207
FL	Altamonte Springs, Over & Over Inc.	305-332-1222
FL	Tampa, Over & Over Inc.	813-626-9100
GA	Norcross, Over & Over Inc.	404-449-6205
IL	Arlington Hgts., Phoenix Elctrn. Sls.	312-394-4422
IA	Des Moines, The Beams Co.	515-255-1148
MD	Hunt Valley, Eagle Sls. Corp.	301-666-3930
MA	Whitinsville, Power Factor & Assocs.	508-234-9878
MA	Whitinsville, Power Factor & Assocs.	617-234-6415
MI	Troy, CB Jensen & Assocs.	313-643-0506
NJ	Englewood, Technimat	201-569-4200
NC	Charlotte, Over & Over Inc.	704-542-9111
NC	Raleigh, Over & Over Inc.	919-782-9111
OH	Cleveland, Bradcor Elctrns. Co.	216-671-1200
OR	Portland, Power Factor	5039292-0820
PA	Horsham, TMI	215-441-4300
TX	Richardson, Jim D. Gray & Assocs., Inc.	214-699-9976
TX	Richmond, Jim D. Gray & Assocs., Inc.	713-342-1710
UT	Ogden, Taylor Mktg.	801-546-9570
WA	Lynwood, Power Sources Unltd.	206-743-6641
WI	Oak Creek, Phoenix Elctrns. Sls.	414-764-1455

FAX: 609-393-9461

MELCOR/MATERIALS ELCTRN. PRODS., 994 Spruce St., Trenton, NJ 08648, Tel: 609-393-4178, TELEX: 84-3314; FSC No.: 32333; Empl.: 180; *Sls. Mgr.:* M.A. Levine ..... **B•1904-1905**

Local Sales Offices & Reps

CO	Fort Collins, Rep Sls., Inc./Andy Cornedi	303-226-1504
NY	Rochester, R. G. Minges Agency	716-328-3410

Distributor

MELFESS FIVE, INC., 12304 Santa Monica Blvd., No. 121, Los Angeles, CA 90025, Tel: 213-826-8133, 800-533-2297, FAX: 213-820-6958; Empl.: 4; *Sls. Mgr.:* Michael S. Fisher ..... D•1096

MELLES GRIOT, INC., 1770 Kettering St, Irvine, CA 92714, Tel: 714-261-5600, TELEX: 678447; Empl.: 110; *Sls. Mgr.:* Candi Bauccio

MEL-RAIN CONTROLS, 42974 M-43 Hwy., Paw Paw, MI 49079, Tel: 616-657-2527; FSC No.: 639; Empl.: 20; *Sls. Mgr.:* Howard F. Walter

MEMBRONICS DIVISION, Chicago Decal Company, 3310 North Elston Avenue, Chicago, IL 60618, Tel: 312-463-4007, FAX: 312-463-4065; *Sls. Mgr.:* Dick Gorney

FAX: 219-356-7376

MEMCOR-TRUOHM, INC., 1320 Flaxmill Rd., Huntington, IN 46750, Tel: 219-356-4300, TWX: 510-601-7258, ESYLNK: 62938315; FSC No.: 24681; Empl.: 250; *Sls. Mgr.:* Ray Vanderspool ..... **A•1980, 2131**

Local Sales Offices & Reps

AL	Huntsville, Murcota	205-539-8476
CA	American Canyon, Jacobson & Assoc.	707-552-4412
CA	Huntington Bch., Mil-Com Sls.	714-840-2424
FL	Indialantic, Raycom	305-727-8860
GA	Atlanta, Murcota	404-875-2525
IL	Chicago, D. Dolin Sls.	312-286-6200
IN	Ft. Wayne, Menze Sls.	219-747-5616
MI	St. Clair Shores, J.M. Thorpe	313-779-6363
MO	St. Charles, Hayes Elec. Sls. Co.	314-946-6677
NH	Atkinson, Mark Rep Assoc.	603-382-9563
NJ	Englewood Cliffs, Masin Esco	201-569-8868
NY	Hauppauge, Masin Esco	516-273-3500
NY	Marcellus, Mullahy Sls. Inc.	315-685-6280
NC	Burlington, Murcota	919-585-1577
NC	Winston-Salem, Murcota	919-723-1001
OH	Cleveland, Glover Sls.	216-842-4520
PA	Newtown Square, G.M. Conneen	215-353-2241
TX	Dallas, SW Elctrn. Ind.	214-233-9816
TX	Houston, SW Elctrn. Ind.	713-729-1670
WA	Redmond, Barrett-Squibb	206-885-6991

MEMODYNE, 200 Reservoir St, Needham Hgts., MA 02194, Tel: 617-444-7000, TELEX: 92-2537, TWX: 510-600-8774, FAX: 617-449-7023; Empl.: 40; *Sls. Mgr.:* Leonard Sacon ..... **D•1098-1100**

Local Sales Offices & Reps

AL Huntsville, Dean Assocs. 205-534-2255
AZ Scottsdale, A.M.I. 602-947-4297
CA Carson, Amasco 213-516-8561
CT Portland, BBI Elctrns. 203-342-0648
FL Orlando, DAI Sls. 305-299-7754
IL Elmhurst, Scott Assocs. 312-279-5681
MD Severna Park, Syronics 301-544-8652
MA Holbrook, McLellan Assocs. 617-767-4771
MI Detroit, EQS Sys. 313-961-3042
MI Pontiac, EQS Sys., Inc. 313-338-2280
MN Chanhassen, Jen-Ray Sys. 612-934-8607
NJ Boonton, PAF Assocs. 201-335-0680
NY Liverpool, Syronics 315-451-0968
NY Smithtown, PAF Assocs. 516-360-0940
OH Chesterland, EQS Sys. 216-729-2222
OH Columbus, EQS Sys. 614-228-3453
OH Dayton, EQS Sys., Inc. 513-236-7676
OH Huber Hgts., EQS Sys., Inc. 216-729-2222
OR Lake Oswego, Syntek 503-636-6793
PA Sellersville, Penn-Tech Sls. 215-257-2756
TX Irving, Trice Mktg. 214-255-1877
WA Kirkland, Syntek 206-488-0394

MEMORY PROTECTION DEVICES, INC., See Bogen Communications, Inc.

MEMORY X, 5205 Kearny Villa Way, No. 106, San Diego, CA 92123, Tel: 619-292-1151, FAX: 619-292-0774

MEMTRON®

FAX: 517-652-2659

MEMTRON TECHNOLOGIES, INC., 1400 Weiss St., Frankenmuth, MI 48734, Tel: 517-652-2656, 800-234-7525; FSC No.: 6 V 417; Empl.: 116; *Sls. Mgr.:* Daniel T. Ortner ..... **B•1878**

Local Sales Offices & Reps

AZ Mesa, Inmark 602-830-9104
CA San Diego, Intramerica Technlg. 619-451-3383
CA Saratoga, Edward King & Assocs. 408-867-2111
CO Boulder, R. F. Mayo 303-442-2155
FL Maitland, EIR, Inc. 305-660-9600
GA Lawrenceville, Tek-Rep Mktg., Inc. 404-963-1600
IL Wheaton, Chadra-Schilke & Assocs., Inc. 312-653-8126
IN Indianapolis, EMCI, Inc. 317-253-1668
MA Framingham, Stone Comp. Sls. Corp. 617-875-3266
MO Saint Charles, Buckman & Assocs. 314-946-6201
NY Islip, ABS Technlgs., Inc. 516-277-7010
NY Liverpool, Syronics 315-451-0968
OH Columbus, Tom Mulligan Co. 614-457-2242
PA Southampton, Campbell Assocs. 215-322-6630
TX Richardson, Zonk & Assocs. 214-238-7651, 214-895-9131
VA Alexandria, Tech-Reps. Inc. 703-370-2600
WA Federal Way, K. R. Jensen Sls. 206-874-2772
Can Toronto, Ont., Reptech 416-863-9510

MEPCO/CENTRALAB
A NORTH AMERICAN PHILIPS COMPANY

FAX: 407-881-3300

MEPCO/CENTRALAB CORP. HDQRTR., North American Philips Corporation, 2001 W. Blue Heron Blvd., Riviera Beach, FL 33404, Tel: 407-881-3200, TELEX: 136461, TWX: 810-848-0228; *Dist. Mgr.:* Jess Hall ..... **A•1120-1124, 1981-1984; B•1022-1023**

Local Sales Offices & Reps

AL Huntsville, Over & Over 205-837-7105
AZ Tempe, Mepco/Centralab 602-820-2225
CA Anaheim, Mepco/Centralab 714-441-0385
CA Harbor City, Refrigeration Comp. 213-325-3420
CA Mission Hills, Mepco/Centralab 818-891-6299
CA Mtn. View, Brooks Tech. Grp. 415-960-3880
CA Pleasanton, Mepco/Centralab 415-462-2833
CA San Diego, Mepco/Centralab 619-453-0332
CO Englewood, Mepco/Centralab 303-779-9696
FL Altamonte Springs, Mepco/Centralab 407-339-5073
FL Ft. Lauderdale, Mepco/Centralab 305-485-0115
GA Norcross, Over & Over, Inc. 404-449-6205
IL Bannockburn, GMR Sls., Inc. 312-295-8440
IL Des Plaines, Mepco/Centralab 312-827-4487
IN Ft. Wayne, Corrao Marsh, Inc. 219-482-2725
IN Greenfield, Carrao Marsh, Inc. 317-462-4446
IN Indianapolis, Leslie M. Devoe Co. 317-842-3245
IA Cedar Rapids, Lorenz Sls., Inc. 319-377-4666
KS Merriam, Lorenz Sls. 913-384-6556
MD Columbia, Delta III Assocs. 301-730-4700
MA Woburn, Mepco/Centralab 617-438-6050
MI Farmington Hills, Mepco/Centralab ... 313-553-6010
MN Minneapolis, Electric Comps. Sls., Inc. 612-933-2594
MO University City, Lorenz Sls. 314-997-4558
NE Lincoln, Lorenz Sls. 402-475-4660
NJ Englewood Cliffs, Ed Glass Assocs. ... 201-592-0200
NJ Mendham, Mepco/Centralab 201-543-2556
NY Binghamton, Empire Tech. Assocs. ... 607-772-0651
NY Skaneateles, Empire Tech. Assocs., Inc. 315-685-5703
NC Charlotte, Over & Over, Inc. 704-542-9111
NC Raleigh, Over & Over 919-782-9111
OH Dayton, Mepco/Centralab 513-436-0066
OH Wickliffe, Mepco/Centralab 216-731-7721
OR Beaverton, Eclipse Mktg. Grp. 503-642-1661
PA Narberth, Bresson Assocs. 215-664-6460
TX Austin, Mepco/Centralab 512-331-8828
TX Richardson, Mepco/Centralab 214-231-8274
WA Redmond, Eclipse Mktg. Grp. 206-885-6991
WA Spokane, Eclipse Mktg. Grp. 509-922-3972
WI Milwaukee, Mepco/Centralab 414-228-4244
PR Hato Rey, M. Anderson Co. 809-751-2026
Can Montreal, PQ, Philips Elctrns. 514-342-9180
Can N. Vancouver, BC, Arwin Tech. Sls. ... 604-980-4557
Can Ottawa, Ont., Philips Elctrns. 613-722-1093
Can Pickering, Ont., Alltemp Prod. Co. 416-831-3311
Can Pickering, Ont., McHugh Elctrns. 416-831-4770
Can Scarborough, Ont., Philips Elctrns. 416-292-5161
Can Scarborough, Ont., Philips Elctrns. 416-292-8200
Can Vancouver, B.C., Philips Elctrns. 604-435-4411

MEPCO/CENTRALAB, North American Philips Corporation, 4561 Colorado Blvd., Los Angeles, CA 90039, Tel: 818-240-4880, TWX: 910-497-2282; *Sls. Mgr.:* G. Ollen ..... **A•1123, 1981; B•1022-1023**

MEPCO/CENTRALAB, North American Philips Corporation, 5900 Australian Avenue, W. Palm Bch., FL 33407, Tel: 305-842-3201, TELEX: 820677, TWX: 510-952-7631, FAX: 305-863-1811 ..... **A•1120**

MEPCO/CENTRALAB, North American Philips Corporation, 6071 St. Andrews Rd., Columbia, SC 29212-3198, Tel: 803-772-2500, TELEX: 805024, FAX: 803-772-2445; *Sls. Mgr.:* B. Cuirko ..... **A•1120-1124**

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MEPCO/CENTRALAB, North American Philips Corporation, 7158 Merchant Ave., El Paso, TX 79915, Tel: 915-779-3961, TWX: 910-964-1311, FAX: 915-775-0149; *Sls. Mgr.:* G. Ollen ..... **A•1124**

MEPCO/CENTRALAB, North American Philips Corporation, Airport Road, P.O. Box 760, Mineral Wells, TX 76067, Tel: 817-325-7871, TELEX: G.P.R.-881857/S.P.R.-820545, FAX: 817-325-7876; *Sls. Mgr.:* N. Egeland ..... **A•1981-1982, 1984; B•1022-1023**

MEP CONTROLS, Rising Sun Rd., Bordentown, NJ 08505, Tel: 609-298-7300, TWX: 510-685-3645, FAX: 609-298-1982; Empl.: 25; *Sls. Mgr.:* Thomas Thorn

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MEPCOPAL COMPANY, 11468 Sorrento Valley Rd., San Diego, CA 92121, Tel: 619-453-0332, TELEX: 62547100, TWX: 910-337-1120; Empl.: 160 ..... **A•2132-2134; B•1803**

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AL Huntsville, Over & Over, Inc. 205-837-7105
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CA Anaheim, Mepco/Centralab 714-441-0385
CA Mission Hills, Mepco/Centralab 818-891-6299
CA Mtn. View, Brooks Tech. Grp. 415-960-3880
CO Englewood, Mepco/Centralab 303-779-9696
FL Altamonte Springs, Mepco/Centralab 407-339-5073
GA Norcross, Over & Over Inc. 404-449-6205
IL Des Plaines, Mepco/Centralab 312-827-4487
IN Indianapolis, Leslie M. Devoe Co. 317-842-3245
IA Cedar Rapids, Lorenz Sls. Inc. 319-377-4666
KS Merrian, Lorenz Sls. Inc. 913-384-6556
MD Columbia, Delta III Assocs. 301-730-4700
MA Stoneham, Mepco/Centralab 617-932-4748
MI Farmington, Mepco/Centralab 313-553-6010
MN Minneapolis, Elec. Comps. 612-933-2594
MO University City, Lorenz Sls. Inc. 314-997-4558
NE Lincoln, Lorenz Sls. Inc. 402-475-4660
NY Binghamton, Empire Tech. Assocs. ... 607-772-0651
NY Rochester, Empire Tech. Assocs. 716-381-8500
NY Skaneateles, Empire Tech. Assocs. ... 315-685-5703
NC Charlotte, Over & Over Inc. 704-542-9111
OH Dayton, Mepco/Centralab 513-436-0066
OH Wickliffe, Mepco/Centralab 216-731-7721
OR Beaverton, Eclipse Mktg. Grp. 503-642-1661
PA Narberth, Bresson Assocs. 215-664-6460
TX Austin, Mepco/Centralab 512-331-8828
TX Richardson, Mepco/Centralab 214-231-8274
WA Redmond, Eclipse Mktg. Grp. 206-885-6991
WA Spokane, Eclipse Mktg. Grp. 509-922-3672
WI Milwaukee, Mepco/Centralab 414-228-4244
Can Scarborough, Ont., Philips Elctrns. 416-292-5161

Local Distributors

AL Huntsville, Hall-Mark Elctrns. 205-837-8700
AZ Phoenix, Hall-Mark Elctrns. 602-437-1200
CA Sunnyvale, Hamilton/Avnet 408-743-3355
CO Englewood, Shelley-Ragon 303-762-0670
CT Wallingford, Marshall Inds. 203-265-3822
FL Orlando, TTI, Inc. 407-859-1000
GA Norcross, Hall-Mark Elctrns. 404-447-8000
IL Chicago, Nep Elctrns. 312-595-8500
IN Indianapolis, Marshall Inds. 317-297-0483
MD Columbia, Aztech Elctrns. 301-995-6800
MA Wilmington, Marshall Inds. 508-658-0830
MI Livonia, Marshall Inds. 313-525-5850
MN St. Paul, Shelley-Ragon 612-642-2828
NE Omaha, Scott Elctrns. 402-734-6750
NJ Cherry Hill, Hamilton/Avnet 609-424-0100
NY Ronkonkoma, TTI, Inc. 516-737-2000
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MERCER ELECTRONICS, Simpson Electric Co., 853 Dundee Ave., Elgin, IL 60120, Tel: 312-697-2260, TELEX: 72-2416, FAX: 312-697-2272; *Dist. Mgr.:* George Oskandy, Sls. Admin. Mgr.

MERCURY PLASTICS, A UNIT OF ZERO CORP., 672 Fuller Rd., Chicopee, MA 01020, Tel: 413-267-5561, FAX: 413-592-5018; Empl.: 100; *Sls. Mgr.:* Roger St. Martin

MERECO PRODUCTS DIV., Metachem Resins Corp., 1505 Main St., West Warwick, RI 02893, Tel: 401-828-4550; Empl.: 100; *Sls. Mgr.:* John E. Powell, Jr.

MERET, INC., 1815 24th St., Santa Monica, CA 90404-4998, Tel: 213-828-7496, TELEX: 65-246 8 SNM, FAX: 213-828-7567; FSC No.: 53071; Empl.: 55; *Sls. Mgr.:* Jonathan Medved ..... **B•1215**

Local Sales Offices & Reps

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CO Lakewood, Technical Mktg. Mfg. Inc. .. 303-232-1516
MI Southfield, Video Concepts 313-358-2679
MO St. Louis, Engrg. Svcs. Co. 314-997-1515
NM Albuquerque, Tech. Mktg. & Mfg. 505-298-6893
IL Northrock, Emtech 312-564-2505
NY Elmsford, Metro-Tek Assocs. 914-347-4112
PA Glenside, Wyncote Instrmn. 215-572-6500
TX Dallas, The Thorson Co. 214-233-5744
VA Fairfax, Schibley Assocs.,Inc. 703-591-3008
WA Kirkland, Nycom Assocs. 206-827-4544

MERIX CHEMICAL CO., 2234 East 75th St., Chicago, IL 60649, Tel: 312-221-8242; Empl.: 15; *Sls. Mgr.:* E. O. Sonneman; *Dist. Mgr.:* E. O. Sonneman

MERRILL, INC., POB 308, 1316 Sumneytown Pike, Gwynedd Valley, PA 19437, Tel: 215-643-2116; FSC No.: 58624; Empl.: 10; *Sls. Mgr.:* J. Fournier

MERRIMAC INDUSTRIES, 41 Fairfield Pl, West Caldwell, NJ 07006, Tel: 201-575-1300, TELEX: 6853128, FAX: 201-575-0531; FSC No.: 12457; Empl.: 300

J. R. MERRITT CONTROLS, INC., 375 Fairfield Ave., Bldg., Stamford, CT 06902, Tel: 203-359-2113, TWX: 510-601-6932JRMC, FAX: 203-656-0162; *Sls. Mgr.:* Earl Atkins

MESUR-MATIC ELCTRNS., 10 Colonial Rd., Ste. 6, Salem, MA 01970-2294, Tel: 617-745-7000; Empl.: 29; *Sls. Mgr.:* Kosma L. Evangelidis

METALINK CORPORATION, P.O. Box 1329, Chandler, AZ 85244, Tel: 602-926-0797, TELEX: 4998050, FAX: 602-926-1198

METHODE ELECTRONICS, INC., 7444 W. Wilson Ave., Chicago, IL 60656, Tel: 312-867-9600, TWX: 910-221-2468, FAX: 312-867-9130; Empl.: 2000; *Sls. Mgr.:* S. Landeene

METHODE ELECTRONICS, INC., Interconnect Prods Div, 1700 Hicks Rd, Rolling Meadows, IL 60008, Tel: 312-392-3500, FAX: 312-392-9404; FSC No.: 95354; Empl.: 250; *Sls. Mgr.:* Suzi Landeene; *Dist. Mgr.:* Kathy Lindsey

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AL Huntsville, Magaro Assocs. 205-882-0827
AZ Phoenix, Louis James & Assocs. 602-992-0872
CA Orange, X. B. X. Sls. 714-998-8200
CA Santa Clara, Nelson Elctrn. 408-980-1950
CO Commerce City, Louis James & Assocs. 303-287-4657
GA Atlanta, Magaro Assocs. 404-451-8862
IL Chicago, Berndt Assocs. 312-283-0713
IN Carmel, Berndt Assocs. 317-844-0114
MI Livonia, Lowell-Wendt Mktg. 313-464-2722
MN Minneapolis, Berndt Assocs. 612-546-2021
NJ W. Caldwell, PCS 201-575-7464
NC Greensboro, Magaro Assocs. 919-294-4783
PA Jenkintown, Monument Tech. Assocs. 215-884-3737
UT Salt Lake City, Louis James & Assocs. 801-487-3851
WA Woodinville, Louis James & Assocs. .. 206-788-5228
WI Milwaukee, Berndt Assocs. 414-545-8400
Can St. Laurant, Quebec, Techmatron Inst., Inc. 514-689-5889

METRA INSTRUMENTS, INC., 1874 Lundy Ave., San Jose, CA 95131, Tel: 408-432-1110, TELEX: 296698; Empl.: 60; *Sls. Mgr.:* Douglas J. Stock

METRAPLEX CORP., 5305 Spectrum Dr., Frederick, MD 21701, Tel: 301-662-8000, TELEX: 697-4248 MPX CORP, FAX: 301-695-8099; Empl.: 105

METRIC SYSTEMS, 645 Anchors St., Ft. Walton Beach, FL 32548-9990, Tel: 904-244-9600, TELEX: 70-2447; FSC No.: 12339; Empl.: 700

METRIX INSTRUMENT CO., 1711 Townhurst, Houston, TX 77043, Tel: 713-461-2131, TELEX: 77-5486, FAX: 713-461-8223; Empl.: 50; *Sls. Mgr.:* W. B. Brown

METROLAB INSTRUMENTS SA, 6, Chemin du Clos, Geneva (Lancy), Switzerland CH-1212, Tel: (41-22)794 11 21, TELEX: 41-22-794 11 20

METRON OPTICS INC., P.O. Box 690, Solana Beach, CA 92075-0690, Tel: 619-755-4477, FAX: 619-755-4752; Empl.: 22

METROPOLE PRODUCTS INC., P. O. Box 309, Stafford, VA 22554, Tel: 703-659-2132, 703-971-7082, FAX: 703-659-2133; FSC No.: 55908; *Sls. Mgr.:* John DePaola

METROSONICS, INC., Box 23075, Rochester, NY 14692-3075, Tel: 716-334-7300, TELEX: 853348, FAX: 716-334-2635; FSC No.: 55381; Empl.: 80; *Sls. Mgr.:* R. Branch; *Dist. Mgr.:* S. Macioulis

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FAX: 201-679-3222

METUCHEN CAPACITORS, INC., 139 White Oak Ln., P.O. Box 499, Old Bridge, NJ 08857, Tel: 201-679-3366, TWX: 710-998-0892; FSC No.: 55969; Empl.: 25; *Sls. Mgr.:* George Wolter ..... **A•1126-1133, 1706-1707; C•1442-1445**

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MF ELCTRNS. CORP., 10 Commerce Dr., New Rochelle, NY 10801, Tel: 914-576-6570, TWX: 710-563-0643; FSC No.: 08111; Empl.: 100; *Sls. Mgr.:* Zaw Nawaday; *Dist. Mgr.:* Frank Aliberga ..... **A•1426-1427**

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CO Denver, Matthews & Assocs. 303-450-6476
CT Meriden, Orion Group 203-621-8371
FL Tampa, SRT Mktg. 813-884-4805
MA Wakefield, The Orion Group 617-245-5220
MN Edina, Peterson Sls. & Assoc. 612-944-0030
NC Raleigh, Tingen Tech. Sls. 919-878-4440
OR Portland, Core II 503-641-0877
PA Prospect Park, ELF Sls. 215-534-3340
TX Dallas, Matthews & Assocs. 214-248-7881
WA Seattle, Core II Mktg. 206-467-0622

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CA Sunnyvale, Pacesetter 408-734-5470
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NY Bohemia, RBD Elec. 516-589-7717
NY Cen. Islip, Domino Comps. 609-931-5303
NY Mt. Vernon, Janesway Elec. 914-699-6710

MFG, Parabam Div., 1130 Watsoncenter Rd., Carson, CA 90745, Tel: 213-549-5044; Empl.: 85

MFI, 12304 Santa Monica Blvd., Ste. 121, Los Angeles, CA 90025, Tel: 213-826-8133, 800-533-2297, FAX: 213-820-6958

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FAX: 516-467-5176

MFM TECHNOLOGY, INC., Affiliate of Unitrode Corp., 200 Thirteenth Ave., Ronkonkoma, NY 11779, Tel: 516-467-5151, TELEX: 221-500ASAS; Empl.: 25 ..... **B•1279**

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CO Denver, Koenig Engrg. 303-799-6616
NY Plainview, Motion Control Sls. 516-756-5656
NJ Princeton, Assocd. Controls Inc. 609-799-7020
OH Toledo, Cubbedge Controls, Inc. 419-535-5530
OR Portland, ControlTek, Inc. 503-641-0876
CA Alhamba, C. E. Mello Co. 818-282-2000
CA San Jose, Motion Control-North 408-997-0544

MG ELECTRONICS

FAX: 516-582-3229

MG ELECTRONICS, 32 Ranick Rd., Hauppauge, NY 11788, Tel: 516-582-3400; Empl.: 14; *Sls. Mgr.:* John Kibbit; *Dist. Mgr.:* Stan Grey ..... **D•1043**

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MICHIGAN MAGNETICS, 203 W. Third St., Vermontville, MI 49096, Tel: 517-726-0590, FAX: 517-726-0078; Empl.: 50; *Sls. Mgr.:* Tom Krul

MICREL SEMICONDUCTOR, 560 Oakmead Parkway, Sunnyvale, CA 94086, Tel: 408-245-2500, TWX: 910-379-0007, FAX: 408-245-4175; FSC No.: 60496; Empl.: 135; *Sls. Mgr.:* Steve Kelly

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MICROBAR SYSTEMS, INC., 785 Lucerne Drive, Sunnyvale, CA 94086, Tel: 408-720-9300, TWX: 910-373-2047; *Sls. Mgr.:* W. Barrett Burton

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MICROCHIP TECHNOLOGY INC., Sub. of General Instrument Corp., 2355 W. Chandler Blvd., Chandler, AZ 85224, Tel: 602-963-7373, TWX: 910-950-1963, FAX: 602-899-9210; *Sls. Mgr.:* Phil Hubbert

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MICRO-CIRCUITS CO., INC., 10792 Maublin Rd., New Buffalo, MI 49117, Tel: 616-469-2727, FAX: 616-469-2742 ..... **C•1123**

MICRO-COAX COMPONENTS, INC., a UTI Company, Box E, Collegeville, PA 19426, Tel: 215-489-3700, FAX: 215-489-1103; Empl.: 50; *Sls. Mgr.:* Lloyd Deery

MICROCOSM, INC., 15275 S.W. Koll Parkway, Beaverton, OR 97006, Tel: 503-626-6100, TELEX: 759527 (Microcosm UD), FAX: 503-644-9906; Empl.: 30; *Sls. Mgr.:* M. L. Epperson

MICRO CRYSTAL DIVISION / SMH

FAX: 212-505-6787

MICRO CRYSTAL DIVISION, SMH, 35 E. 21st Street, New York, NY 10010, Tel: 212-505-5340, TELEX: 239 865 eta ur; *Sls. Mgr.:* Thomas Camazza; *Dist. Mgr.:* Thomas Camazza ..... **A•1429-1432**

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OH	Mt. Orab, Ben Jenn Engrg.	513-444-3175

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MICRODIMENSIONS, INC., 7345 Production Dr., Mentor, OH 44060, Tel: 216-974-8070, FAX: 216-974-1648; Empl.: 30 ..... **B•1091**

MICRODOT, INTERCONNECT SYSTEMS DIVISION, 201 Progress Dr., Montgomeryville, PA 18936, Tel: 215-699-5373, FAX: 215-699-5536; FSC No.: 91886; *Sls. Mgr.:* K. A. Neumuller

MICRODRY, INC., 7450 Hwy. 329, Crestwood, Kentucky 40014, Tel: 502-241-8933, FAX: 502-241-5907; Empl.: 14; *Sls. Mgr.:* Frank Smith

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MICRO INSTRUMENT COMPANY, 2250 Micro Pl., Escondido, CA 92025, Tel: 619-746-2010, TELEX: 882205 MICROINST ESCD, FAX: 619-746-0433; FSC No.: FSCM 24836; Empl.: 45; *Sls. Mgr.:* C. Marks (Eastern)

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MICRO LAMPS INC., 1530 Hubbard, Batavia, IL 60510, Tel: 312-879-0900; *Sls. Mgr.:* Shirley A. Jaeger

MICROMETALS, 1190 N. Hawk, Anaheim, CA 92807, Tel: 714-630-7420, TWX: 910-591-1690, FAX: 714-630-5891; FSC No.: 12856; Empl.: 70; *Sls. Mgr.:* K. Baker, Jr.

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MA	Westborough, Anchor Engrg.	617-898-2724
MI	Ypsilanti, Atwater Assocs.	313-483-2251
MN	St. Paul, Atwater Assocs.	612-572-4135
NY	Hempstead, Kahgan Sls.	516-538-2300
WI	West Bend, Atwater Assocs.	414-338-3881

MICRO MODE PRODS., 1870 John Towers Ave., El Cajon, CA 92020, Tel: 619-449-3844, TWX: 910-331-1673; FSC No.: 15907; Empl.: 55; *Sls. Mgr.:* V. DeMarco; *Dist. Mgr.:* V. DeMarco

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MICRO MO ELECTRONICS, INC., 742 2nd Ave. S., St. Petersburg, FL 33701, Tel: 813-822-2529, TELEX: 807-982; Empl.: 32; *Sls. Mgr.:* S. J. O'Neil ..... **B•1220, 1280-1283, 1966; D•2245**

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MICRONETICS, 36 Oak St., Norwood, NJ 07648, Tel: 201-767-1320, TWX: 710-991-9603; FSC No.: 54487; Empl.: 26; *Sls. Mgr.:* Dick Farrell

MICRO NETWORKS, Unitrode Corporation, 324 Clark St., Worcester, MA 01606, Tel: 508-852-5400, FAX: 508-853-8296; Empl.: 318; *Sls. Mgr.:* Skip Osgood

MICRONICS TECHNOLOGY INC., 7 Alexander Place, Glen Cove, NY 11542, Tel: 516-759-5600, FAX: 516-759-5603; *Sls. Mgr.:* John Mruz ..... **A•1433**

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CA	Palo Alto, Microwave Mktg. Assoc.	415-941-0247
CA	Westlake VL, West Tech Microwave, Inc.	818-991-9219
MD	Laurel, CSDS	301-490-3800
MA	Natick, Wayland Assocs.	508-655-6080

MICRON INDUSTRIES, 1830 N. 32nd Ave., Stone Park, IL 60165, Tel: 312-345-0788, FAX: 312-345-0047; FSC No.: 30882; Empl.: 115; *Sls. Mgr.:* Michael Kitun; *Dist. Mgr.:* Mike Kitun

MICRO-NOW INSTR. CO., INC., 8260 N. Elmwood St., P. O. Box 1488, Skokie, IL 60077, Tel: 312-677-4700, TELEX: RCA 297214-MICRO-UR, FAX: 312-677-0394; FSC No.: 33288; Empl.: 25; *Sls. Mgr.:* C. Arnow

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AL	Huntsville, W. A. Brown Instr.	205-830-9224
CA	Los Angeles, Mc Dougall/Mc Laughlin	213-477-8556
CA	Mountain View, Mark V Assoc.	415-964-6275
CO	Boulder, H. Bass Assocs.	303-499-7509
CT	Wallingford, Pat Jenks Assoc.	203-269-1741
FL	Orlando, W. A. Brown Instrs., Inc.	407-648-9660
GA	Norcross, W. A. Brown Instrs., Inc.	404-449-7160
MA	Beverly, Pat Jenks Assoc.	508-921-4600
NM	Albuquerque, IMEC	505-883-5010
NY	E. Syracuse, E.M. Tech	315-437-6410
NY	Kings Park, USTM Tech. Mktg.	516-724-1542
WA	Seattle, Datacom	206-285-2525

FAX: 818-358-6478

MICRO-OHM CORP., 1088 Hamilton Rd., Duarte, CA 91010, Tel: 818-3575377, TWX: 910-587-3425; FSC No.: 20940; Empl.: 109; *Sls. Mgr.:* Chas. Schwab; *Dist. Mgr.:* Chas. Schwab ..... **A•1986-1990; B•1907**

Local Sales Offices & Reps

AL	Huntsville, Remco	205-533-3763
AZ	Phoenix, Toward Engrg.	602-955-3193
CA	Houma, Terrebonne Gauge House	504-851-7871
CA	Laguna Hills, Cravins Assoc.	714-240-7242
CA	San Diego, Cerco	619-450-1754
CA	San Juan Capistrano, Craven & Assocs.	714-240-7242
CO	Denver, William Purdy Co.	303-790-2211
CO	Englewood, Wm. J. Purdy Co.	303-790-2211
IL	Lake Bluff, R & R Mktg. Assocs.	312-295-6600
MA	Canton, N E E S Co.	617-828-4835
MN	Maple Grove, Elctm. Prods. For Ind.	612-784-5554
OH	Cleveland, Jim Finnigan & Co.	216-238-5905
OH	Vandalia, JFCO	513-890-8322
OK	Tulsa, Hugh J. Daly Co.	918-494-7711
OR	Beaverton, P.M.S.	503-641-9373
OR	Beaverton, Pacific Mktg. Specialists, Inc.	503-641-9373
TX	Austin, Sage Mktg.	512-335-0300
EXP	Herzlia, Israel, RelCom	922-34254

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CA	Canoga Park, Myco-Vickers	213-340-2025
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NH	Hampstead, Astrum Elctms.	603-329-5656
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OH	Toledo, J R Inds.	419-865-1408
PA	McKean, Advacom	814-476-7774
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MD	Ellicott City, V.P.I.	301-461-2525
MA	Lexington, O'Sullivan & Murphy	617-862-6570
NJ	Glen Gardner, F & M Tech. Sls.	201-832-7216
NY	Liverpool, R & D Assocs.	315-457-0100
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TX	Dallas, Gamma Opt	214-783-4758

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CO	Englewood, Omega, Ltd.	303-762-1921
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FL	Tampa, Over & Over, Inc./FL	813-626-9100
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IN	Fishers, R & D Elctrn. Sls.	317-849-2026
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KS	Lenexa, AEM, Inc.	913-888-0022
MD	Baltimore, Burgin-Kreh Assocs.	301-265-8500
MA	Reading, Meco, Inc.	617-944-6660
MN	Minnneapolis, RK Sales	612-571-1001
MO	St. Louis, AEM, Inc.	314-298-9900
NJ	Englewood Cliffs, E. Glass Assocs.	201-592-0200
NM	Albuquerque, C.T. Carlberg & Assocs.	505-836-1448
NY	Marcellus, Mullahy-Welch Sls.	315-673-3891
NY	Rochester, J.G. Welch Assocs.	716-244-1100
NC	Charlotte, Over & Over	704-542-9111
NC	Raleigh, Over & Over Inc.	919-782-9111
OH	Columbus, John O. Olsen Co.	614-478-9911
OH	Garfield Heights, J.O. Olsen	216-662-3454
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NM Albuquerque, Walker Elctrn. Supp. 505-883-2992
NY Buffalo, Summit Distrs. 716-887-2800
NY Johnson City, Help Elctrns. 607-729-3528
NY Lynbrook, Peerless Radio 516-593-2121
NY Rochester, Summit Distrs. 716-334-8110
NC Raleigh, Southeastern Elctrns. 919-828-2311
OH Dayton, J.A. Becker Co. 513-226-1341
PA McKeesport, Barno Radio Co. 412-751-5971
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UT Bountiful, Herb Bass Assocs. 801-295-7100
VA Alexandria, Vanguard Engrg. 703-768-1660
WA Seattle, J.J. Assocs. 206-246-6619
Can Montreal, RF Microwave Ltd 514-335-2335

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PA Ambler, Beta Sls. 215-641-9776

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IA Cedar Rapids, Marsland Assocs., Inc. 319-364-1575
MI Warren, Dietrich & Assocs. 313-751-4990
MN Minneapolis, Marsland Assocs., Inc. 612-545-4481
MO St. Louis, Marsland Assocs., Inc. 314-991-1399
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NM Albuquerque, Westahl Assocs. 505-881-0995
NY Huntington, C.R. Mayer Co. 516-WA1-7876
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PA Pittsburgh, Dietrich & Assocs. 412-892-2992
WA Seattle, Eicher-Richards Co. 206-LA3-7888
WI New Berlin, Marsland 414-786-6611

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GA Norcross, Twentieth Century Mktg. 404-446-1999
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PA	McKean, Advacom	814-476-7774
PA	Philadelphia, Hall-Mark	609-235-1900
PA	Pittsburg, CMD	412-678-6020
SC	Greenville, Newark	803-288-9610
TN	Memphis, Newark	901-365-8060
TX	Dallas, Control Design Supp.	214-358-1441
TX	Dallas, Force-Heiland	214-247-9955
TX	Dallas, Hall-Mark	214-553-4300
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TX	Houston, Hall-Mark	713-781-6100
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CA	Saratoga, Testco	408-253-1900
CA	Westminster, West Elctrns.	714-898-0120
GA	Norcross, Glen White Assoc.	404-441-1447
IL	Chicago, D. Dolin Sls.	312-286-6200
IN	Ft. Wayne, TMC Corp.	219-432-5553
MD	Timonium, Glen White Assoc.	301-252-6360
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NJ	West Cauldwell, Grimm, Siegel Assoc.	201-575-9300
NC	Raleigh, Glen White Assoc.	919-787-7023
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MILLIFLECT, 37444 Sycamore St., Bldg. A, Newark, CA 94560, Tel: 415-791-5188, TELEX: 466465, FAX: 415-791-5237; FSC No.: 52426; Empl.: 39; *Sls. Mgr.:* Don Koijane; *Dist. Mgr.:* Alex Nilva

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MA	Needham, Addelco, Co.	617-444-4754
NY	Fayetteville, Martin P. Andrews	315-637-5291
OH	Cleveland, Emil F. Kirik & Assocs.	216-581-7722
TX	Houston, Scientific Sls.	713-460-9170
TX	Richardson, Sci. Sls.	713-645-6218
VA	Fairfax, CSDS Inc.	703-385-0139
Can	Downsview, Ont., Tradeport Elctrns. Grp.	416-736-0866

MILL-MAX MANUFACTURING CORP., P.O. Box 300, Oyster Bay, NY 11771-0300, Tel: 516-922-6000, TWX: 510-221-1820, FAX: 516-922-9253; FSC No.: 3N087; Empl.: 200; *Sls. Mgr.:* Richard M. Weiner ..... **C•1447-1449**

Local Sales Offices & Reps

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CA	Dana Point, Patrick Conahan Assocs.	714-493-9822
CA	San Jose, Patrick Conahan Assocs.	408-723-2200
CO	Boulder, R. G. Entprs.	303-447-9211
CT	Hartford, Olsen Tech. Sls.	203-728-3229
FL	Boca Raton, Sales Specialists	407-391-3717
GA	Norcross, Elctrn. Sls., Inc.	404-448-6554
IL	Palatine, Houlihan Sls. Co.	312-705-0400
LA	Chalmette, Erickson Sls., Inc.	504-271-1976
ME	Kittery, Olsen Tech. Sls.	207-439-0280
MA	Scituate, Olsen Tech. Sls.	617-545-5101
MN	St. Paul, Johnson Co.	612-641-1878
MO	St. Louis, KKB & Co.	314-647-2400
NY	Bethpage, JSA Sls.	516-939-0844
NC	Cary, Elctrn. Sls., Inc.	919-467-8486
OH	Beachwood, Elctrn. Salesmasters	216-831-9555
OR	Milwaukie, Comtec	503-654-6626
PA	Doylestown, G. A. Recentio Assocs.	215-348-7577
TX	Dallas, Erickson Sls., Inc.	214-739-5833
WA	Bellevue, Comtec	206-453-1188

Local Distributors

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AZ	Phoenix, Arizona Comps. Co.	602-269-5655
AZ	Tempe, Acacia/VWR Elctrns.	602-894-2874
AZ	Tempe, DC Elctrns. Supp. Inc.	602-438-1234
AZ	Tempe, Elctrn. Hardware	602-967-1691
AZ	Tucson, Pioneer Screw & Nut	602-623-9800
AR	Little Rock, Carlton-Bates Co.	501-562-9100
CA	Anaheim, Bisco Inds.	714-635-0380
CA	Campbell, Gourmet Elctrns.	408-374-0552
CA	Chatsworth, West Valley Inds.	818-700-0700
CA	City of Industry, Ital Elctrn. Sls.	714-990-0922
CA	Costa Mesa, Eric Elctrns.	714-751-1185
CA	Fremont, Alatec Prods.	415-657-7701
CA	Irvine, Kelex Elctrns.	714-863-1230
CA	Mission Hills, Coast Air	818-898-2288
CA	N. Hollywood, Alatec Prods.	818-764-5600
CA	N. Hollywood, Elctrn. Hardware	818-982-6100
CA	San Jose, Bisco Inds.	408-946-8980
CA	San Jose, Eric Elctrns.	408-432-1111
CA	San Jose, Pro Fasteners	408-943-9177
CA	Santa Clara, DC Elctrns. Supp.	408-980-1199
CA	Sunnyvale, Power Supp. Comps.	408-737-1333
CA	Tustin, DC Elctrns. Supp.	714-259-9066
CO	Denver, Hardware Specialty Co.	303-371-8553
CT	Danbury, Heilind Elctrns.	203-797-8600
FL	Sanford, Elctrn./Fasteners	407-321-4000
GA	Norcross, Atlanta Hardware Specialty	404-449-3000
IL	Addison, Belford Elctrns., Inc.	312-691-1100
IL	Franklin Park, Bisco Inds.	312-451-1230
IN	South Bend, PEI/Genesis Elctrns.	800-348-2996
LA	Shreveport, Carlton-Bates Co.	318-636-9975
MD	Gaithersburg, Capital Fasteners	301-948-9310
MA	Canton, EPC Elctrns., Inc.	617-821-2111
MA	Marlborough, Hardware Specialty Co.	508-481-8622
MA	Middleboro, Glynn Elctrns., Inc.	617-947-4262
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MA	Wilmington, Heilind Elctrns.	617-657-4870
MA	Winchester, Rush Inds., Inc.	617-729-5800
MI	Grand Rapids, S.F. Elctrns. Supp.	616-459-0216
MN	Minneapolis, Aero-Space Computer Supps.	612-884-4725
MO	Bridgeton, Alatec Prods.	314-298-0010
MO	Springfield, Carlton-Bates, Co.	417-862-1699
NH	Atkinson, Astrum Elctrns., Inc.	603-898-3399
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NC	Raleigh, Century Fasteners	919-787-1800
OH	Warren, REM Elctrns.	216-373-1300
OK	Tulsa, Carlton-Bates Co.	918-250-1626
OK	Tulsa, Radio, Inc.	918-587-9123
OR	Beaverton, Acacia/VWR Elctrns.	503-646-3377
OR	Beaverton, Component Resources	503-641-8488
PA	McKean, Advacom	814-476-7774
PA	Philadelphia, PEI/Genesis Elctrns.	800-523-0727
SC	Taylors, Cantrell Whsl. Prods.	803-268-1194
TN	Memphis, Carlton-Bates, Co.	901-365-3539
TX	Carrollton, Connec/Tek, Inc.	214-245-1266
TX	El Paso, Ideal Indl. Supp.	915-779-6647
TX	Farmers Branch, Force Elctrns.	214-247-9955
TX	Houston, Wofford Elctrns.	713-847-3583
UT	Salt Lake City, Standard Supp. Co.	801-486-3371
Can	Mississauga, Ont., Rush Elctrns.	416-677-7280

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MA Waltham, Dynasel Assocs. 617-890-6777
OR Gaston, SPS Elctrns. 206-323-4140
TX Houston, Ev Smith Co. 713-649-5756
WA Seattle, SPS Elctrns. 206-323-4140

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FL Ft. Lauderdale, Jaro Elctrns. 800-327-5551
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PA McKean, Advacom 814-476-7774

MILTOPE BUSINESS PRODUCTS, Miltope Grp., 1770 Walt Whitman Rd., Melville, NY 11747, Tel: 516-420-0200, 516-756-7650, TWX: 510-221-1803, FAX: 516-756-7606; Empl.: 650

MILTOPE CORP., 1770 Walt Whitman Rd., Melville, NY 11747, Tel: 516-420-0200, TWX: 510-221-1803; Empl.: 750; *Sls. Mgr.:* Frederick S. Korb; *Dist. Mgr.:* William Jennings

MILWAUKEE ELECTRONICS, 7817 W. Clinton Ave., P.O. Box 23765, Milwaukee, WI 53223, Tel: 414-358-4000, FAX: 414-358-4001; FSC No.: 98664; Empl: 60; *Sls. Mgr.:* James Scholler

MRC

FAX: 414-271-9876

MILWAUKEE RESISTOR CORP., 700 W. Virginia St., Milwaukee, WI 53204, Tel: 414-271-9900; FSC No.: 82807;15109; Empl.: 65; *Sls. Mgr.:* W. R. Pollock; *Dist. Mgr.:* W. R. Pollock ..... **A•1992-1996**

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NY Rochester, Gislason Sls. 716-328-7400
NY Whitestone, M. H. Lynn co. 718-352-9233
OH Westlake, Assocd. Elctrl. Comps. 216-835-9960
TN Memphis, Cartwright & Bean 901-362-8345

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CA Hayward, Liaison, Inc. 415-783-1131
CO Denver, West Inc. 303-477-8180
CT Old Saybrook, FJS Assocs. 203-388-5374
FL Orlando, Delmac 305-831-0040
GA Atlanta, L & D, Inc. 404-395-7079
MI Grand Rapids, Midwest Meridian 616-698-7391
IA Cedar Rapids, J.R. Sls. Engrg. 319-393-2232
MD Ellicott City, Eastern Tech Corp. 301-461-7720
MA Burlington, F.J.S. Assocs. 617-273-5959
MN Minneapolis, TWC Sls. 612-636-1770
MO St. Louis, Midwest Meridian 314-878-4441
NJ Hasbrouck Hgts., Comp-Tech Sls. 201-288-7400
NY Syracuse, J. R. Costello 315-472-0322
NC Greensboro, L & D, Inc. 919-292-3201
OH Cleveland, Jim Finnegan & Co. 216-238-5905
PA Downingtown, McCoy, Inc. 215-363-0350
TX Fort Worth, CMR 817-379-6540
WA Bellevue, Caruso & Co. 206-455-8811
Can Rexdale, Ont., Myelco, Inc. 416-674-1636

MINIATURE METAL FORMING DIV., 4819 Emerald St., P.O. Box 2962, Torrance, CA 90509, Tel: 213-370-3679, FAX: 213-370-5430; Empl.: 35; *Sls. Mgr.:* Fred Kramer

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FAX: 718-332-4661

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CA Los Altos, Cain-White & Co. 415-948-6533
CA Tustin, Youngewirth & Olenick Assocs. 714-838-5144
CO Aurora, Thorson Desert States, Inc. ... 303-671-7344
FL Clearwater, Beacon Elctrns. 813-796-2378
FL Longwood, Beacon Elctrns. 407-332-1940
GA Atlanta, Beacon Elctrns. 404-256-9640
IL Mt. Prospect, Cain-Forlaw Co., Inc. 312-253-3578
MD Columbia, M. Lader Co. 202-296-2497
MA Waltman, Scientific Dvcs. 617-890-2252
NM Albuquerque, Thorson Desert States, Inc. 505-293-8555
NY Hartsdale, Spectrum Sls., Inc. 914-472-8600
NY Skaneateles, Robtron 315-685-5731
NY Skaneateles, Robtron, Inc. 315-685-5731
NC Greensboro, M. Lader Co. 919-674-8970
NC Raleigh, Beacon Elctrns 919-787-0330
NC Raleigh, Beacon Elctrns. 919-787-0330
NC Raleigh, M. Lader Co. 919-828-3870
OH Lancaster, Cain Forlaw Co. 614-654-4800
OH Lancaster, Cain-Forlaw Co., Inc. 614-654-4800
OK Tulsa, Beacon Elctrns. 918-622-1494
PA Conshohocken, M. Lader Co. 215-825-3177
PA Lafayette Hill, M. Lader & Co. 215-825-3177
TX Austin, Beacon Elctrns. 512-345-3543
TX Dallas, Beacon Elctrns. 214-437-1505
UT Salt Lake City, Thorson Rocky Mtn., Inc. 801-973-7969
WA Bellevue, Cain-White & Co. 206-462-2118
PR Santurce, Beacon Elctrns. 809-728-5040
Can Brockville, Ont., R.F. Specialists 613-345-2343
Can Ottawa, Ont., Giga-Tron Assocs., Ltd. 613-225-4000
Can Vancouver, B.C., Penstock/Canada ... 604-662-3475

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AL Huntsville, Component Distrs., Inc. 205-883-7501
AZ Scottsdale, Spirit Elctrns 800-543-8696, 602-998-1533
AZ Scottsdale, Spirit Elctrns. 602-998-1533
AR Little Rock, Comp. Distrs., Inc. 501-227-6278
CA N. Hollywood, Crown Elctrns. 213-877-3550
CA Sunnydale, Penstock/West 408-730-0300
CA Sunnydale, Penstock, Inc. 408-730-0300
CA Sunnyvale, Penstock, Inc. 408-730-0300
CO Aurora, Spirit Distrs. 303-671-7344
CO Aurora, Spirit Elctrns. 303-671-7344
FL Melbourne, Comp. Distrs., Inc. 305-724-9910
FL Melbourne, Component Distrs., Inc. ... 407-724-9910
GA Norcross, Comp. Distrs., Inc. 404-441-3320
GA Norcross, Component Distrs., Inc. 404-441-3320
IL Mt. Prospect, CFC Distrs., Inc. 312-253-3578
MD Columbia, MLC Distrs. 215-825-3177
NY New Rochelle, RDI Dists. Inc. 914-632-2828
NC Greensboro, MLC Distrs. 919-674-8970
NC Raleigh, Comp. Distrs., Inc. 919-834-9465
NC Raleigh, Component Distrs.,Inc. 919-834-9465
NC Raleigh, MLC Distrs. 919-848-3253
PA Conshohocken, MLC Distrs. 215-825-3177
PA Lafayette Hills, MLC Distrs. 215-825-3177
TX Dallas, Comp. Distrs., Inc. 214-644-0373
TX Dallas, Component Distrs., Inc. 214-644-0373

MINI COMPUTER TECHNOLOGY, 696 E. Trimble Rd., San Jose, CA 95131, Tel: 408-435-1616, TWX: 910-338-2281, FAX: 408-435-2709; Empl.: 22; *Sls. Mgr.:* John P. Lazare; *Dist. Mgr.:* John P. Lazare

MINI-MAGNETICS CO., INC., 1100 Fulton Place, Fremont, CA 94539, Tel: 415-490-7500, FAX: 415-490-7502; Empl.: 45; *Sls. Mgr.:* William Fine

MSI

FAX: 508-695-6076

MINI-SYSTEMS, INC., Thick/Thin Film Division, 20 David Rd., North Attleboro, MA 02761, Tel: 508-695-0203, TWX: 710-348-0564; FSC No.: 50316; Empl.: 150 ..... **A•1997**

Local Sales Offices & Reps

TX Lewisville, C & J Assocs. 214-539-0140

MINI-SYSTEMS, INC., Electronic Package Div., 168 E. Bacon St., P.O. Box 1597, Plainville, MA 02762, Tel: 508-695-2000, TWX: 510-600-4340, FAX: 508-695-8758; *Sls. Mgr.:* Heather Edwards ..... **A•1752**

Local Sales Offices & Reps

CT Fairfield, Wexler-Court Sls. 203-334-1122
NC Raleigh, Spears & Assocs. 919-846-9711
WA Bellevue, Advanced Power Comps. ... 206-747-9127
Can Ontario, CN, Intrade Canada 613-727-1272

MINI-SYSTEMS, INC., Sunbelt Microelectronic Division, 237 Enterprise Rd., Deltona, FL 32725, Tel: 407-574-0208, FAX: 407-574-8262

MINOR RUBBER CO., INC., Ackerman St., Bloomfield, NJ 07003, Tel: 201-338-6800, 800-433-6886, FAX: 201-893-1399; *Sls. Mgr.:* Tom Fitzhenry

MISCO/MINNEAPOLIS SPEAKER CO., INC., 3806 Grand Avenue, Minneapolis, MN 55409, Tel: 612-825-1010, FAX: 612-825-7010; FSC No.: 14208; *Sls. Mgr.:* Don Ringham

MITEC ELECTRONICS, 104 Gun Avenue, Pointe Claire, Quebec, Canada H9R 3X3, Tel: 514-694-6666, TWX: 510-101-2790, FAX: 514-694-3814; FSC No.: FSCM 38494; Empl.: 100; *Sls. Mgr.:* M. Monzon

MITECH ELECTRONICS CORP., 411 Washington St., Otsego, MI 49078, Tel: 616-694-9471, FAX: 616-692-2651; Empl.: 78; *Sls. Mgr.:* Kendall Meyer

MITEL SEMICONDUCTOR, MITEL CORPORATION, 360 Legget Dr., PO Box 13320, Kanata, Ont., Canada K2K 1X5, Tel: 613-592-5630, TELEX: 053 3221, FAX: 613-592-6909; Empl.: 1000; *Sls. Mgr.:* Les Thurlow; *Dist. Mgr.:* Bill Stone

MITEQ INC., 100 Davids Drive, Hauppauge, NY 11788, Tel: 516-436-7400, TELEX: 6718148, FAX: 516-436-7430; Empl.: 210

MITRONICS, P.O. Box 2129, 4000 Palos Verdes Dr.N., Ste. 201, Rolling Hills, CA 90274, Tel: 213-377-2022

MITSUBISHI ELECTRONICS, 991 Knox Street, Torrance, CA 90502, Tel: 213-217-5732, TELEX: 06-4703-M USA LSA, TWX: 66-4787-MELA TRNC; Empl.: 423; *Sls. Mgr.:* Jerry Grimson ,Distbn.Sls.Mgr.; *Dist. Mgr.:* Bob Crooks, OEM, V.P.Sls.

MITSUBISHI ELCTRNS. AMERICA, INC., Semiconductor Div., 1050 East Arques Ave., Sunnyvale, CA 94086, Tel: 408-730-5900, TELEX: 172296, TWX: 910-339-9549, FAX: 408-749-0453; Empl.: 145; *Sls. Mgr.:* John Zucker; *Dist. Mgr.:* Bob Olszewski

MKC ELECTRONICS CORP., 9205 Quivira Road, Overland Park, KS 66215, Tel: 913-894-9711; Empl.: 26

MKS INSTRUMENTS, INC., Six Shattuck Road, Andover, MA 01810, Tel: 508-975-2350, TELEX: 94-9375, FAX: 508-975-0094; Empl.: 500

MLI INDUSTRIES, INC., 3 East Main Street, Apalachin, NY 13732, Tel: 607-754-5800, FAX: 607-625-2022; Empl.: 485; *Sls. Mgr.:* Michael T. Mackenzie

MMI-MIRCO MACHINES, INC., P. O. Box 242, Santa Clara, CA 95052, Tel: 408-727-0100, TWX: 910-338-0260; *Sls. Mgr.:* Frank J. Andezzone

MOBILE-TRONICS CO., INC., Box 1022, Tustin, CA 92680, Tel: 714-546-0884; Empl.: 2

MODULAIR, 4674 Aircenter Circle, Reno, NV 89502, Tel: 702-829-2033, FAX: 702-829-2029; Empl.: 50

MODULAR AUDIO PRODUCTS, Modular Devices, Inc., Brookhaven R & D Plaza, One Roned Road, Shirley, NY 11967, Tel: 516-345-3100, FAX: 516-345-3106; *Sls. Mgr.:* C. Liptman

MODULAR DEVICES, Brookhaven R & D Plaza, 1 Roned Rd., Shirley, NY 11967, Tel: 516-345-3100, FAX: 516-345-3106; FSC No.: 52202; Empl.: 65; *Sls. Mgr.:* C. Liptman ..... **D•1918-1919, 2235**

Local Sales Offices & Reps

AZ	Tempe, Piper Sls. Co., Inc.	602-949-0048
CA	Huntington Beach, MIL-COM Sls., Inc.	714-840-2424
KS	Leewood, Thunderbird Tech. Sls.	913-642-7220
KS	Wichita, Thunderbird Tech. Sls.	316-636-5777
MD	Linthicum, Advanced Technlg. Sls., Inc.	301-789-9360
MO	Maryland Heights, Thunderbird Tech. Sls.	314-298-8940
NM	Albuquerque, Piper Sls. Co., Inc.	505-883-9090
NY	Great Neck, F & F Metro Inc.	516-482-4080
NY	Williamsville, RPN Elctrl. Assoc.	716-881-2121
TX	Dallas, M-Rep Co.	214-484-5711
UT	Salt Lake City, Piper Sls. Co., Inc.	801-466-9336

MODULAR DEVICES INC., 4115 Spencer St., Torrance, CA 90503, Tel: 213-542-8561, FAX: 213-371-6331; Empl.: 140; *Sls. Mgr.:* A. C. Augusta

MODULAR SYSTEMS, INC., 905 Albemarle St., Charlottesville, VA 22901, Tel: 804-295-7882; Empl.: 5; *Sls. Mgr.:* H. N. Patel

MODUTEC, 920 Candia Rd., Manchester, NH 03103, Tel: 603-669-5121, TELEX: 710-366-0005, FAX: 603-622-2690; Empl.: 300

MOISTURE REGISTER PRODUCTS DIV., Aqua Measure Instrument Co., 2583 Pomona Blvd., Pomona, CA 91768-3267, Tel: 714-594-5545, TELEX: 6503137369 MRP, FAX: 714-595-1218; Empl.: 25; *Sls. Mgr.:* G. Dean Curd

MOLDCON DIV. OF CONTEX ELECTRONICS, 221 Interstate Dr., W. Springfield, MA 01089, Tel: 413-736-0371, FAX: 413-736-9716; Empl.: 200; *Sls. Mgr.:* Robert Krzynowek

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KY	Louisville, Waddle & Assocs.	502-897-6419
NC	Charlotte, QED	704-525-3053
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CO	Englewood, Molex	303-779-8321
GA	Atlanta, Molex	404-396-6120
IL	Lisle, Molex	312-969-4550
IN	Indianapolis, Molex	317-299-0099
KY	Louisville, Molex	502-245-8337
MA	Woburn, Molex	617-935-8983
MI	Troy, Molex	313-879-7400
TX	Dallas, Molex	214-931-0999

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AL	Huntsville, Time Elctrns.	205-721-1133
AZ	Chandler, Hamilton Avnet	602-961-6400
AZ	Phoenix, Force Elctrns.	602-437-1060
AZ	Tempe, Harper S.I.D.	602-967-1464
AZ	Tempe, Time Elctrns.	602-967-2000
AR	Ft. Smith, Carlton Bates	501-646-8201
AR	Little Rock, Carlton Bates	501-562-9100
AR	Pine Buff, Carlton Bates	501-535-1354
AR	Springdale, Carlton Bates	501-756-5012
CA	Anaheim, Time Elctrns.	714-937-0911
CA	Chatsworth, Hamilton Avnet	818-700-1222
CA	Chatsworth, Time Elctrns.	818-998-7200
CA	Compton, Harper S.I.D. .. 800-253-5527,	213-979-5090
CA	Costa Mesa, Avnet Elctrns.	714-754-6111
CA	Costa Mesa, Hamilton Electro Sls.	714-641-4110
CA	Culver City, Hamilton Avnet	213-558-2143
CA	El Segundo, Force Elctrns.	213-772-1324, 714-522-1324
CA	Garden Grove, Richey Impact Elctrns. Ltd. 800-227-0060,	714-895-0060
CA	Gardena, Hamilton Avnet	213-217-6700
CA	Ontario, Hamilton Avnet	714-989-4602
CA	S. San Francisco, Peters-de Laet	415-873-9595
CA	Sacramento, Hamilton Avnet	916-920-3150
CA	San Diego, Force Elctrns.	619-569-9661
CA	San Diego, Hamilton Avnet	619-571-7510
CA	San Diego, Harper S.I.D.	619-578-2500
CA	San Diego, Richey Impact Elctrns. Ltd.	619-271-4511
CA	San Diego, Time Elctrns.	619-586-1331
CA	San Jose, Force Elctrns.	408-435-1324
CA	San Jose, Harper S.I.D.	408-943-9490
CA	San Jose, Richey Western Elctrns. Ltd.	408-432-7100
CA	Sunnyvale, Hamilton Avnet	408-743-3000
CA	Sunnyvale, Harper S.I.D.	408-747-0333
CA	Sunnyvale, Time Elctrns.	408-734-9888
CA	Torrance, Time Elctrns.	213-320-0880
CO	Denver, Integrated Elctrns.	303-292-6121
CO	Englewood, Hamilton Avent	303-799-7815
CO	Englewood, Time Elctrns.	303-799-8851
CO	Wheatridge, Bell Inds.	303-424-1985
CT	Cheshire, Time Elctrns.	203-271-3200
CT	Danbury, Hamilton Avnet	203-797-2800
CT	Danbury, Heilind Elctrns.	203-797-8600
CT	Wallingford, Sager Elec. Supp. Co.	203-265-4600
FL	Ft. Lauderdale, Hamilton Avnet	305-971-2900
CA	Ft. Lauderdale, Time Elctrns.	407-484-7784
FL	Orlando, Time Elctrns.	407-841-6565
FL	St. Petersburg, Hamilton Avnet	813-573-9300
FL	Winter Park, Hamilton Avnet	407-628-3888
GA	Atlanta, Electro Air Corp.	404-351-3545
GA	Norcross, Hamilton Avnet	404-447-7523
GA	Norcross, Time Elctrns.	404-448-4448
IL	Bensenville, Hamilton/Avnet	312-860-7700
IL	Bensenville, Magnuson Elctrns.	312-595-7575
IL	Chicago, Waldom Elctrns. Inc.	312-585-1212
IL	Crystal Lake, Sub-Sem, Inc.	312-782-3954
IL	Wood Dale, Time Elctrns.	312-350-0610
IN	Carmel, Hamilton Avnet	317-844-9333
IN	Indianapolis, Gateway Megatech	317-844-3906
IA	Cedar Rapids, Hamilton Avnet	319-362-4757
KS	Overland Pk., Hamilton Avnet	913-888-8900
KY	Lexington, Hamilton Avnet	606-259-1475
LA	Shreveport, Carlton Bates	318-636-9975
MD	Baltimore, Hamilton Avnet	301-995-3500
MD	Columbus, Time Elctrns.	301-964-3090
MD	Jessup, Gateway	301-792-7527
MA	Canton, Richey/Impact Elctrns. Ltd.	617-821-1500
MA	Hingham, Sager Elec. Supp. Co.	617-749-6700
MA	Peabody, Hamilton Avnet	508-532-3701
MA	Peabody, Time Elctrns.	508-532-6200
MA	Wilmington, Heilind Elctrns.	617-657-4870
MI	Ann Arbor, Gateway Megatech	313-761-2980
MI	Grand Rapids, Gateway Megatech	616-243-8805
MI	Livonia, Gateway Megatech	313-522-4700
MI	Troy, Empire Elctrns.	313-585-8130
MN	Bloomington, Time Elctrns.	612-944-9192
MN	Minneapolis, ICI/Sterling	612-831-2666
MN	Minnetonka, Hamilton Avnet	612-932-0600
MO	Earth City, Hamilton Avnet	314-344-1200
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MO	St. Louis, Time Elctrns.	314-391-6444
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NY	Hauppauge, Time Elctrns.	516-273-0100
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NY	Syracuse, Hamilton Avnet 315-	437-2641/2541
NC	Charlotte, Time Elctrns.	704-522-7600
NC	Raleigh, Hamilton Avnet	919-878-0819
OH	Cleveland, Hamilton Avnet	216-831-3500
OH	Columbus, Gateway Megatech	614-447-0222
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OH	Dublin, Time Elctrns.	614-761-1100
OH	Solon, Hamilton Avnet	216-349-5100
OH	Westerville, Hamilton Avnet	614-882-7004
OH	Willoughby, Gateway Megatech	800-MEGATECH
OK	Oklahoma City, Carlton Bates	405-691-4446
OK	Tulsa, Carlton Bates	918-250-1626
OK	Tulsa, Hamilton Avnet	918-252-7297
OR	Lake Oswego, Hamilton Avnet	503-635-8157
OR	Portland, Radar Elec.	503-232-3404
OR	Portland, Time Elctrns.	503-684-3780
PA	King of Prussia, Time Elctrns.	215-337-0900
PA	McKean, Advacom	814-476-7774
PA	Pittsburg, Hamilton Avnet	412-281-4150
PA	Trevose, Sager Elctrns.	215-638-7491
TN	Hixson, Techni-Tronics, Inc.	615-842-0514
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TN	Nashville, Carlton Bates	615-244-3562
TX	Austin, Hamilton Avnet	512-837-8911
TX	Austin, Kent Elctrns.	512-834-1900
TX	Austin, Time Elctrns.	512-339-3051
TX	Carrollton, Time Elctrns.	214-241-7441
TX	Dallas, Force Elctrns.	214-247-9955
TX	Houston, Force Elctrns.	713-561-8644
TX	Houston, Kent Elctrns.	713-780-7770
TX	Houston, Time Elctrns.	713-530-0800
TX	Irving, Hamilton Avnet	214-550-6111
TX	Irving, Harper S.I.D.	214-621-0500
TX	Richardson, Kent Elctrns.	214-669-2600
TX	Stafford, Hamilton Avnet	713-240-7733
TX	Texarkana, Carlton Bates	214-792-6923
UT	N. Salt Lake City, Integrated Elctrns.	801-298-1869
UT	Salt Lake City, Bell Inds.	801-972-6969
UT	Salt Lake City, Hamilton Avnet	801-972-2800
UT	Salt Lake City, Time Elctrns.	801-973-8181
UT	West Valley, Time Elctrns.	801-973-8181
WA	Redmond, Hamilton Avnet	206-881-6697
WA	Redmond, Time Elctrns.	206-882-1600
WA	Richland, Radar Elec.	509-943-8336
WA	Seattle, Radar Elec.	206-282-2511

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CA Orange County, Monitor Prods. Co. ... 618-433-4510
CO Denver, Monitor Prods. 619-433-4510
CT Bloomfield, Zaslow Sls., Inc. 203-242-7781
FL Apopka, Tech Rep Assocs. 813-576-9900
FL Ft. Lauderdale, Tech Rep Assocs. 813-576-9900
FL Lake Worth, Tech-Rep Assocs. 813-576-9900
FL St. Petersburg, Tech-Rep Assocs. 813-576-9900
GA Atlanta, CSR Elctrns. 404-396-3720
MA Westboro, Zaslow Sls., Inc. 617-393-8150
MN Eden Prairie, Elctrn. Innovators 612-941-0830
NY Rochester, Ossman Assoc. 716-359-1200
NY Syracuse, Ossman Assoc. 315-437-7027
NC Raleigh, CSR Elctrns. 919-878-9200
PA Philadelphia, Monitor Prods. 904-725-4386
TN Knoxville, CSR Elctrns. 615-673-0222
TX Austin, Mil-Rep Assocs. 512-346-6331
TX Houston, Mil-Rep Assocs. 713-444-2557
TX Richardson, Mil-Rep Assocs. 214-644-6731

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AR Little Rock, Component Distrs., Inc. ... 501-227-6305
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CA San Diego, Harper SID 619-560-8545
CA San Diego, Neumann Elctrns. 619-695-3005
CA Sherman Oaks, Delay Line Distrs. 818-986-9455
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CO Wheatridge, Added Value Elctrn. 303-422-1701
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IL Bensenville, Voyager Elctrns. 312-773-4900
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TX Richardson, Harper SID 214-235-3177
VA Falls Church, Component Distrs., Inc. 703-241-8227

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MOTION SENSORS, INC., 12 Park Street, Cranford, NJ 07701, Tel: 201-925-3553, FAX: 201-925-3995; Empl.: 6; *Sls. Mgr.:* Arthur Bergman

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MOTOROLA INC.
Semiconductor Products Sector

FAX: 602-952-4002

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AL 205-830-1051
MD Hyattsville 301-577-2600
TX Houston 713-251-1291

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AL Huntsville, Hamilton/Avnet Elctrns. ... 205-837-7210
AL Huntsville, Schweber Elctrns. 205-882-2200
AL Huntsville, Time Elctrns. 205-721-1133
AZ Phoenix, Future Elctrns. 602-968-7140
AZ Phoenix, Hall-Mark Elctrns. 602-437-1200
AZ Phoenix, Hamilton/Avnet Elctrns. 602-961-6400
AZ Phoenix, Schweber Elctrns. 602-997-4874
AZ Phoenix, Wyle Labs. 602-366-2888
AZ Tempe, Bell Inds. 602-966-7800
AZ Tempe, Time Elctrns. 602-967-2000
CA Agoura Hills, Time Elctrns. Corp. 818-707-2890
CA Anaheim, Time Elctrns. 714-937-0911
CA Calabasas, Schweber Elctrns. 818-880-9686
CA Calabasas, Wyle Labs. 818-880-9000
CA Canoga Pk., Hall-Mark Elctrns. 818-716-7300
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CA Chatsworth, Future Elctrns. 818-700-0914
CA Chatsworth, Hamilton Electro Sls. 818-700-6500
CA Chatsworth, Time Elctrns. 818-998-7200
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CA Costa Mesa, Hamilton Electro Sls. 714-641-4100
CA Culver City, Hamilton Electro Sls./L.A. 213-558-2381
CA Culver City, Hamilton/Avnet Corporate 213-558-2000
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CA El Segundo, Wyle Labs. 213-322-8100
CA Gardena, Bell Inds. 213-515-1800
CA Gardena, Hamilton/Avnet 213-217-6700
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CA Irvine, Schweber Elctrns. 714-863-0200
CA Irvine, Wyle Labs. 714-863-9953
CA Los Angeles, Bell Inds. Corp. 213-826-6778
CA Ontario, Hamilton/Avnet Elctrns. 714-989-4602
CA Rocklin, Bell Inds. 916-852-0414
CA Sacramento, Hamilton/Avnet Elctrns. 916-925-2216
CA Sacramento, Schweber Elctrns. 916-929-9732
CA San Diego, Future Elctrns. 619-278-5020
CA San Diego, Hall-Mark Elctrns. 619-268-1201
CA San Diego, Hamilton/Avnet Elctrns. ... 619-571-7510
CA San Diego, Schweber Elctrns. 619-450-0454
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IN Ft. Wayne, Graham Elctrns. 219-423-3422
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TX	Austin, Wyle Distr.	512-834-9957
TX	Dallas, Pioneer Elctrns.	214-386-7300
TX	Houston, Altair	713-462-3029
TX	Houston, Pioneer	713-988-5555
TX	Houston, Wyle Laboratories	713-879-9953
TX	Richardson, Altair	214-231-5166
TX	Richardson, Bell Inds.	214-690-0466
TX	Richardson, Wyle Electric	214-235-9953
UT	Salt Lake City, Bell Inds.	801-255-9611
UT	Salt Lake City, Standard Supp.	801-486-3371
UT	Salt Lake City, Wyle Distr. Grp.	801-974-9953
VA	Herndon, Sterling Elctrns.	703-742-8400
VA	Richmond, Sterling Elctrns.	804-226-2190
WA	Bellevue, Bell Inds.	206-885-9963
WA	Kent, Pyramid Elec.	206-872-5800
WA	Redmond, Priebe Elctrns.	206-881-2363
WA	Redmond, Wyle Distr. Grp.	206-881-1150
WI	Milwaukee, Marsh Elect.	414-475-6000
WI	Waukesha, Bell Inds.	414-547-8879
Can	Brampton, Ont., Zentronics	416-451-9600
Can	Burnaby, BC, R A E Ltd.	604-291-8866
Can	Calgary, AB, Cardinal Elec. Ltd.	306-934-3443
Can	Calgary, AB, R-A-E Ltd.	403-253-8575
Can	Calgary, AB, Saynor Varah	403-255-9550
Can	Calgary, AB, Zentronics	403-295-8838
Can	Concord, Ont., R A E Ltd.	416-736-1144
Can	Dartmouth, NS, R A E Ltd.	902-465-2350
Can	Don Mills, Ont., Saynor Varah	416-445-0723
Can	Edmonton, AB, R A E Ltd.	403-451-4001
Can	Edmonton, AB, Zentronics	403-484-1669
Can	Edmonton, ALB., Cardinal Elec.	403-483-6266
Can	Moncton, NB, R A E Ltd.	506-857-8011
Can	Montreal, Que., Versatech	514-481-0196
Can	Nepean, Ont., R-A-E- Ltd.	613-226-7406
Can	Nepean, Ont., Zentronics	613-226-8840
Can	Richmond, B.C., Saynor Varah	884-273-2911
Can	Richmond, B.C., Zentronics	604-273-5575
Can	Saskatoon, SK, Cardinal Elec. Ltd.	306-934-3443
Can	Saskatoon, SK, R A E Ltd.	306-933-2888
Can	St. Laurent, QB, R-A-E Ltd.	514-335-7697
Can	Willowdale, Ontario, Electro Sonic	416-494-1666
Can	Winnepeg, MB, Zentronics	204-694-1957
Can	Winnepeg, MN, Saynor Varah	204-783-3105
Can	Winnipeg, MN, R A E Ltd.	204-786-8401

MTS SYSTEMS, Box 24012, Minneapolis, MN 55424, Tel: 612-937-4000, TELEX: 163548 MULAM DL, FAX: 214-333-3533; Empl.: 1300; *Sls. Mgr.:* Ted Beaudoin

FAX: 216-771-3068

MUELLER ELEC. CO., 1583 E. 31st St., Cleveland, OH 44114, Tel: 216-771-5225; Empl.: 156; *Sls. Mgr.:* J. E. Wisneski ..... **C•1452-1459**

Local Sales Offices & Reps

AZ	Phoenix, The Heath Grp.	602-248-9091
CA	Gardena, Ungar Sls. Assocs.	213-532-6837
CA	Mountainview, Del Bucchia/Onken	415-965-8045
GA	Buckhead, Mfg. Sls. & Mktg.	404-342-3503

IL Bensenville, Heighway Tech. Sls. 312-860-7900
IN Indianapolis, M & L Elctrns. 317-359-4742
MD Randallstown, Chesapeake Inds. 301-653-0476
MA Adams, Richard W. Bieniek Assocs. ... 413-743-4164
MA Lynnfield, Keene Sls. Co. 617-245-9400
MA Springfield, Keene Sls. Co. 413-525-1049
MI Royal Oak, Hilltronics 313-435-0920
MN Minneapolis, Boerger & Assocs. 612-561-2819
MS Hattiesburg, Mfg. Sls. & Mktg. 601-264-4755
MO St. Louis, Thomas L. Dowell & Assoc. 314-849-4234
NJ Clifton, R.O.I. Sls. Co. 201-340-1515
NJ Medford, Champion Elctrns. 609-983-0932
NY Rochester, Richard W. Bieniek 716-342-3098
OR Portland, Jud Lebrun Co. 503-244-6805
PA Pittsburgh, F. P. Yarussi Co. 412-221-1717
SC Ft. Lawn, Electronic Specialists Co. ... 803-872-4454
TN Memphis, Mfg. Sls. & Mktg. 901-377-5382
TX Austin, SW Mktg. Assocs. 512-225-8010
TX Dallas, SW Mktg. Assocs. 214-341-8631
TX Houston, SW Mktg. Assocs. 713-537-8166
Can Markham, Ont., Birde Mktg. Inc. 416-477-7722

Local Distributors

AL Lafayette, Ralph's Elctrns. 318-233-0105
AZ Tucson, Electronic City 602-622-1173
AR Little Rock, Carlton Bates Co. 501-562-9100
CA Covina, Selecta-Switch 800-722-6445
CO Denver, Ryall Elec. 303-629-7721
FL Orlando, EMSCO/Hammond 407-849-6060
IL Bensenville, Ohio Test Equip. 312-860-7900
IA Cedar Rapids, Dee Elctrns. 319-365-7551
MD Rockville, Capitol Radio Wholesale ... 301-881-2270
MA Hingham, Sager Elctrl. Supp. 617-749-6700
MI Livonia, Chelsea Inds. 313-525-1155
MN Minneapolis, Stark Elctrn. Supp. Co. ... 612-332-1325
MO Maryland Hgts., Chelsea Inds. 314-997-7709
NE Lincoln, Scott Elctrn. Supp. Corp. 402-466-8221
NJ South Hackensack, Nassor Elec. Supp. Co. 201-641-3737
NY Rochester, Masline Elec. 716-546-5373
OH Dayton, Carver Supp. 513-461-9673
PA York, York Elctrl. Supp. 717-843-9991
SC Charleston, Cameron & Barkley Co. 803-554-9550
TX Ft. Worth, Allied Elctrns. 817-265-9341
UT Salt Lake City, Kimball Elctrns. 801-328-2075
WA Seattle, Radar Elec. Co. 206-282-2511
WV Huntington, State Elec. Supp. 304-523-7491
WI Milwaukee, Marsh Elctrns. 414-475-6000
Can Downsview, Ont., Westburn Indl. Entprs. Ltd. 416-635-2950

MULTI-AMP CORP., TBG, 4271 Bronze Way, Dallas, TX 75237, Tel: 214-333-3201, TELEX: 163548 MULAM DL, FAX: 214-333-3533; Empl.: 350; *Sls. Mgr.:* Robert D. Libbey

MULTICOMP., INC., 3005 S.W. 154th No. 3, Beaverton, OR 97006, Tel: 503-626-4200, FAX: 503-643-4889; Empl.: 150 ..... **A•1125, 2362; D•1923**

MULTI-CONTACT USA, 616 Davis St, Santa Rosa, CA 95401, Tel: 707-575-7575, FAX: 707-575-7573; *Sls. Mgr.:* Walter Roberts; *Dist. Mgr.:* Walter Roberts ..... **C•1460-1462**

MULTICORE SOLDERS, Cantiague Rock Rd., Westbury, NY 11590, Tel: 516-334-7997, TWX: 510-222-5185, FAX: 516-334-7098; Empl.: 1000

MULTIPOWER, INC., MultiComp., Inc., 3005 S.W. 154th Terrace No. 1, Beaverton, OR 97006, Tel: 503-646-4700, FAX: 503-643-4889; FSC No.: 75498; Empl.: 24 ..... **A•1125, 2362; D•1923**

Local Sales Offices & Reps

OR Beaverton, MultiPower, Inc. 503-646-4700

MULTI PRODUCTS INTERNATIONAL, 218 Little Falls Rd., P.O. Box 238, Cedar Grove, NJ 07009, Tel: 201-239-8183, TELEX: 219289, FAX: 201-239-8449; Empl.: 25; *Sls. Mgr.:* LeRoy Gray ..... **A•1134, 2363; D•1924**

Local Sales Offices & Reps

CA Santa Clara, Nova Tronix 408-727-9530
CA Westminster, West Elctrn. Sls. 714-898-0120,
UT Ogden, Taylor Mktg. 801-546-9570,
FL Longwood, Elctrn. Mfgs. Agt. 305-682-1202,
GA Lawrenceville, Tek Rep Mktg. 404-963-1600
IL Des Plaines, Esco Assocs. 312-298-5310
IN Frankfort, C-S Elctrns. Sls. 317-659-1874
KS Overland Park, Electri-Rep 913-649-2168
MD Ellicott City, Eastern Tech. Corp. 301-461-7720
MA Norwood, Mac Innis Co. 617-762-8090
MI Lathrup Vl, R. C. Nordstrom & Co. 313-559-7373
MN St. Paul, Proud Inds. 612-646-9428
NJ Cedar Grove, Legtonics Assocs. 201-239-4098
NY Fairport, Hi Tec Sls. 716-223-5922,
OH Dayton, K.W. Elctrn. 513-890-2150
TX Dallas, MGR Elctrns. 214-238-5246
WA Bellevue, Eltech 206-643-4330
Can Lachine, Bytewide Mktg. 514-636-4121

MULTI-TECH SYSTEMS, INC., 2205 Woodale Dr., Mounds View, MN 55112, Tel: 612-785-3500, 800-328-9717, FAX: 612-785-9874; Empl.: 170; *Sls. Mgr.:* Thomas Heimerman; *Dist. Mgr.:* Peter Hanlon/Jan Hubbard/Jim Stacklie

MULTIWIRE DIVISION, Kollmorgen Corp., 250 Miller Place, Hicksville, NY 11801, Tel: 516-933-8300, TWX: 510-223-0639; Empl.: 500; *Sls. Mgr.:* Frank Melaccio

MUPAC CORP., Carlo Gavazzi Co., 10 Mupac Dr., Brockton, MA 02401, Tel: 508-588-6110, FAX: 508-588-0498; Empl.: 130; *Sls. Mgr.:* James L. Gallagher ..... **C•1060-1061, 1716-1717**

Local Sales Offices & Reps

AL Huntsville, Elec. Man. Assocs. 205-830-4030
AZ Tempe, Piper Sls. 602-949-0048
CA Burbank, Gemini Assocs. 818-846-2633
CA Los Alamitas, Gemini Assocs. 213-594-9618
CA San Diego, Hadden Assocs. Inc. 619-565-9444
CA Santa Clara, Interconnect Sls. Grp. 408-980-1166
CA Sepulveda, Gemini Assocs. 818-891-1000
CA Sunnyvale, Computer Modules 408-737-7727
CA Tustin, Gemini Assocs. 714-838-1675
CA West Covina, Mupac - West Coast Off. 213-960-3042
CO Longmont, Piper Sls. Co. 303-443-5337
FL Jupiter, Southern Elctrns. Sls. Co. 305-744-0028
FL Melbourne, Southern Elctrn. Sls. 407-242-9661
GA Norcross, Macro Mktg. Assocs. 404-662-5580
IL Hoffman Estates, Micro-Tex 312-382-3001
IL Hoffman Estates, Micro-Tex, Inc. 312-382-3001
IN Batesville, Applied Data Mgt. 317-257-8949
MD Baltimore, Rep-Tron 301-799-7490
MA Brockton, Mupac Corp. 508-588-6110
MI Whitmore Lake, Applied Data Mgt. 313-965-5859
MN Minneapolis, L. F. Green Assoc. 612-571-6666
MO Grandview, Digital Sys. Sls. 816-765-3337
NM Albuquerque, Piper Sls. Co. 505-883-9090
NY Great Neck, F & F Metro, Inc. 516-482-4080
NY Syracuse, Labtronics 315-455-7314
OH Cincinnati, Applied Data Mgt. 513-579-8108
OK Tulsa, Milco Mktg., Inc. 214-783-2716
OR Milwaukie, Comtec 503-654-6626
PA Norristown, RJI 215-631-1414
PA Pittsburgh, Applied Data Mgt. 412-642-4202
TX Houston, Lear Assoc. 713-488-7893
TX Richardson, Lear Assocs. 214-231-5388
TX Richardson, Milco Mktg. 214-783-2716
TX Seagoville, Delta Comps. 214-287-6333
UT Salt Lake City, Piper Sls. 801-466-9336
WA Bellevue, Comtec 206-453-1188
WI Waukesha, Micro-Tex, Inc. 414-542-5352
Can Ontario, Indl. Computer Prods. 416-849-1681

MURATA ERIE NORTH AMERICA, INC., 2200 Lake Park Dr., Smyrna, GA 30080, Tel: 404-436-1300, TELEX: 54-2329, TWX: 810-766-1531, FAX: 404-436-3030; Empl.: 1800; *Sls. Mgr.:* Jack Driscoll; *Dist. Mgr.:* Kenneth O'Connor ..... **A•1135-1139, 1440-1441, 1708-1709, 1852, 1998-1999, 2135-2137; B•1967; D•1044-1046**

Local Sales Offices & Reps

AL Madison, Jack Harvey & Assoc., Inc. .. 205-461-8591
AZ Scottsdale, Thom Luke Sls. 602-941-1901
CA Chatsworth, Murata Erie 818-701-9702
CA El Toro, English/Damco Sls. Co. 714-837-3801
CA Los Altos, Recht Assocs. 415-964-6321
CA San Diego, Harvey King, Inc. 619-587-9300
CA Tustin, Murata Erie 714-832-9972
CO Boulder, Front Range Mktg. 303-443-4780
FL Clearwater, Glen White Assocs. 813-726-0577
FL Ft. Lauderdale, Glen White Assocs. ... 305-977-5885
FL Maitland, Murata Erie 407-644-0954
GA Norcross, Jack Harvey & Assocs. 404-449-4643
IL Park Ridge, Metcom Assoc. Corp. 312-696-1490
IN Indianapolis, Jack Harvey & Assocs., Inc. 317-872-1031
IN Kokomo, Jack Harvey & Assoc., Inc. .. 317-453-4260
IA Cedar Rapids, C-Tron, Inc. 319-373-2029
KS Olathe, C-Tron, Inc. 913-829-0073
KY Prospect, Jack Harvey & Assoc., Inc. .. 502-228-4100
MD Baltimore, Glen White 301-321-7235
MD Baltimore, Murata Erie 301-494-0405
MD Columbia, Murata Erie 301-992-6612
MA North Adams, Jack Harvey & Assoc., Inc. 413-664-9993
MA Wakefield, Murata Erie 617-245-7880
MA Westwood, Apex Assocs. 617-326-5042
MI Allendale, Jack Harvey & Assoc., Inc. 616-895-5605
MI W. Bloomfield, Jack Harvey & Assoc., Inc. 313-737-9122
MN Minneapolis, Stan Clothier Co., Inc. 612-944-3456
MO St. Charles, C-Tron, Inc. 314-928-8078
NJ Springfield, Radix, Inc. 201-467-4970
NY Fairport, Technology Sls., Inc. 716-223-7500
NC Raleigh, Glen White Assoc. 919-848-1931
OH Dayton, KW Electrn. Sls., Inc. 513-890-2150
OH Shaker Hgts., KW Elctrn. Sls., Inc. 216-491-9177
OR Beaverton, Murata Erie 503-646-4973
PA Allison Park, KW Elctrn., Inc. 412-487-4300
TN Knoxville, Jack Harvey & Assoc., Inc. 615-524-7057
TX Austin, RAM Elec. Sls., Inc. 512-345-2982
TX Richardson, RAM Elec. Sls., Inc. 214-669-9911
UT Midvale, Front Range Mktg. 801-566-2500
VA Lynchburg, Glen White Assocs. 804-385-6110
WA Kirkland, Murata Erie 206-827-8282
WI West Allis, Metcom Assoc. Corp. 414-476-1300
PR Hato Rey, Semtronic Assocs., Inc. 809-766-0700

Local Distributors

AL Huntsville, Time Elctrns. 205-721-1133
AZ Phoenix, Future Elctrns. 602-968-7140
AZ Phoenix, Sterling Elctrns. 602-268-2121
AZ Tempe, Acacia Sls./Deanco 602-894-2874, 602-882-9054
AZ Tempe, Time Elctrns. 602-967-2000
CA Agoura Hills, Time Elctrns. 818-707-2890
CA Amarillo, Milgray Elctrns. 805-484-4055
CA Anaheim, Time Elctrns. 714-937-0911
CA Chatsworth, Future Elctrns. 818-772-6240
CA Chatsworth, Passive Technlg. 818-882-2277
CA Chatsworth, Time Elctrns. 818-998-7200
CA Garden Grove, Natl. Elctrns. Corp. 714-892-7749
CA Inglewood, Newark Elctrns., Inc. 213-671-7377
CA Irvine, Acacia Sls./Deanco 213-971-2428, 714-660-0834
CA Irvine, Future Elctrns. 714-250-4141
CA San Diego, Acacia Sls./Deanco 619-565-4365
CA San Diego, Future Elctrns. 619-278-5020
CA San Diego, Time Elctrns. 619-586-1331
CA San Jose, Future Elctrns. 408-434-1122
CA San Jose, Future Elctrns. 408-434-1114
CA San Jose, Passive Technlg. 408-435-5566
CA Sunnyvale, Acacia Sls./Deanco 408-745-7200, 916-442-5300
CA Sunnyvale, Capsco Sls., Inc. 408-734-3020
CA Sunnyvale, Time Elctrns. 408-734-9888
CA Torrance, Time Elctrns. 213-320-0880
CO Denver, Newark Elctrns. 303-757-3351
CO Englewood, Sterling Elctrns. 303-792-3939
CO Englewood, Time Elctrns. 303-799-8851
CO Lakewood, Acacia Sls./Deanco 303-232-2882
CO Westminister, Future Elctrns. 303-421-0123
CT Cheshire, Time Elctrns. 203-271-3200
CT Milford, Milgray Elctrns. 203-878-5538
CT Wallingford, Cronin Elctrns. 203-265-3134
FL Ft. Lauderdale, Time Elctrns. 305-484-7778
FL Orlando, Time Elctrns. 407-841-6565
FL Winter Park, Milgray Elctrns. 407-647-5747
GA Norcross, Milgray Elctrns. 404-446-9777
GA Norcross, Spectrum Elctrns. 404-448-1516
GA Norcross, Time Elctrns. 404-448-4448
IL Arlington Hgts., Milgray Elctrns. 312-253-1212
IL Chicago, Newark Elctrns. 312-784-5100
IL Elk Grove Village, Goold Elctrns. Corp. 312-860-7171
IL Rosemont, Advent Elctrns., Inc. 312-297-6200
IL Wooddale, Time Elctrns. 312-350-0610
IN Indianapolis, Advent Elctrns. 317-872-4910
IA Cedar Rapids, Advent Elctrns. 319-363-0221
KS Lenexa, Sterling Elctrns. 913-492-5406
KS Overland Park, Milgray Elctrns. 913-236-8800
MD Beltsville, Resco(Washington) 301-937-9100
MD Columbia, Milgray Elctrns. 301-621-8169
MD Columbia, Time Elctrns. 301-964-3090
MD White Marsh, Resco(Baltimore) 301-529-0500
MA Hopkinton, Interface Elctrns. Corp. 508-435-6858
MA Needham, Cronin Elctrns. 617-449-5000
MA Peabody, Time Elctrns. 508-532-9757
MA Wilmington, Milgray Elctrns. 617-657-5900
MI Farmington Hills, Advent Elctrns. 313-477-1650
MI Oak Park, Newark Elctrns. 313-967-0600
MN Edina, Time Elctrns. 612-835-1250
MN Minneapolis, Newark Elctrns. 612-331-6350
MN Minneapolis, Sterling/I.C.I. 612-831-2666
MO St. Louis, Time Elctrns. 314-391-6444
NH Manchester, Cronin Elctrns. 603-624-0105
NJ Mariton, Milgray Elctrns. 609-983-5010
NJ Morganville, Varitech Elctrns. 201-591-8801
NJ Parsippany, Milgray Elctrns. 201-335-1766
NJ Pine Brook, Time Elctrns. 201-882-4611
NJ Rockaway, Tonar Inds. 201-586-9000
NM Albuquerque, Sterling Elctrns. 505-884-1900
NY Airport, Time Elctrns. 516-383-8853
NY E. Syracuse, Time Elctrns. 315-432-0355
NY Hauppauge, Time Elctrns. 516-273-0100
NY Rochester, Milgray Elctrns. 716-235-0830
NC Charlotte, Elctrn. Mktg. Corp. 704-394-6195
NC Charlotte, Time Elctrns. 704-522-7600

NC Oxford, Time Elctrns. 919-693-5166
OH Cleveland, Milgray Elctrns. 216-447-1520
OH Columbus, Elctrn. Mktg. Corp. 614-299-4161
OH Dublin, Time Elctrns. 614-761-1100
OH Highland Hgts., Elctrn. Mktg. Corp. 216-442-3441
OH Highland Hts., Elctrn. Mktg. Corp. 216-442-3441
OH Kettering, Elctrn. Mktg. Corp. 513-439-4711
OH Valleyview, Newark Elctrns. 216-447-8860
OK Tulsa, Sterling Elctrns. 918-663-2410
OR Beaverton, Acacia Sls./Deanco 503-646-3377
OR Beaverton, Future Elctrns. 503-645-9454
OR Portland, Time Elctrns. 503-684-3780
OR Tualatin, Moore Elctrns. 503-692-5333
PA King of Prussia, Time Elctrns. 215-337-0900
TX Austin, Sterling Elctrns. 512-836-1341
TX Austin, Time Elctrns. 512-339-3051
TX Carrollton, Time Elctrns. 214-241-7441
TX Dallas, Milgray Elctrns. 214-248-1603
TX Dallas, Sterling Elctrns. 214-243-1600
TX Garland, Newark Elctrns. 214-487-8144
TX Houston, Newark Elctrns. 713-270-4800
TX Houston, Sterling Elctrns. 713-623-6600
UT Salt Lake City, Future Elctrns. 801-972-8489
UT Salt Lake City, Milgray Elctrns. 801-272-4999
UT Salt Lake City, Time Elctrns. 801-973-8181
WA Redmond, Future Elctrns. 206-881-8199
WA Redmond, Time Elctrns. 206-882-1600
WI Mequon, Taylor Elec. Co., Inc. 414-241-4321
Can Downsview, Ont., Future Elctrns. 416-638-4771
Can Kawata, Ont., Prelco 613-592-3636
Can Kawata, Ont., Time Elctrns. 416-672-5300
Can Montreal, PQ, Prelco 514-389-8051
Can Montreal, PQ, Tonar Inds. 514-286-4061
Can Montreal,PQ, Future Elctrns. 514-694-7710
Can Nepean, Ont., Carsten 613-726-9250
Can Ottawa, Ont., Future Elctrns. 613-820-8313
Can Scarborough, Carsten 416-495-9999
Can St. Laurent, PQ, Carsten 514-334-8321
Can Vancouver, BC, Future Elctrns. 604-294-1166
Can Willowdale, Ont., Milgray Elctrns./Toronto 416-756-4481

MURATA MANUFACTURING CO., LTD., 26-10-2-chome-Tenjin, Nagaoka-Kyo-Shi, Kyoto, Japan 617, Tel: 075-951-9111, TELEX: J64270, FAX: 075-955-0526; Empl.: 3,047; *Sls. Mgr.:* O. Otaka

MUSHIELD PRODUCTS, Div. Bomco Inc., Route 128, Blachburn Cir., Gloucester, MA 01930, Tel: 508-283-9000, TELEX: 95-5439, FAX: 508-283-2882; FSC No.: 22780; Empl.: 10; *Sls. Mgr.:* David Grilli; *Dist. Mgr.:* Mark L. Standley ..... **C•1746**

MWS Wire Industries

FAX: 818-706-0911

MWS WIRE INDUSTRIES, 31200 Cedar Valley Dr., Westlake Village, CA 91362, Tel: 818-991-8553; FSC No.: 51668; Empl.: 65; *Sls. Mgr.:* Greg Fancon ..... **C•1882-1885**

H. WM. MYERS & ASSOCS., 361 Virginia St., Crystal Lake, IL 60014, Tel: 815-459-0100; Empl.: 5; *Sls. Mgr.:* L. Peter Baenziger

NAMCO CONTROLS, An Acme-Cleveland Co., 7567 Tyler Blvd., Mentor, OH 44060, Tel: 216-946-9900, TELEX: 24-1566, FAX: 216-946-1228; Empl.: 200; *Sls. Mgr.:* Jon Slayburgh, VP & G/M, Elctrn. Bus.

NAMIKI PRECISION JEWEL CO., LTD., 15 Warren Street, Hackensack, NJ 07601, Tel: 201-343-3080, TWX: 710-990-1273, FAX: 201-343-3172; FSC No.: 201-343-3172

NANO PULSE INDUSTRIES, 440 Nibus St., Brea, CA 92670, Tel: 714-529-2600, FAX: 714-671-7919; FSC No.: 57222; *Sls. Mgr.:* Michael J. Schubert

NARDA MICROWAVE CORP., Subsidiary of Loral Corp., 435 Moreland Rd., Hauppauge, NY 11788, Tel: 516-231-1700, TWX: 510-221-1867, FAX: 516-231-1711

NATEL

FAX: 805-584-4357

NATEL ENGINEERING CO., INC., 4550 Runway St., Simi Valley, CA 93063, Tel: 805-581-3950, TWX: 910-494-1959; Empl.: 150; *Sls. Mgr.:* Anthony Carbone ..... **D•1194-1195**

Local Sales Offices & Reps
AL Huntsville, Saber Assocs. 800-327-0853
CA San Diego, McMillen & Assocs. 619-484-3402
CO Parker, Howard Assocs. 303-841-5755
FL Melbourne, Saber Assocs. 800-432-6288
GA Norcross, Saber Assocs. 800-327-0853
IL Glendale Hgts., Beta Technlg. Sls., Inc. 312-790-9886
IA Cedar Rapids, Midwest Tech. Sls., Inc. 319-365-4011
KS Lenexa, Midwest Tech. Sls., Inc. 913-888-5100
KS Wichita, Midwest Tech. Sls., Inc. 316-393-6705
MO St. Charles, Midwest Tech. Sls., Inc. 314-441-1012
NY N. Syracuse, Advanced Comps. Corp. 315-699-2671
NC Clayton, Saber Assocs. 800-327-0853
OH Dayton, Rixan Assocs., Inc. 513-222-0011
PA Morrisville, Nexus Technlg. Sls. Inc. 215-295-6549
TX Richardson, Lear Assocs. 214-231-5388
WA Mercer Island, Eagle Entprs., Inc. 206-232-7401
WI Milwaukee, Beta Technlg. Sls., Inc. 414-543-6609

NATIONAL ELECTRONICS CORP., 11731 Markon Dr., Garden Grove, CA 92641, Tel: 714-892-7749, 800-854-2451, TWX: 910-596-1316, FAX: 714-898-6769; Empl.: 50

NATIONAL CONTROLS CORP., 1725 Western Dr., W. Chicago, IL 60185, Tel: 312-231-5900, FAX: 312-231-1377; Empl.: 250; *Dist. Mgr.:* Cy Pfeifer

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Local Sales Offices & Reps
GA Atlanta, Natl. Instrs. 404-728-9119
IL Chicago, Natl. Instrs. 312-574-0050
MN Minneapolis, Natl. Instrs. 612-482-9930
OH Columbus, Natl. Instrs. 614-442-5740
TX Dallas, Natl. Instrs. 214-699-7474

Local Distributors
CA Mtn. View, Thorson West 415-964-9300
CA Riverside, Cal Tech Prods. 714-682-8506
CO Englewood, Odyssey 1 303-773-8176
MD Linthicum, KD Assocs. 301-859-5151
MA Reading, Scheinfein Assocs. 617-944-2304
NJ Manalapan, Beta Lambda 201-446-1100
NM Albuquerque, Odyssey 1 505-265-6645
UT Salt Lake City, Odyssey 1 801-485-4728
WA Woodenville, Team, Inc. 206-485-1111
Can Mississauga, Ont., Allan Crawford Assocs. 416-890-2010

NATIONAL MICRONETICS, 71 Smith Ave., Kingston, NY 12401, Tel: 914-338-0333, TWX: 510-247-8046, FAX: 914-338-0377; Empl.: 700; *Sls. Mgr.:* Richard Carlton

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NATIONAL SEMICONDUCTORS, LTD., See Silonex Inc.

NATIONAL-STANDARD CO., 601 N. 8th, Niles, MI 49120, Tel: 616-683-8100, TELEX: 295187, FAX: 616-683-6249; Empl.: 3100; *Sls. Mgr.:* D. M. Wedsworth; *Dist. Mgr.:* D. M. Wedsworth

NATIONAL TELEPHONE & ELECTRONICS INC., 2350 N.W. 96 Avenue, Miami, FL 33172, Tel: 305-592-0551, FAX: 305-599-0948; Empl.: 50

NATIONAL TEL-TRONICS, State Road Hill, Meadville, PA 16335, Tel: 814-724-6440, FAX: 814-333-3675; Empl.: 250; *Dist. Mgr.:* D. R. Booth

FAX: 213-225-4630

NATIONAL WIRE & CABLE CORP., 136 San Fernando Rd., Los Angeles, CA 90031-1780, Tel: 213-225-5611, TELEX: 181409, TWX: 910-321-4155; FSC No.: 04569; Empl.: 225 ..... **C•1886-1906**

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AR Cotter, P.M.I. Sls. Co. 501-430-5525
CA Redwood City, National Wire & Cable 415-365-1952
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CA Santa Clara, Ross Mktg. 408-988-8111
CO Arvada, Arrowhead/CSI Sls. 303-423-5556
FL Altamonte Springs, Gugel-Tuttle Assocs. 305-788-0845
FL Orlando, National Wire & Cable 305-898-3801
GA Lawrenceville, Tek-Rep Mktg. 404-963-1600
HI Hilo, Kirco Corp. 808-959-3888
IL Northfield, H. S. Tollaksen 312-441-6644
MD Glen Burnie, Faion Lott 301-744-4611
MA Norwood, Tom Maguire Assocs., Inc. .. 617-551-0500
MI Livonia, Luebbe Sls. 313-477-3131
MN Bloomington, Electro Smith Inc. 612-854-8775
MO St. Louis, P.M.I. Sls. Co. 314-353-4709
NJ Wayne, GT Assoc. 201-694-6040
NY Sodus, W. T. Woolard 315-655-8145
OH Cincinnati, Luebbe Sls. 513-530-0600
OH Cleveland, Luebbe Sls. 216-333-0425
OH Columbus, Luebbe Sls. Co. 614-431-0474
OH Dayton, Luebbe Sls. 513-294-0426
PA Hatboro, Jacobsen Assocs. 215-674-2937
PA Pittsburgh, Luebbe Sls. Co. 412-364-0490
TX Ft. Worth, Tesco, Inc. 214-553-1200
WA Redmond, Halbar Assocs. 206-882-0990
WA Vancouver, Halbar Assocs. 206-696-0170

NATIONWIDE ELECTRONIC SYSTEMS, See NES, Inc.

NAUGLER ENGINEERING, INC., Off Dunham Rd., Beverly, MA 01915, Tel: 617-922-5634, FAX: 617-468-1272; FSC No.: 05222; Empl.: 10; *Sls. Mgr.:* Kristen N. Bonnette

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NCR COMTEN, INC., NCR Corp., 2700 Snelling Avenue N., St. Paul, MN 55113, Tel: 612-638-8685, TELEX: 6879018 Comten, TWX: 910-563-3661, FAX: 612-638-8573; FSC No.: 7025-0010; Empl.: 2300; *Sls. Mgr.:* Edward J. Clark; *Dist. Mgr.:* James Woller

NCR MICROELECTRONICS, NCR Corporation, 1635 Aeroplaza Dr., Colorado Springs, CO 80916, Tel: 303-596-5795, 800-543-5618, TELEX: 241669 NCR NVMEM MSBG; FSC No.: 60924; *Sls. Mgr.:* Ted Lunacek; *Dist. Mgr.:* Mike Shapiro

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AZ	Tucson, Harris & Croy	602-882-8642
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CA	Calabasas, Quad-Rep Cen., Inc.	818-887-3711
CA	Irvine, Quad-Rep South, Inc.	714-727-4222
CA	Orangevalle, I Square, Inc.	916-989-0843
CA	San Diego, Quad-Rep.	619-560-8330
CA	Santa Clara, I Square, Inc.	408-988-3400
CO	Englewood, Thorson Rocky Mtn. Inc.	303-799-3435
CT	Woodbury, Anacon	203-266-0707
DE	Medford, Jack McCoy	609-953-0770
FL	Largo, TMA	813-536-3796
FL	Melbourne, TMA	305-676-3776
FL	Orlando, TMA	305-857-3760
FL	Pompano Bch., TMA	305-977-9006
GA	Atlanta, L & D, Inc.	404-395-7079
ID	Boise, Intermountain Tech.	208-888-6071
IL	Chicago, M. Gottlieb & Assocs.	312-775-1151
IN	Carmel, Fred A. Dorsey & Assocs.	317-844-4842
IA	Davenport, Rush & West Assocs.	319-388-9494
KS	Olathe, Rush & West Assocs.	913-764-2700
MD	Annapolis, E.E.S Assoc.	301-269-4234
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MI	Grand Rapids, Miltimore Sls.	616-942-9721
MI	Novi, Miltimore Sls.	313-349-0260
MO	St. Louis, Rush & West Assocs.	314-965-3322
MT	Boise, Inter-Mtn. Tech.	208-888-6071
NE	Davenport, Rush & West	319-388-9494
NV	Santa Clara, I Squared	408-988-3400
NV	Scottsdale, Harris & McCoy	602-951-9121
NJ	Fairfield, Tech. Applications & Mktg.	201-575-4130
NJ	Medford, Jack McCoy, Inc.	609-953-0770
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NY	Fairfield, TAM	201-575-4130
NC	Raleigh, L & D Inc.	919-876-5301
OH	Cincinnati, Makin Assocs.	513-871-2424
OH	Columbus, Makin Assocs.	614-848-5424
OH	Solon, Makin Assocs.	216-248-7370
OR	Tigard, Comps. West	503-684-1671
PA	Medford, Jack McCoy, Inc.	609-953-0770
PA	Solon, Makin Assocs.	216-248-7370
TN	Bristol, L & D, Inc.	615-878-2266
TX	Austin, Southwestern Tech. Sls.	512-440-0499
TX	Dallas, Southwestern Tech. Sls.	214-369-0977
TX	Houston, Southwestern Tech. Sls.	713-440-9200
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VA	Front Royal, Eltron Sls.	703-635-7201
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Can	Mississauga, Ont., Vitel Elctrns.	416-676-9720
Can	St. Laurent, Que., Vitel Elctrns.	514-331-7393

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AZ	Phoenix, Sterling Elctrns.	602-268-2121
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AZ	Tempe, Time Elctrns.	602-967-2000
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CA	Calabassas, Schweber Elec.	818-999-4702
CA	Chatsworth, Sterling	818-407-8850
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CA	San Jose, Eric Elctrns.	408-432-1111
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CA	Sunnyvale, Time Elctrns.	408-734-9888
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CO	Englewood, Sterling Elctrns.	303-792-3939
CO	Englewood, Time Elctrns.	303-799-8851
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CT	Wallingford, Sterling Elctrns.	203-265-9535
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FL	Pompano Bch., Schweber Elec.	305-977-7511
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GA	Norcross, Schweber Elec.	404-449-9170
GA	Norcross, Time Elctrns.	404-448-4488
IL	Elk Grove Vl, Schweber Elec.	312-364-3750
IL	Lisle, Comps., Inc.	312-852-7707
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KS	Overland Park, Sterling Elctrns.	913-492-5406
KS	Overland Pk., Schweber Elec.	913-492-2922
LA	Westwego, Sterling Elctrns.	504-436-1418
MD	Columbia, Time Elctrns.	301-964-3090
MD	Columbia, Vantage Comps., Inc.	301-720-5100
MD	Gaithersburg, Schweber Elec.	301-840-5900
MA	Bedford, Schweber Elec.	617-275-5100
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MO	Earth City, Schweber Elec.	314-739-0526
MO	St. Louis, Time Elctrns.	314-391-6444
NH	Manchester, Schweber Elec.	603-625-2250
NJ	Clifton, Vantage Comps., Inc.	201-777-4100
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NJ	Pinebrook, Time Elctrns.	201-882-4611
NJ	S. Plainfield, Sterling Elctrns.	201-769-7000
NM	Albuquerque, Sterling Elctrns.	505-884-1900
NY	E. Syracuse, Time Elctrns.	315-432-0355
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NY	Hauppauge, Time Elctrns.	516-273-0100
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NY	Rochester, Time Elctrns.	716-383-8853
NY	Smithtown, Vantage Comps., Inc.	516-543-2000
NY	Westbury, Schweber Elec.	516-334-7474
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NC	Greensboro, Hammond Elctrns.	919-275-6391
NC	Raleigh, Schweber Elec.	919-876-0000
OH	Beachwood, Schweber Elec.	216-464-2970
OH	Dayton, Schweber Elec.	513-439-1800
OH	Dublin, Time Elctrns.	614-761-1100
OK	Tulsa, Schweber Elec.	918-622-8000
OK	Tulsa, Sterling Elctrns.	918-663-2410
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OR	Portland, Time Elctrns.	503-684-3780
PA	Export, Advacom	412-733-5400
PA	Horsham, Schweber Elec.	215-441-0600
PA	King of Prussia, Time Elctrns.	215-337-0900
PA	McKean, Advacom	814-496-7774
PA	Pittsburgh, Schweber Elec.	412-963-6804
SC	Greenville, Hammond Elctrns.	803-233-4121
TX	Austin, Schweber Elec.	512-339-0088
TX	Austin, Sterling Elctrns.	512-836-1341
TX	Austin, Time Elctrns.	512-339-3051
TX	Carrollton, Time Elctrns.	214-241-7441
TX	Dallas, Schweber Elec.	214-661-5010
TX	Dallas, Sterling Elctrns.	214-243-1600
TX	Houston, Schweber Elec.	713-784-3600
TX	Houston, Sterling Elctrns.	713-623-6600
UT	Salt Lake City, Time Elctrns.	801-973-8181
VA	Richmond, Sterling Elctrns.	804-226-2190
VA	Sterling, Sterling Elctrns.	703-450-2373
WA	Redmond, Time Elctrns.	206-882-1600
WI	New Berlin, Schweber Elec.	414-784-9020
Can	Ontario, Time Elctrns.	416-672-5300

NEC

FAX: 415-965-6130

NEC ELECTRONICS, INC., 401 Ellis Street, P.O. Box 7241, Mountain View, CA 94039, Tel: 415-960-6000, TWX: 910-379-6985; Empl.: 1200; *Sls. Mgr.:* Mike Despotes; *Dist. Mgr.:* Michael Kelly ..... **A•1140-1143; B•1092-1093, 1324-1332, 1586-1591**

Local Sales Offices & Reps

AL	Huntsville, 20th Century Mktg.	205-533-9281
AZ	Phoenix, Oasis Sls., Inc.	602-277-2714
CA	Cardiff, Mission Technlg.	619-753-5092
CA	Mtn. View, NEC Elctrns.	415-965-6200
CA	San Jose, Exis	408-433-3947
CA	Santa Ana, NEC Elctrns.	714-546-0501
CO	Aurora, NEC Elctrns.	303-755-6353
CO	Boulder, Promotional Technlg.	303-530-4774
CO	Parker, Promotional Technlg.	303-841-4664
CT	Cheshire, Datatrack Engrg., Inc.	203-271-1311
FL	Altamonte Springs, V.G. Sls., Inc.	407-831-8688
FL	Ft. Lauderdale, NEC Elctrns.	305-776-0682
FL	Largo, V.G. Sls. Co., Inc.	813-536-7787
FL	Maitland, NEC Elctrns.	407-875-1145
FL	Pompano Bch., V.G. Sls. Co., Inc.	305-971-0900
GA	Norcross, NEC Elctrns.	404-447-4409
GA	Norcross, 20th Century Mktg. Inc.	404-446-1999
IL	Arlington Hgts., NEC Elctrns.	312-577-9090
IL	Schaumburg, Martan Inc.	312-303-5660
IN	Carmel, Technlg. Mktg. Corp.	317-844-8462
IN	Ft. Wayne, Technlg. Mktg. Corp.	219-432-5553
IA	Cedar Rapids, Stan Clothier Co.	319-365-1717
KS	Overland Pk., AME Sls.	913-262-3971
KY	Louisville, Technlg. Mktg. Corp.	502-893-1377
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MA	Natick, NEC Elctrns.	508-655-8833
MA	Woburn, Compass Technlg.	617-933-3336
MI	Grand Rapids, Miltimore Sls.	616-942-9721
MI	Novi, Miltimore Sls.	313-349-0260
MI	Troy, NEC Elctrns.	313-680-0506
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MN	Minneapolis, Stan Clothier Co.	612-944-3456
MO	St. Charles, AME Sls.	314-947-0333
NJ	Bellmawr, TAI Corp.	609-933-2600
NJ	Saddle Brook, Metro Logic Corp.	201-797-8844
NY	Fairport, NEC Elctrns.	716-425-4590
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NY	Pittsford, Elcom Sls.	716-385-1400
NY	Poughkeepsie, NEC Elctrns.	914-452-4747
NY	Skaneateles, Elcom Sls.	315-685-8245
NC	Charlotte, Quantum Mktg. Inc.	704-523-8822
NC	Durham, NEC Elctrns.	919-544-4132
NC	Raleigh, Quantum Mktg. Inc.	919-846-5728
OH	Columbus, NEC Elctrns.	614-436-1778
OR	Portland, NEC Elctrns.	503-245-1600
OR	Portland, Venture Elctrns.	503-624-0617
PA	Trevose, NEC Elctrns.	215-638-8989
TX	Austin, NEC Elctrns.	512-346-9280
TX	Austin, TL Mktg., Inc.	512-453-4586
TX	Dallas, NEC Elctrns.	214-931-0641
TX	Dallas, TL Mktg., Inc.	214-484-6800
TX	Houston, TL Mktg., Inc.	713-589-2763
UT	Midvale, Promotional Technlg. Corp.	801-566-8919
WA	Bellevue, Venture Elctrns.	206-454-4594
WI	Mequon, Martan Inc.	414-241-4955
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Can	Surrey, BC, Kaytronics Western	604-581-5005
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CA	Costa Mesa, Insight Elctrns.	714-556-6890
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CA	San Diego, Insight Elctrns.	619-587-0471
CA	San Diego, Marshall Inds.	619-578-9600
CA	San Diego, Western Microtechnology	619-453-8430
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CA	San Jose, IEC	408-435-1000
CA	San Jose, Merit Elctrns.	408-434-0800
CA	Santee, Mouser Elctrns.	619-449-2222
CA	Saratoga, Western Microtechnology	408-725-1660
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CO	Denver, IEC	303-292-6121
CO	Englewood, Sterling Elctrns.	303-792-3939
CO	Thornton, Marshall Inds.	303-451-8383
CT	Milford, Milgray Elctrns.	203-878-5538
CT	Wallingford, Cronin Elctrns.	203-265-3134
CT	Wallingford, Marshall Inds.	203-265-3822
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FL Ft. Lauderdale, Reptron Elctrns. 305-735-1112
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FL Winter Park, Milgray Elctrns. 407-647-5747
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GA Norcross, Milgray Elctrns. 404-446-9777
GA Norcross, Reptron Elctrns. 404-446-1300
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MO Bridgeton, Marshall Inds. 314-291-8795
NJ Clifton, Vantage Comps. 201-777-4100
NJ Fairfield, Marshall Inds. 201-882-0320
NJ Marlton, Milgray Elctrns. 609-983-5010
NJ Mt. Laurel, Marshall Inds. 609-234-9100
NJ Parsippany, Milgray Elctrns. 201-335-1766
NJ Randolph, Mouser Elctrns. 201-328-3322
NJ South Plainfield, Sterling Elctrns. 201-769-7000
NM Albuquerque, Sterling Elctrns. 505-884-1900
NY Farmingdale, Milgray Elctrns. 516-420-9800
NY Hauppauge, Marshall Inds. 516-273-2424
NY Holbrook, Micro Genesis 516-472-6000
NY Johnson City, Marshall Inds. 607-798-1611
NY Rochester, Marshall Inds. 716-235-7620
Can Rochester, Milgray Elctrns. 716-235-0830
NC Charlotte, Electronic Mktg. Corp. 704-394-6195
NC Raleigh, Marshall Inds. 919-878-9882
NC Raleigh, Resco 919-781-5700
OH Columbus, Electronic Mktg. 614-299-4161
OH Dayton, Marshall Inds. 513-898-4480
OH Highland Hgts., Electronic Mktg. 216-442-3441
OH Independence, Milgray Elctrns. 216-447-1520
OH Solon, Marshall Inds. 216-248-1788
OH Solon, Reptron Elctrns. 216-349-1415
OH Worthington, Reptron Elctrns. 614-436-6675
OK Tulsa, Sterling Elctrns. 918-663-2410
OR Beaverton, IEC 503-641-1690
OR Beaverton, Marshall Inds. 503-644-5050
PA Philadelphia, Almo Elctrns. 215-698-4000
OR Beaverton, Western Microtechnology 503-629-2082
TX Austin, Marshall Inds. 512-837-1991
TX Austin, Sterling Elctrns. 512-836-1341
TX Carrollton, Marshall Inds. 214-233-5200
TX Dallas, Milgray Elctrns. 214-248-1603
TX Dallas, Sterling Elctrns. 214-243-1600
TX El Paso, Marshall Inds. 915-593-0706
TX Houston, Marshall Inds. 713-895-9200,1-800-392-2416
TX Houston, Sterling Elctrns. 713-627-9800
TX Mansfield, Mouser Elctrns. 817-483-0165
TX Richardson, Insight Elctrns. 214-783-0800
UT N.Salt Lake City, IEC 801-298-1869
UT Salt Lake City, Marshall Inds. 801-485-1551
UT Salt Lake City, Milgray Elctrns. 801-272-4999
VA Herndon, Sterling Elctrns. 703-742-8400
VA Richmond, Sterling Elctrns. 804-226-2190
WA Bellevue, IEC 206-455-2727
WA Bellevue, Marshall Inds. 206-486-5747
WA Redmond, Western Microtechnology .. 206-881-6737
WI Milwaukee, Marsh Elctrns. 414-475-6000
WI Waukesha, Marshall Inds. 414-797-8400
Can Burnaby,BC, ITT Multicomponents/RAE Elctrns. 604-291-8866
Can Calgary,Alberta, ITT Multicomponents/RAE Elctrns. 403-253-8575
Can Calgary,Alberta, MEMCO 403-258-3399
Can Concord, Ont., ITT Multicomponents/RAE Elctrns. 416-736-1144
Can Dartmouth,Nova Scotia, ITT Multicomponents/RAE Elctrns. 902-456-2350
Can Edmonton, Alberta, MEMCO 1-800-661-9536
Can Edmonton,Alberta, ITT Multicomponents/RAE Elctrns. 403-451-4001
CA Irvine, IEC 714-837-9960
Can Moncton,New Brunswick, ITT Multicomponents/RAE Elctrns. 506-857-8011
Can Nepean,Ont., ITT Multicomponents/RAE Elctrns. 613-226-7406
Can Nepean,Ont., Carsten Elctrns. LTD. 613-726-9250
Can Saskatoon,Que., MEMCO 1-800-661-9536
Can Scarborough,Ont., Carsten Elctrns. LTD. 416-495-9999
Can Surrey, BC, MEMCO 604-590-1553
Can Victoria,BC, MEMCO 604-383-2400
Can Ville St. Laurent, Que., ITT Multicomponents/RAE Elctrns. 514-335-7697
Can Ville St. Laurent,Que., Carsten Elctrns. LTD. 514-334-8321
Can Willowdale,Ont., Milgray Elctrns. 416-491-4481
Can Winnipeg, Manitoba, MEMCO 1-800-661-9536
Can Winnipeg,Manitoba, ITT Multicomponents/RAE Elctrns. 204-786-8401

NEC INFORMATION SYSTEMS, INC., 1414 Massachusetts Ave., Boxborough, MA 01719, Tel: 617-264-8000, TELEX: 92-3434; Empl.: 1500; *Sls. Mgr.:* Richard Gilbert/Robert Henderson; *Dist. Mgr.:* Richard Gilbert/John Bruni

NEDAP N.V., P.O. Box 6, Groenlo, Holland 7140 AA, Tel: ò31-5440-71111, TELEX: 44253, FAX: ò31.5440.62745; Empl.: 360; *Sls. Mgr.:* W. Bonnemeier

N.E.D. CABLE CO., Div. of Electro-Prep, Inc., 16 Proctor St., Salem, MA 01970, Tel: 617-745-9911; Empl.: 10; *Sls. Mgr.:* R. M. Sullivan

NEDCO ELECTRONICS, INC., 8246 LeHigh, Morton Grove, IL 60053, Tel: 312-967-0500, FAX: 312-967-0505; Empl.: 10

NEFF INSTR., 700 S. Myrtle Ave., Monrovia, CA 91016, Tel: 818-357-2281, TWX: 910-585-1833, FAX: 818-303-2286; Empl.: 125; *Sls. Mgr.:* James L. Taylor

NEI
Ferranti-Packard

FAX: 416-625-6197

NEI FERRANTI-PACKARD ELECTRONICS, 6030 Ambler Dr., Mississauga, Ont., Canada L4W 2P1, Tel: 416-624-3020, TELEX: 06-961437; Empl.: 225; *Sls. Mgr.:* Paul A. Manuel ..... **B•1095-1097**

Local Sales Offices & Reps

IL Chicago, NEI Svc. 800-263-4346
MA Hopkinton, FP Displays, Inc. 617-742-2335
NH Nashua, Bell Controls Inc. 603-882-6984
PA Paoli, Tyler Griffin Co. 215-647-1550
TX Dallas, NEI Svc. 800-263-4346
Can Mississauga, Ont., NEI Ferranti-Packard Elctrns. 416-624-3020

NEL FREQUENCY CONTROLS, INC., 357 Beloit St., Burlington, WI 53105, Tel: 414-763-3591, TWX: 910-278-2450, FAX: 414-763-2881; FSC No.: 00815; Empl.: 225; *Sls. Mgr.:* Dick Griebel, VP Sls. & Mktg.; *Dist. Mgr.:* Lyann Jung ..... **A•1455-1457**

Local Sales Offices & Reps

AL Huntsville, 20th Century Mktg. 205-533-9281
AZ Tempe, A5 Co. 602-968-4923
CA Burlingame, Wm. J. Purdy Co. 415-347-7701
CA Huntington Beach, Mil-Com Sls. 714-840-2424
CO Parker, A5 Co. 303-841-3651
FL Orlando, Richmar Elctrns. 407-352-3755
GA Norcross, 20th Century Mktg. 404-446-1999
IL Downers Grove, Richmar Elctrns. 312-968-0118
IN Indianapolis, Richmar Elctrns. 317-577-9950
IA Iowa City, Richmar Elctrns. 319-354-8894
MI Adrian, Elctrn. Salesmasters 517-263-2500
MN Minneapolis, Holmgren Assocs. 612-786-7641
NH Nashua, Bell Controls 603-882-6984
NJ Hopelawn, Kamco Indl. Sls. 201-422-6252
NJ Medford, Champion 800-234-2426
NC Cary, 20th Century Mktg. 919-481-3370
OH Beechwood, Elctrn. Salesmasters 216-831-9555
OR Lake Oswego, RTS, Inc. 503-244-4123
TN Knoxville, 20th Century Mktg. 615-966-2099
TX Plano, Richmar Elctrns. 214-424-8388
WA Vashon, RTS, Inc. 206-285-1363
WI Butler, Richmar Elctrns. 414-781-1730
EXP San Juan, Puerto Rico, Elctrn. Tech. Sls. 809-798-1300

Local Distributors

CA Agoura Hills, Pacesetter 818-991-3984
CA Anaheim, Pacesetter 714-779-5855
CA Canoga Park, Tim-Co 818-992-5040
CA Fountain Valley, Components Ctr. 714-979-0433
CA Irvine, Integrated Elctrns. 714-837-9960
CA Sacramento, Integrated Elctrns. 916-424-5297
CA San Jose, All American 408-943-1200
CA San Jose, Integrated Elctrns. 408-435-1000
CA San Jose, Pacesetter 408-436-8822
CA San Jose, Sierra West 408-435-7477
CA Santa Clara, Components Ctr. 408-988-3751
CA Torrence, All American 800-664-8300
CO Denver, Integrated Elctrns. 303-292-6121
FL Miami, All American 305-621-8282
IL Hoffman Estates, Integrated Elctrns. .. 312-843-2040
IL Northbrook, Classic Comps. 312-272-9650
IL Rosemont, Advent 800-323-1270
IN Indianapolis, Advent 317-872-4910
IA Cedar Rapids, Advent 319-363-0221
MD Jessup, Treeko Elctrns. 301-792-0112
MD Rockville, All American 800-426-0420
MA Billerica, Mayer Elctrns. 617-229-2255
MA Middleboro, Glynn Elctrns. 800-225-8684
MA Wakefield, All American 800-874-2834
MI Farmington Hills, Advent 313-477-1650
MN Eden Prairie, All American 612-944-2151
MN Minneapolis, Bergquist 612-835-2322
NY Buffalo, Genesee Indl. 716-873-9661
NY Rochester, Masline Elctrns. 716-546-5373
NY Ronkonkoma, All American 800-874-2830
NY Stony Brook, Dove Elctrns. 516-689-7733
OH Englewood, Ärgent 513-836-8633
OH Solon, Repco Elctrns. 216-248-8900
OK Tulsa, Altair 918-252-5781
OR Beaverton, Integrated Elctrns. 503-641-1690
RI Richardson, All American 800-541-1435
TX Austin, Altair Co. 512-837-4970
TX Dallas, MP Sys. 214-385-8885
TX Dallas, Off The Shelf 214-247-0052
TX Houston, Altair Co. 713-462-3029
TX Richardson, Altair Co. 214-231-5166
TX Richardson, Off The Shelf 214-238-0808
UT Salt Lake City, Integrated Elctrns. 801-298-1869
WA Bellevue, Integrated Elctrns. 206-455-2727
WI Mequon, Taylor Elec. 800-242-8914
WI New Berlin, Classic Comps. 800-242-7408
Can Calgary, Alberta, Memco 403-258-3399
Can Surrey, B.C., Memco 604-590-1553

NEPENTHE, INC., 2471 E. Bayshore Road, Palo Alto, CA 94303, Tel: 415-856-9332, 800-NEPENTHE, TWX: 910-373-2060; FSC No.: 415.856 8650; Empl.: 50; *Sls. Mgr.:* Mark Urban

NESCO BATTERY SYSTEMS, National Electro-Sales Corp., 7110 Gerald Ave., Van Nuys, CA 91406-7840, Tel: 818-781-0505, FAX: 818-786-2758

NESHAMINY TRANSFORMER, Neshaminy Electronics Corp., Edison-Furlong Road, Furlong, PA 18925, Tel: 215-794-7411; *Sls. Mgr.:* Philip Klein

NES *Slimline* – *A Systems-Oriented Panel Meter*

FAX: 312-426-6630

NES, INC. (NATIONWIDE ELECTRONIC SYSTEMS), 3003 Wakefield, Carpentersville, IL 60110, Tel: 312-426-5900; Empl.: 54; *Sls. Mgr.:* Jerry Bestler; *Dist. Mgr.:* Jerry Bestler ..... **B•1098; D•1153, 1406-1411**

Local Sales Offices & Reps

WA Bellevue, Al Smith Co. 206-746-6770

Local Distributors

IL Bridgeview (Chicago), Norman Equip. Co. 312-430-4000
IL Mt. Prospect, Feed Controls 312-253-3898
WI Appleton, G.W.S. Supp. 414-739-6066
Can Montreal, Que., Mod-tronic Instr. Ltd. .. 514-848-7205

NETCOM, INC, 3000 Commerical Ave.,P.O.Box 3025, Northbrook, IL 60065-3025, Tel: 312-564-5100, FAX: 312-564-2279; FSC No.: 57193; Empl.: 105; *Sls. Mgr.:* Wayne Roeder

NETWORKS INTERNATIONAL CORPORATION, 13924 W. 108th St., Lenexa, KS 66215, Tel: 913-469-6494, FAX: 913-469-6495; Empl.: 15; *Sls. Mgr.:* Abhay Bisarya; *Dist. Mgr.:* Abhay Bisarya

NEURON

FAX: 213-375-6145

NEURON ELECTRONICS, INC., 24050 Madison St, Torrance, CA 90505, Tel: 213-375-5407, 213-375-5333; Empl.: 4; *Sls. Mgr.:* Steve Stone ..... **D•1101**

NEUTRIK PRODUCTS, See Kulka Smith

NEW ENGLAND SMELTING WORKS, INC., 502 Union St, Box 29, W. Springfield, MA 01090, Tel: 413-734-6491; FSC No.: 3439; Empl.: 40; *Sls. Mgr.:* David R. Saffer

NEW HAMPSHIRE BALL BEARINGS, INC., NMB (USA), Inc., Rte. 202, Peterborough, NH 03458, Tel: 603-924-3311, TWX: 710-364-1805; Empl.: 1500

NEWMAN, M. M., CORP., Heli-Tube Div., P.O. Box 615, Marblehead, MA 01945, Tel: 617-631-7100, FAX: 617-631-8887; FSC No.: 09106; *Sls. Mgr.:* C. Loutrel; *Dist. Mgr.:* C. Loutrel ..... **C•1874**

NEW MEDIA GRAPHICS CORP., Matrix Corp., 780 Boston Rd., Billerica, MA 01821, Tel: 508-663-0666, FAX: 508-663-6678; Empl.: 50

NEWPORT

FAX: 714-546-3022

NEWPORT ELECTRONICS, 2229 S.Yale St, Santa Ana, CA 92704-4426, Tel: 714-540-4914, TWX: 910-595-1787; Empl.: 160; *Sls. Mgr.:* Jim Way ..... **D•1412-1413**

Local Sales Offices & Reps

AL	Birmingham, Richardson Co.	205-979-0550
AZ	Phoenix, CPS Assocs.	602-246-1097
CA	Milpitas, IFM, Inc.	408-945-5920
CA	Orange, Electramation	714-997-8420
CO	Denver, AKI Entprs.	303-388-4488
FL	Orlando, Datarep, Inc.	305-843-5224
IL	Arlington Hgts., Brainard-Wilson	312-437-2700
IN	Ft. Wayne, Walter M. Bierberich Inc.	219-432-2537
IA	Des Moines, H & H Vega Sls. Assocs.	515-280-8088
KS	Shawnee Mission, H & H Vega Sls.	316-722-7856
MD	Joppa, Electra-Tech	301-877-0344
MA	Billerica, Eastronix, Inc.	617-670-2400
MI	Livonia, Amtech Reps.	313-474-8300
MN	Eden Prairie, Rockmore Sls. Corp.	612-941-1390
MO	St. Charles, Power Transmission Sys.	314-928-1750
NJ	Parlin, JMR Sls.	201-254-8484
NY	Wading River, JMR Sls., Inc.	516-929-5756
NC	Charlotte, SPK Instrmn.	704-535-2345
OH	Dayton, Dolfuss-Root & Co.	513-433-6776
OH	Strongsville, Dolfuss-Root & Co.	216-238-0300
PA	Bridgeville, Dolfuss-Root & Co.	412-221-4420
PA	Valley Forge, J. E. Cuesta & Co., Inc.	215-935-0400
SC	Greenville, SPK Instrmn.	803-297-4133
TN	Memphis, Southeastern Marketing	901-529-9818
TX	Addison, Associated Dyn., Inc.	214-387-3800
VA	Dumfries, Electra-Tech	703-670-6962
WA	Redmond, Sls. & Engrg. Assocs.	206-883-4999
WI	Waukesha, Brainard-Wilson	414-797-7940

Local Distributors

AL	Birmingham, Brownell Instrs.	205-332-3374
AZ	Tempe, Metermaster	602-431-0015
AR	Little Rock, Brownell Instrs.	501-562-2061
CA	Costa Mesa, FLW, Inc	714-751-7512
CA	Foster City, Therm-X	415-571-1166
CA	Fremont, FLW, Inc.	415-651-6511
CA	Los Angeles, EIL Instrs., Inc.	213-685-7020
CA	S. San Francisco, Steven Engrg.	415-588-9200
CA	San Leandro, Coast Instr.	415-483-3774
CA	Yorba Linda, Metermaster	714-921-2101
CO	Aurora, R & R Instrmn.	303-340-8728
CT	Middletown, EIL Instrs., Inc.	203-346-6646
FL	Orlando, FLW, Inc.	407-894-1100
GA	Atlanta, Sesco, Inc.	404-458-6423
GA	Atlanta (Hapeville), Brownell Electro	404-762-5181
GA	Marietta, FLW Southeast	404-424-1731
HI	Kailua, FLW, Inc.	808-945-1030
IL	Chicago, Data Elctrns. Co.	312-283-0300
IL	Countryside, Pacific Indicator	312-352-3500
IL	Glendale Heights, Crompton Metermaster	312-351-4554
IN	Evansville, Electro-Lab Svcs.	812-423-5211
IA	Davenport, Universal Precision Instr.	319-326-5757
KS	Kansas City, Process Measurement	913-384-2064
KY	Louisville, P. I. Burkes Co.	502-589-3960
LA	Slidell, Process & Engrg. Prod.	504-641-0652
MD	Sparks, EIL Instr.	301-771-4800
MA	Waltham, Calibron Instrs.	617-894-6440
MI	Royal Oak, George Instr.	313-280-1111
MN	Minneapolis, Instrmn. Svcs.	612-544-8916
MN	Minneapolis, Process Meas.	612-544-4035
MO	Kansas City, ISL Corp.	816-587-5400
MO	Manchester, Universal Precision Inst.	314-394-4693
NE	Omaha, Interstate Indl.	402-331-3535
NJ	Newfoundland, Hosica Labs.	201-697-6111
NY	Buffalo, EIL/Trott Elctrns.	716-634-8500
NY	Buffalo, KOM Lamb	716-874-3530
NY	Farmingdale, Brownell Electro	516-420-5990
NC	Charlotte, EIL/Trott Elctrns.	704-376-2237
OH	Cincinnati, Schlemmer	513-522-8340
OH	Cleveland, Pioneer Instr.	216-587-3600
OH	Cleveland, Weschler Elec.	216-238-2550
OH	Dayton, Pioneer Instr.	513-236-9900
OH	Toledo, Girkins Elec.	419-478-5600
OK	Tulsa, Inotek	918-627-1500
OR	Portland, EIL Instruments	503-221-1123
OR	Portland, Westcon	503-283-0132
PA	Philadelphia, Sunshine Scientific	215-673-5600
PA	York, Trola Inds.	717-848-3700
SC	Columbia, Brownell Instrs.	803-772-6111
TN	Knoxville, Brownell	615-966-3441
TX	Dallas, Dallas Meter Tek	214-349-6044
TX	Dallas, Inotek	214-243-7000
TX	Houston, American Analog	713-941-7265
UT	N. Salt Lake, Western Controls	801-292-5900
VA	Richmond, Metermetrics	804-275-1431
WA	Seattle, Branom Instrs.	206-762-6050
WA	Seattle, EIL Instruments	201-882-3222
WI	Milwaukee, E-M Instrs.	414-272-7799

NEW WAVE INSTRUMENTS, 128 W 3100 N., Provo, UT 84604, Tel: 801-373-4909, TWX: 510-601-2474, ESYLNK: 62925379; *Sls. Mgr.:* Larry Christensen

THE J. M. NEY COMPANY, Ney Industrial Park, Bloomfield, CT 06002, Tel: 203-242-2281, TELEX: 9-9238, FAX: 203-242-5688; *Sls. Mgr.:* Hal Poschmann ..... **C•1463, 1619; D•2241**

Local Sales Offices & Reps

CA	San Diego, The J.M. Ney Co.	619-462-4214
CT	Hartford, The J.M.Ney Co.	203-242-2281
IL	Chicago, The J.M.Ney Co.	312-724-0431
MA	Springfield, The J.M.Ney Co.	413-566-5542
MI	Detroit, The J.M.Ney Co.	313-477-8774
NJ	Newark, The J.M.Ney Co.	201-968-4218

NGK BERYLCO, NGK Metals Corporation, P.O. Box 13367, Reading, PA 19612-3367, Tel: 215-921-5000, TWX: 510-651-0677; Empl.: 600; *Sls. Mgr.:* Robert E. Strock

NH RESEARCH, INCORPORATED, Instrumentation Products Division, 16601 Hale Ave., Irvine, CA 92714, Tel: 714-474-3900, TELEX: 67-8377, FAX: 714-474-7062; Empl.: 120; *Sls. Mgr.:* Fred Sabatine

NH RESEARCH, Powertest Automatic Power Supply Test Systems, 16601 Hale Avenue, Irvine, CA 92714, Tel: 714-474-3900, TELEX: 67-8377, FAX: 714-474-7062; FSC No.: 24862; Empl.: 125; *Sls. Mgr.:* Sam Duran

NIC COMPONENTS CORP., 6000 New Horizons Blvd., N. Amityville, NY 11701, Tel: 516-226-7500, TELEX: 221-228, FAX: 516-226-6262; Empl.: 50; *Sls. Mgr.:* Robert Schatz; *Dist. Mgr.:* Nancy Lamendola ..... **A•1144-1145, 2000**

Local Sales Offices & Reps

CA		
CA	San Diego, Eagle Sls.	619-743-6550
CT	Bloomfield, F.S.I.	203-243-3122
IL	Lisle, W. G. Controls	312-963-5954
IN	Indianapolis, Elctrn. Rep. Inc.	317-894-1414
KS	Overland Park, Thomas L. Dowell & Assocs.	913-648-7373
LA	Hammond, Design Mktg.	504-294-3076
MA	Glouchester, F.S.I.	617-281-3864
MI	Grand Rapids, Burcaw Co.	313-573-4605
MI	Wyoming, Burcaw Co.	313-573-4605
MO	St. Louis, Thomas L. Dowell & Assocs.	314-849-4234
NY	Hicksville, J-Square Mktg. Inc.	516-935-3200
TX	Irving, Design Mktg.	214-607-0611
TX	Round Rock, Design Mktg.	512-255-9896

Local Distributors

AZ	Tempe, Acacia Sls.	602-894-2874
AR	Little Rock, Carlton-Bates	501-562-9100
CA	Garden Grove, Bell Inds.	714-895-7801
CA	San Diego, Western Microtechnology	619-453-8430
CA	Sunnyvale, Bell Inds.	408-734-8570
CA	Tustin, Projections Unlimited	714-544-2700
CO	Wheatridge, Bell Inds.	303-424-1985
CT	Danbury, Pilgrim Elctrns.	203-792-7274
CT	Wallingford, Mid-State Elctrns.	203-265-9900
FL	Clearwater, Future Elctrns.	813-578-2770
FL	Largo, Bell inds.	813-541-4434
FL	Orlando, Hammond Elctrns.	407-841-1010
GA	Norcross, Bell Inds.	404-662-0923
GA	Norcross, Hammond Elctrns.	404-449-1996
IL	Addison, Belford Elctrns.	312-691-1100
IL	Elk Grove VL, Bell Inds.	312-640-1910
IL	Schaumburg, QPS	312-884-6620
IN	Ft. Wayne, Bell Inds./Graham Div.	219-423-3422
IN	Indianapolis, Meunier	317-635-3511
KY	Louisville, Peerless Elctrns.	502-637-7674
MD	Gaithersburg, Axis Elctrns.	301-840-9640
MA	Chelmsford, TLC Inc.	508-250-9666
MI	Grand Rapids, SF Elctrns.	616-459-0216
MI	Livonia, RS Elctrns.	313-525-1155
MN	New Brighton, Chris Elctrns.	612-631-2647
MO	St. Louis, Future Elctrns.	314-469-6805
MO	St. Louis, Van Sickle Radio	314-621-5000
NH	Nashua, Brevan Elctrns.	603-889-7230
NJ	Rockaway, Tonar Inds.	201-586-9000
NJ	South River, M-Tronics	201-613-8390
NY	Farmingdale, Bell Inds.	516-752-9303
NY	Liverpool, Future Elctrns.	315-451-2371
OH	Dayton, Bell Inds./Graham Div.	513-435-8660
OH	Dayton, Stotts Friedman Inc.	513-298-5555
OK	Oklahoma City, Carlton-Bates Co.	918-250-1620
OR	Beaverton, Acacia Sls.	503-646-3377
PA	McKean, Advacom Inc.	814-476-7774
TN	Hixson, Techni-tronics	615-842-0514
TX	Richardson, Bell Inds.	214-690-0466
TX	Richardson, Future Elctrns.	214-437-2437
UT	Salt Lake City, Bell Inds.	801-972-6969
WA	Kirkland, Priebe Elctrns.	206-821-4695
Can	Pointe Claire, Future Elctrns.	514-694-7710

NICHICON (AMERICA) CORP., 927 E. State Pkwy., Schaumburg, IL 60173, Tel: 312-843-7500, TELEX: 20-6577, FAX: 312-843-2798/7125; *Sls. Mgr.:* Russ Edwards; *Dist. Mgr.:* Buddy Black

NICHIFU AMERICA, INC., 60 Robinson St, Pottstown, PA 19464, Tel: 215-323-7120, FAX: 215-970-2096; *Sls. Mgr.:* Roy Allen

NICOLET INSTRUMENT CORP., Test Instrument Division, 5225 Verona Rd., P.O. Box 4288, Madison, WI 53711, Tel: 608-271-3333, TELEX: 608-273-5061, TWX: 910-286-2737; Empl.: 700; *Sls. Mgr.:* Jeffry Shahan

NICOLET COMPUTER GRAPHICS DIV., See Bruning Computer Graphics

NIDEC CORPORATION, 100 Franklin Drive, Torrington, CT 06790, Tel: 203-482-4422, TELEX: 643963; Empl.: 350; *Sls. Mgr.:* Robert Murphy; *Dist. Mgr.:* Rich Brache

NITTANY PIEZO CERAMICS, See Piezo Kinetics, Inc.

NJE POWER SUPPLIES

FAX: 201-329-6185

NJE CORPORATION, 329 Culver Rd, P.O. Box 669, Dayton, NJ 08810-0669, Tel: 201-329-4611, TWX: 710-480-5674; FSC No.: 98380; Empl.: 105; *Sls. Mgr.:* John Slavik ..... **D•1925-1928**

Local Sales Offices & Reps

NJ	Dayton, NJE Corp.	201-329-4611

nkk switches OF AMERICA INC.

FAX: 602-998-1435

NKK SWITCHES OF AMERICA, INC., 14415 N. Scottsdale Rd., Scottsdale, AZ 85260, Tel: 602-991-0942; FSC No.: 63426; Empl.: 473; *Sls. Mgr.:* Joseph Nessim; *Dist. Mgr.:* Joseph Nessim ..... **B•1816-1821**

Local Sales Offices & Reps

AL Huntsville, Over & Over 205-837-7105
AZ Phoenix, C.T. Carlberg & Assocs. 602-468-0750
AZ Scottsdale, NKK Switches 602-991-0942
CA Santa Clara, Caltron Components Corp. 408-980-0181
CA Torrance, O'Donnell Assocs. Inc. 213-539-9664
CO Wheatridge, Cluff & Assocs. Inc. 303-425-6604
FL Altamonte Springs, Over & Over, Inc. 407-332-1222
FL Coral Springs, Over & Over Inc. 305-753-7050
FL Tampa, Over & Over Inc. 813-626-9100
GA Norcross, Over & Over, Inc. 404-449-6205
ID Boise, Bob Sickler Sls. Co. 208-344-9588
IL Mt. Prospect, The Dombrow Co., Inc. 312-253-3326
IN Carmel, Frank E. Kahsar Sls. 317-844-9353
IA Cedar Rapids, Midwest Tech. Sls. 319-365-4011
KS Goddard, Midwest Tech. Sls. 316-794-8565
KS Lenexa, Midwest Tech. Sls. 913-888-5100
MD Baltimore, Eastern Comp. Sls. 301-788-7050
MA Millis, Schumacher & Yarrington, Inc. 617-376-2411
MI Ann Arbor, Frank E. Kahsar Sls. 313-769-0131
MN Minnetonka, J. P. & Assocs. 612-935-7930
MO St. Charles, Midwest Tech. Sls. 314-441-1012
NH Nashua, Schumacher & Yarrington, Inc. 603-882-2664
NM Albuquerque, C. T. Carlberg & Assocs. 505-836-1448
NY Clifton Pk., NET Sls. Co. 518-371-6864
NY Cortland, NET Sls. Co. 607-756-6592
NY De Ruyter, NET Sls. Co. 315-662-7996
NY Melville, Comtronic Assocs., Inc. 516-249-0505
NY Victor, NET Sls. Co. 716-924-1844
NC Charlotte, Over & Over Inc. 704-542-9111
NC Raleigh, Over & Over Inc. 919-782-9111
OH Cincinnati, Frank E. Kahsar Sls. 513-922-3133
OH Columbus, Frank E. Kahsar Sls. 614-252-4009
OH Mentor, Frank E. Kahsar Sls. 216-257-1166
OR Beaverton, JHS J. Backer Co. 503-627-0775
PA Sewickley, Frank E. Kahsar Sls. 412-741-4155
PA West Conshohocken, Eastern Comps. Sls. 215-825-8610
RI Warwick, Schumacher & Yarrington, Inc. 401-884-5671
TX Dallas, Rem Air Components Corp. 214-234-1069
UT Salt Lake City, Cluff & Assocs. 801-486-7297
WA Seattle, James J. Backer Co. 206-285-1300
Can Mississauga, Ont., John G. Weiss Co., Ltd. 416-673-0011
Can Nepean, Ont., John G. Weiss Co., Ltd. 613-825-0545
Can St. Laurent, Que., John G. Weiss Co., Ltd. 514-337-5022
Can Vancouver, B.C., John G. Weiss Co., Ltd. 604-873-1112
Can Winnipeg, Manitoba, John G. Weiss Co., Ltd. 204-949-1877

Local Distributors

AL Huntsville, Allied Elctrns. 205-721-3500
AL Huntsville, Powell Elctrns. 205-539-2731
AZ Phoenix, Dalis Elctrn. Supp. 602-275-2885
AZ Phoenix, Powell Elctrns. 602-938-5552
AZ Tempe, L Comp. Inc. 602-730-1633
AZ Tucson, Dalis Elctrn. Supp. 602-889-5301
AR Ft. Smith, Radio, Inc. 501-646-5200
AR Little Rock, Bluff City Elctrns. 501-376-7044
CA Costa Mesa, Eric Elctrns. 714-751-1185
CA Costa Mesa, Powell Elctrns. 714-754-1717
CA Fountain Valley, Components Ctr. 714-979-0433
CA Fremont, Allied Elctrns. 415-770-0590
CA Irvine, ITT Multicomps. 714-727-4001
CA Los Angeles, Electric Switches, Inc. 213-660-1310
CA Milpitas, Zack Elctrns. 415-326-5482
CA Monterey, Zack Elctrns. 408-375-3144
CA Sacramento, Zack Elctrns. 916-446-3131
CA San Diego, Mock III Sls. Co., Inc. 619-560-0515
CA San Diego, Shanks & Wright 619-239-0176
CA San Diego, Southland Comps. 619-578-6630
CA San Francisco, Zack Elctrns. 415-626-1444
CA San Jose, Eric Elctrns. 408-432-1111
CA San Jose, ITT Multicomps. 408-279-0685
CA San Jose, Powell Elctrns. 408-943-9020
CA San Jose, Rose Elctrn. Dist. Co. 408-943-0200
CA Santa Clara, Components Ctr. 408-988-3751
CA Torrance, Allied Elctrns. 213-373-6547
CA Tustin, Allied Elctrns. 714-669-4190
CA Tustin, Western Switches & Controls 714-259-8144
CA Vallejo, Zack Elctrns. 707-644-6676
CO Arvada, Denver Beta 303-431-7161
CO Aurora, Jet Elctrns. Supp. Co. 303-364-1000
CO Colorado Springs, Kimball Elctrns. 303-528-7066
CO Englewood, Allied Elctrns. 303-790-1664
CO Englewood, NEP Elctrns. 303-799-9898
CT Cheshire, Allied Elctrns. 203-272-7730
CT Danbury, Pilgrim Elctrns., Inc. 203-792-7274
CT Wallingford, Greene Shaw 203-265-3333
CT Wallingford, Midstate Elctrns. 203-265-9900
DE Milford, Harco Elctrns. 302-442-3105
DE Wilmington, Wholesale Elctrns. 302-652-3221
FL Altamonte Springs, Control Des. Supp., Inc. 305-788-3220
FL Bradenton, Dow Elctrns. 813-756-9571
FL Ft. Lauderdale, Bros. Elctrns. 305-561-6700
FL Ft. Lauderdale, Powell Elctrns. 305-484-8377
FL Ft. Meyers, Dow Elctrns. 813-334-6577
FL Gainesville, Dow Elctrns. 904-376-3231
FL Jacksonville, Dow Elctrns. 904-356-8426
FL Lakeland, Dow Elctrns. 813-686-8193
FL Largo, Allied Elctrns. 813-541-4660
FL Longwood, RM Elctrns. 407-862-9191
FL Maitland, Elctrn. Equip. 407-539-0888
FL Melbourne, Greene Shaw 407-951-3636
FL Miami, Electronic Equip. Co. 305-871-3500
FL Orlando, Dow Elctrns. 407-299-2771
FL Orlando, Wallace 407-841-0400
FL Pompano Bch., Allied Elctrns. 305-978-3008
FL Pompano Beach, Dow Elctrns. 305-975-5550
FL St. Petersburg, Dow Elctrns. 813-525-1131
FL Tampa, Dow Elctrns. 813-626-5191
FL Tampa, Dow Elctrns. 813-870-3315
FL Tampa, Elctrn. Equip. Co., Inc. 813-988-0810
FL West Palm Beach, Nurmi Elctrn. Supp., Inc. 305-686-8553
GA Albany, Dow Elctrns. 912-435-1711
GA Atlanta, Dow Elctrns. 404-446-3140
GA Augusta, Dixie Elctrns., Inc. 404-772-2055
GA Augusta, Dow Elctrns. 404-722-1526
GA Macon, Dow Elctrns. 912-743-5421
GA Marietta, Dow Elctrns. 404-422-4333
GA Norcross, Allied Elctrns. 404-446-8595
GA Norcross, Applied Power, Inc. 404-263-0421
GA Norcross, Dow Elctrns. 404-448-4004
GA Norcross, Spectrum Elctrns. 404-448-1516
GA Norcross, Whitehead Elctrns. 404-923-6667
GA Savannah, Dow Elctrns. 912-234-1684
ID Boise, Kimball Elctrns., Inc. 208-342-3559
ID Pocatello, Kimball Elctrns., Inc. 208-232-2201
IL Addison, Belford Elctrns. 312-691-1100
IL Addison, L Comp, Inc. 312-628-1400
IL Bensenville, Goold Elctrns. 312-860-7171
IL Chicago, Leeds Electro Comps. 312-625-3800
IL Des Plaines, Allied Elctrns. 312-803-1040
IL Elgin, Allied Elctrns. 312-697-8200
IL Geneva, Melvin Elctrns., Inc. 312-232-7300
IL Villa Park, Melvin Elctrns., Inc. 312-279-5015
IL Wheeling, Hawk Elctrns., Inc. 312-459-4030
IL Wood Dale, Nep Elctrns. 312-595-8500
IN Indianapolis, Allied Elctrns. 317-875-0448
IN Indianapolis, MAR Elctrns. 317-633-6699
IN Indianapolis, RM Elctrns. 317-291-7110
IA Sioux City, Molstad Distrbg. 712-255-8023
KS Great Bend, RSC Elctrns., Inc. 316-793-3507
KS Salina, RSC Elctrns., Inc. 913-823-6353
KS Wichita, Airtechnics, Inc. 316-267-2849
KS Wichita, L-Comp 316-265-5100
KS Wichita, Radio Inc. 316-264-2798
KS Wichita, RSC Elctrns., Inc. 316-267-5213
KY Florence, URI Elctrns., Inc. 606-371-4423
LA New Orleans, Southern Radio Supp. Co. 504-524-2343
MD Aberdeen, Harco Elctrns. 301-838-7990
MD Columbia, Allied Elctrns. 301-381-1560
MD Columbia, Powell Elctrns. 301-995-6410
MD Gaithersburg, Axis Elctrns., Inc. 301-840-9640
MD Kensington, Marine Air Supply Co. 301-949-9560
MD Marlow Hgts., Allied Elctrns. 301-423-0161
MA Avon, Controller Svc. & Sls. 617-584-9010
MA Billerica, Allied Elctrns. 508-667-8624
MA Boston, Controller Svc. & Sls. 617-269-1375
MA Newton, Greene Shaw 617-969-8900
MA Westborough, Powell Elctrns. 617-366-6100
MI Ann Arbor, Wedemeyer Elctrn. Supp. 313-665-8611
MI Grand Rapids, RM Elctrns. 616-531-9300
MI Lansing, Wedemeyer Elctrn. Supp. 517-484-9009
MI Livonia, Allied Elctrns. 313-462-0190
MI Novi, Belford Elctrns. 313-349-6842
MI St. Clair Shores, Spemco Switches 313-771-2700
MN Burnsville, Cassidy Elctrns. 612-895-9026
MN Eden Prairie, Allied Elctrns. 612-829-7554
MN Minneapolis, Stark Elctrns. Supp., Inc. 612-332-1325
MN Minneapolis, Tor Tec 612-866-3662
MS Columbus, Bluff City Elctrns. 601-328-6212
MS Tupelo, Bluff City Elctrns. 601-842-6832
MO Kansas City, L Comp., Inc. 816-221-2400
MO Maryland Hgts., L Comp., Inc. 314-291-6200
MO St. Louis, Franklin Elctrns. Co. 314-993-5333
NH Manchester, Controller Svc. & Sls. 603-623-7225
NJ E. Brunswick, Brothers Elctrns. 201-238-2200
NJ Englewood, Powell Elctrns. 201-894-0800
NJ Kenilworth, Federated Purchaser 201-272-0505
NJ Mt. Laurel, Allied Elctrns. 609-234-7769
NM Farmington, Farmington Wintronics 505-327-6356
NY Bohemia, Key Components 516-567-7500
NY Buffalo, Goldcrest Elctrns. 716-885-5878
NY Fairport, Allied Elctrns. 716-425-3850
NY Hempstead, Electronic Equip. Co. 516-538-5510
NY Mineola, Allied Elctrns. 516-248-2360
NY Mt. Vernon, QAR Industrial Elctrn. Sls., Inc. 914-699-2224
NY Rochester, Masline Elctrns., Inc. 716-546-5373
NY Rome, Rome Elctrns. 315-337-5400
NY Troy, Trojan Elctrn. Supp. Co. 518-274-4481
NY Yonkers, Kin-Tronics Inc. 914-968-7736
NC Cary, Powell Elctrns. 919-467-1212
NC Charlotte, Dixie Elctrns., Inc. 704-377-5413
NC Raleigh, Allied Elctrns. 919-876-5845
NC Raleigh, Resco 919-781-5700
NC Winston-Salem, Dixie Elctrns., Inc. 919-724-5961
OH Cincinnati, Schuster Elctrns. 513-489-1400
OH Cincinnati, URI Elctrns. 513-761-4030
OH Columbus, Wedemeyer Elctrn. Supp. Co., Inc. 614-436-9600
OH Columbus, Whitehead Elctrns. 614-224-4234
OH Dayton, Srepco 513-293-0871
OH Dayton, Whitehead Elctrns. 513-293-2947
OH Lima, LRP Elctrns. 419-228-1220
OH Solon, Allied Elctrns. 216-248-4200
OH Twinsburg, Schuster Elctrns. 216-425-8134
OH Warren, REM Elctrns. 216-373-1300
OK Enid, Enid Wintronic 405-234-2218
OK Lawton, Lawton Wintronic 405-355-0603
OK Oklahoma City, Radio, Inc. 405-789-0741
OK Oklahoma City, RSC Elctrns. 405-631-7729
OK Tulsa, Radio, Inc. 918-587-9123
OR Beaverton, Comp. Resources 503-641-8488
OR Beaverton, Norvac Elctrns. 503-644-1025
OR Beaverton, Rose Elctrn. Distr. 503-629-9288
OR Eugene, Norvac Elctrns. 503-345-2905
OR Portland, URS Elctrns. 503-233-7151
PA Allentown, Federated Purchaser 215-437-4481
PA Allentown, P. A. Peters Co. 215-434-5237
PA Allentown, Whlsle. Elctrns. 215-436-6743
PA Dunmore, P. A. Peters Co. 717-343-1146
PA Erie, Rem Elctrns. 814-453-5626
PA Lancaster, Harco Elctrns. 717-291-1861
PA N. Huntington, Rem Elctrns. 412-864-7423
PA Philadelphia, Brothers Elctrns. 215-425-7962
PA Philadelphia, Powell Elctrns. 215-365-1900
PA Pittsburgh, Allied Elctrns. 412-367-4124
PA Wayne, Peak Elctrns. 215-293-9000
RI Pawtucket, Major/Edwards Elec. Supp. 401-727-1430
RI Providence, Controller Svc. & Sls. 401-781-7100
SC Columbia, Dixie Elctrns. 803-779-5332
SC Greenville, Dixie Elctrns. 803-297-1430
SC N. Charleston, Dixie Elctrns. 803-552-2671
SC Taylors, Cantrell Whlse. Prods. 803-268-1194
TN Chattanooga, Dow Elctrns. 615-624-1040
TN Gray, Dixie Elctrns. 615-477-3838
TN Jackson, Bluff City Elctrns. 901-424-0236
TN Knoxville, Dixie Elctrns. 615-938-4131
TN Memphis, Bluff City Elctrns. 901-345-9500
TN Nashville, Bluff City Elctrns. 615-242-8000
TX Austin, Allied Elctrns. 512-389-3771
TX Austin, Southwest Elctrns. 512-837-8971
TX Austin, Wofford Elctrns. 512-339-1131
TX Brownsville, Carden Indl. Grp. 512-541-3660
TX Corpus Christi, Douglas Elctrns. 512-883-5103
TX Dallas, Allied Elctrns. 214-553-4370
TX Dallas, Off The Shelf Comps., Inc. 214-247-0052
TX Dallas, Southwest Elctrns. 214-234-3050
TX Dallas, Wallace Elctrns. 214-340-0400
TX El Paso, Midland Wintronic 915-779-8391
TX El Paso, Rem Elctrns. 915-778-7333
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Ft. Worth, Swieco, Inc. 817-335-6521

nkk switches OF AMERICA INC.
FULL LINE AUTHORIZED DISTRIBUTOR
E S I
ELECTRIC SWITCHES INCORPORATED
2478 Fletcher Dr., Los Angeles, California 90039-2897
Toll Call 800-421-8855 TEL:213-660-1310
CA:800-252-4640 FAX:213-660-5130
SEE COMPLETE PRODUCT LINE UNDER SWITCHES SECTION–5100. FREE CATALOG 31EM on REQUEST

TX	Houston, Wofford Elctrns.	713-847-3583
TX	Humble, Allied Elctrns.	713-446-8005
TX	Irving, Powell Elctrns.	214-550-0547
TX	Richardson, Off the Shelf Comps., Inc.	214-238-0808
TX	Richardson, RSC Elctrns.	214-644-3444
TX	Stafford, Southwest Elctrns.	713-240-4000
TX	Waco, Hargis Co.	817-754-5667
UT	Ogden, Ogden Wintronic	801-393-8603
UT	Salt Lake City, Ballard Supp. Corp.	801-972-2430
UT	Salt Lake City, Kimball Elctrns.	801-328-2075
UT	Salt Lake City, Salt Lake Beta	801-966-0236
UT	Salt Lake City, Std. Supp. Co.	801-486-3371
VA	Norfolk, Priest Elctrns.	804-855-0105
WA	Kent, Comp. Resources	206-251-9771
WA	Lacey, Powell Elctrns.	206-641-4446
WA	Redmond, Priebe Elctrns.	206-881-2363
WA	Seattle, Allied Elctrns.	206-547-2827
WA	Seattle, URS Elctrns.	206-451-9393
WI	Mequon, Taylor Elec. Co.	414-241-4321
WI	New Berlin, Allied Elctrns.	414-796-1280
WI	New Berlin, NEP Elctrns., Inc.	414-785-9100
WI	Oconomowoc, GW Elctrns., Ltd	414-367-6003
WI	Waukesha, Hawk Elctrns.	414-547-4457
Can	Burnaby, BC, ITT Multicomps.	604-291-8866
Can	Burnaby, BC, SEMAD	604-420-9889
Can	Calgary, Alberta, ITT Multicomps.	403-273-2780
Can	Calgary, Alberta, SEMAD	403-252-5664
Can	Concord, Ont, Trade Elctrns.	416-661-7111
Can	Concord, Ont., ITT Multicomps.	416-736-1588
Can	Dartmouth, NS, ITT Multicomps.	902-465-2350
Can	Edmonton, Alberta, ITT Multicomps.	403-451-4001
Can	Markham, Ont., SEMAD	416-475-8500
Can	Moncton, NB, ITT Multicomps.	506-857-8011
Can	Nepean, Ont., ITT Multicomps.	613-226-7406
Can	Ottawa, Ont., SEMAD	613-727-8325
Can	Pointe Claire, Que., SEMAD	514-694-0860
Can	Saskatoon, SK, ITT Multicomps.	306-373-7138
Can	St. Laurent, PQ, ITT Multicomps.	514-335-7697
Can	Winnipeg, Manitoba, ITT Multicomps.	204-786-8401

NKR PRECISION MANUFACTURING, Rte. 17M, Box 333, Harriman, NY 10926, Tel: 914-782-8562; Empl.: 17

NMB TECHNOLOGIES INCORPORATED

FAX: 818-341-8207

NMB TECHNOLOGIES, 9730 Independence Avenue, Chatsworth, CA 91311, Tel: 818-341-3355; *Dist. Mgr.:* Brian Lennox ..... **A•1768-1769; B•1288-1289, 1879; C•1680-1681**

Local Sales Offices & Reps

CA	Chatsworth, NMB Technlgs.	818-341-3355
CA	Santa Clara, NMB Technlgs.	408-727-2636
IL	Schaumburg, NMB Technlgs.	312-843-0202
PA	Easton, NMB Technlgs.	215-252-0616
RI	Providence, NMB Technlgs.	401-273-6900
TX	Grapevine, NMB Technlgs.	817-488-8445
Can	Mississauga, Ont., NMB Precision	416-890-0570

NOBEX DIV., Griffith Plastics Corp., 1027 California Dr., Box 4365, Burlingame, CA 94010, Tel: 415-342-8170; FSC No.: 32767; Empl.: 35

NOBLE U.S.A., INC., 5450 Meadowbrook Ct., Rolling Meadows, IL 60008, Tel: 312-364-6038, TELEX: 206745, FAX: 1-312-364-6045; *Sls. Mgr.:* Robert K. Burdick; *Dist. Mgr.:* Vyto Omilijonas

NOHAU CORPORATION, 51 E. Campbell Ave., Campbell, CA 95008, Tel: 408-866-1820, 408-866-4493, FAX: 408-378-7869 ..... **D•1324-1326**

Local Sales Offices & Reps

CA	San Diego, Microware Technlg. Inc.	619-693-4280

NOKIA-MOBIRA, Sub. of the Nokia Corp.-Helsinki, 2300 Tall Pines Drive, Largo, FL 34641, Tel: 813-536-5553; Empl.: 4,000; *Sls. Mgr.:* P. Chelgren

NOLATRON, P.O. Box 4042, Harrisburg, PA 17111, Tel: 717-564-3398, FAX: 717-939-5831; Empl.: 5

NOLL, J. A. CO., P.O. Box 312, Monroeville, PA 15146, Tel: 412-733-1089; *Sls. Mgr.:* P. Carson; *Dist. Mgr.:* P. Carson

NON-LINEAR SYSTEMS/DIV. OF KAYPRO CORP., 533 Stevens Ave., Solana Bch., CA 92075, Tel: 619-481-3953, TWX: 510-6005081, FAX: 619-755-6029; FSC No.: 03626; Empl.: 55; *Sls. Mgr.:* Ben W. Fisher; *Dist. Mgr.:* Jeanne Simmons

NORDION INTERNATIONAL, P.O. Box 13500, Kanata, Ontario, Canada K2K 1X8, Tel: 613-592-2790, TELEX: 053-4162, FAX: 613-592-6937

NORELCOM INDS., 63 Marine St., Farmingdale, NY 11735, Tel: 516-249-7245, FAX: 516-249-3745; Empl.: 30

NOREN PRODUCTS INC., 1010 O'Brien Blvd., Menlo Pk., CA 94025, Tel: 415-322-9500, TELEX: 17-1410 Noren MNPK, FAX: 415-324-1348

NORGREN, 5400 South Delaware, Littleton, CO 80120-1663, Tel: 303-794-2611, TELEX: 45541; Empl.: 661; *Sls. Mgr.:* Patrick Maley

NORITAKE CO., INC., Noritake Co., Limited (Japan), 23820 Hawthorne Blvd., Ste. 100, Torrance, CA 90505, Tel: 213-373-6704; FSC No.: 213-772-3918; Empl.: 7; *Sls. Mgr.:* Y. Tatsuta

NORLAND CORPORATION, Norland Dr., Ft. Atkinson, WI 53538, Tel: 414-563-8456, TELEX: 25-1776; Empl.: 105; *Sls. Mgr.:* Robert Millar

NORPLEX/OAK INC., Allied-Signal Inc., P.O. Box 1448, La Crosse, WI 54602-1448, Tel: 608-784-6070, TELEX: 59-2257; Empl.: 2,200; *Sls. Mgr.:* George Gabuzda

NORSAL INDUSTRIES, 85 D Hoffman Lane S., Central Islip, NY 11722, Tel: 516-234-1200, TWX: 510-234-1200, FAX: 516-234-1589; Empl.: 45; *Sls. Mgr.:* Marc Spector

NORTH AMERICAN PHILIPS CONTROLS CORP., See Airpax Corporation, Cheshire Div.

NORTH AMERICAN PHILIPS LIGHTING, Bank St., Hightstown, NJ 08520, Tel: 609-448-4000, TWX: 510-685-5651; Empl.: 600; *Sls. Mgr.:* C. J. Lehmann

NORTH ATLANTIC INDUSTRIES, 60 Plant Ave., Hauppauge, NY 11788, Tel: 516-582-6500, TWX: 510-227-9660, FAX: 516-582-8079; FSC No.: 07342; Empl.: 320; *Sls. Mgr.:* George H. Inhofer ..... **D•1328-1329**

Local Sales Offices & Reps

AL	Huntsville, Teqspec, Inc.	205-883-6699
AZ	Tempe, Trembly Assoc.	602-967-2058
CA	Carson, Tritek Solutions, Inc.	213-515-1590
CO	Wheat Ridge, Trembly Assoc.	303-421-8900
FL	Cocoa Beach, TeqSpec	305-783-3444
FL	Palm Harbor, Teqspec	813-785-2276
GA	Snellville, Teqspec	404-972-7955
IL	Chicago, Pat Lind Elctrns.	312-726-3513
IN	Indianapolis, Pat Lind Elctrns.	317-632-7444
IA	Cedar Rapids, Palatine Engrg.	319-365-8071
MA	Burlington, Intersell	617-273-3844
MI	Madison Heights, WKM Assoc.	313-588-2300
MN	Circle Pines, P. Lind	612-786-5770
MO	Florissant, Palatine Engrg.	314-839-0800
NV	Las Vegas, Trembly Assoc.	702-739-9770
NJ	Teaneck, Sci. Dvcs.-East	201-837-1004
NM	Albuquerque, Trembly Assoc.	505-266-8616
NY	Saugerties, Beckpep, Inc.	914-246-3031
NC	Winston-Salem, Teqspec III	919-765-5553
OH	Dayton, WKM Assoc.	513-434-7500
OR	Wilsonville, Syntek	503-636-6793
PA	Horsham, Pennsylvania Sci. Dvcs.	215-956-0700
TX	Houston, Scientific Sls.	713-645-6218
TX	Richardson, Sci. Sls.	214-231-6541
UT	N. Salt Lake City, Trembly Assoc.	801-295-4703
WI	Milwaukee, Pat Lind Elctrns.	414-224-0146
Can	Scarborough, Ont., John DeGroot Assocs.	416-431-9331

NORTHEAST INNOVATIONS, INC., P.O. Box 120, Concord, NH 03302, Tel: 603-736-8260, FAX: 603-736-4506; Empl.: 10; *Sls. Mgr.:* James P. Diggins; *Dist. Mgr.:* Mr. Ryan Irving

NORTHEAST SCIENTIFIC CORP., 30 Wetherbee St., Acton, MA 01720, Tel: 508-263-2711; Empl.: 10; *Sls. Mgr.:* C. Moritz

NORTHERN AMPOWER CORPORATION, 47087 Grand River Avenue, Novi, MI 48050, Tel: 313-349-4860, FAX: 313-344-2575; Empl.: 35; *Sls. Mgr.:* Ronald E. Kirsch

NORTHERN MAGNETICS INC., 16124 Wyandotte, Van Nuys, CA 91406, Tel: 818-997-8675, FAX: 818-997-3935; Empl.: 12

NORTHERN PRECISION LABS., 11 Madison Rd., Fairfield, NJ 07006, Tel: 201-227-4800, FAX: 201-575-5973; Empl.: 95; *Sls. Mgr.:* P. Pytal

North Hills Electronics, Inc.

FAX: 516-759-3327

NORTH HILLS ELECTRONICS, 1 Alexander Pl, Glen Cove, NY 11542, Tel: 516-671-5700, TELEX: 46-6886; FSC No.: 98821; Empl.: 125; *Sls. Mgr.:* Herb Marx ..... **A•2364-2368; D•1930-1933**

Local Sales Offices & Reps

AL	Huntsville, Rakes Eng. & Mktg.	205-533-3763
AZ	Phoenix, Mercury Eng. Sls.	602-265-0344
CA	North Palo Alto, Tri-Rep	415-965-1822
CA	Palo Alto, Tri Rep	415-965-1822
CA	South El Toro, Par Mktg.	714-768-6021
CT	Wethersfield, Underwood Sls. Corp.	203-563-3046
FL	Clearwater, Brennan Assocs.	813-446-5006
GA	Atlanta, Remco	404-447-6937
IL	Wheaton, Vine Tech. Sls.	913-642-7220
MD	Laurel, CSDS	301-953-7884
MA	Lowell, Underwood Sls. Corp.	617-256-8191
MN	Minneapolis, Hei-Lite Sls.	612-861-6051
MO	St. Louis, Thunderbird Tech. Sls.	314-298-8984
NJ	Glen Gardner, F & M Tech. Sls.	201-832-7216
NY	Albertson, DOL Engrg.	516-747-3944
OH	Dayton, Mid-Con Elctrns.	513-837-2643
OR	Portland, Evergreen Mktg. Grp.	503-643-8020
TX	Dallas, Milestek, Inc.	817-455-7444
TX	Houston, Milestek, Inc.	713-376-6776
WA	Seattle, Evergreen Mktg. Grp.	206-633-3160
WI	Genoa City, Vine Tech. Sls.	414-279-3871
Can	Montreal, Componetics Ltd.	514-331-9930

NORTH HILLS ELECTRONICS INC., Power Products Div., 1 Alexander Place, Glen Cove, NY 11542-3796, Tel: 516-671-5700, TELEX: 46-6886 NOHILL CI, FAX: 516-759-3327; Empl.: 135; *Sls. Mgr.:* Jay M. Mohr

NORTHLAKE ENGINEERING, INC., 999 Anita Ave., Antioch, IL 60002, Tel: 312-395-5710, FAX: 312-395-9101; FSC No.: 50638; Empl.: 120; *Sls. Mgr.:* W. A. Hardt

NORTHWEST MICROCIRCUITS, INC., 5464SW Philomath Blvd., Corvallis, OR 97333, Tel: 503-753-8242; Empl.: 15; *Sls. Mgr.:* Wm. H. Ferwalt

Local Sales Offices & Reps

MN	Minneapolis, E.P.M. Inc.	612-434-9446

NORTON ASSOCIATES, INC., 557 Oak St., Copiague, NY 11726, Tel: 516-842-4666, FAX: 516-842-4667; FSC No.: 08739

NOVA ELECTRIC INC., 263 Hillside Ave., Nutley, NJ 07110, Tel: 201-661-3434, TELEX: 427386, FAX: 201-661-3926; FSC No.: 29019; Empl.: 50; *Sls. Mgr.:* Kenneth Niovitch ..... **D•2216-2217**

Local Sales Offices & Reps

CA	Covina, Synertek	818-915-1439
FL	Orlando, Carter Assocs.	407-260-5566
HI	Honolulu, Victor Kim Elctrns.	808-841-6266
MD	Rockville, Marktron	301-251-8990
MA	Burlington, Tricom	617-272-8163
NJ	Nutley, Nova Elec. Sls.	201-661-3434
TX	Garland, Carey-McMahill	214-681-1414
UT	Salt Lake City, Computer Environments	801-466-6002
Can	N. Vancouver, B.C., Interworld Elctrns.	604-984-4471

NOVATEK CORPORATION, 900 East Atlantic Blvd., Pompano Beach, FL 33060, Tel: 305-782-4397, TELEX: 522600 AAA EXECT, FAX: 305-971-0316; Empl.: 5; *Sls. Mgr.:* Joe DiBrigida

NOVA TRAN, Union Carbide Corp., 100 Deposition Dr., Clear Lake, WI 54005, Tel: 800-554-1697, FAX: 715-263-3189; *Sls. Mgr.:* Paul McGuire

NOVATRONICS, Box 878, Pompano Beach, FL 33061, Tel: 305-942-5200, TWX: 510-956-9878, FAX: 305-776-7147; Empl.: 460; *Sls. Mgr.:* Joseph P. Muni

NOVATRONICS INC., 677 Erie St., P.O. Box 610, Stratford, Ontario, Canada N5A 6V6, Tel: 519-271-3880, TELEX: 06-955394, FAX: 519-271-9781; Empl.: 100; *Sls. Mgr.:* Laraine Murray

NOVOTECHNIK U.S., INC., 237 Cedar Hill St., Marlborough, MA 01752, Tel: 617-485-2244, FAX: 617-485-2430; FSC No.: MULTIPLE; Empl.: 5

NRD INC., Subsidiary of Mark IV Inds., Inc., 2937 Alt Blvd. N, Grand Island, NY 14072, Tel: 716-773-7634, TELEX: 91578 NRD GRDI, FAX: 716-773-7744; Empl.: 100; *Sls. Mgr.:* James R. Curtis; *Dist. Mgr.:* Larry Keating ..... **D•2244**

Local Sales Offices & Reps

CA	Santa Clara, Tech-Ser, Inc.	408-496-1004
CA	Torrance, Tech-Ser, Inc.	213-370-7200
IL	Chicago, MGA Kokomo	312-775-1151
FL	Kokomo, MGA Kokomo	317-455-0444
MA	Salem, Alpha-Stat	508-744-1100
MI	Southfield, M. Gottlieb Assoc.,Inc.	313-358-4151
MN	Edina, Omni-Tec	612-881-4447
MO	Liberty, Lectro-Reps	816-781-2522
NY	Rochester, TCS	716-342-2406
NC	Charlotte, Electro-Rep Assocs.	704-527-2530
PA	Fensterville, ARC Assocs.	215-364-1050
TX	Dallas, Scalon, Hughes & Assocs.	214-739-2888

NTE ELECTRONICS, INC., 44 Farrand St., Bloomfield, NJ 07003, Tel: 201-748-5089, FAX: 201-748-6224; FSC No.: 7T184; Empl.: 60; *Sls. Mgr.:* Cindy Habick; *Dist. Mgr.:* Mary Damiano

NTK

FAX: 201-467-5794

NTK TECHNICAL CERAMICS, NGK Spark Plugs (USA), Inc., 99 Morris Ave., Springfield, NJ 07081, Tel: 201-376-6070, TELEX: 95-246-1286; FSC No.: 95-246-1286; *Sls. Mgr.:* Mark Ota; *Dist. Mgr.:* Earl Hanson ..... **A•1710-1714, 1853**

Local Sales Offices & Reps

AZ	Mesa, NTK Tech. Ceramic	602-820-4900
FL	Longwood, D-Assocs.	305-830-8976
FL	Maitland, D. J. Ellis & Assocs., Inc.	305-645-1101
FL	Maitland, D. J. Ellis Assocs.	305-645-1101
FL	Maitland, D.J. Ellis & Assocs. Inc.	305-645-1101
GA	Atlanta, L&D Inc.	404-455-3483
IL	Chicago, Greenslade Sls.	312-593-3450
IL	Chicago, NTK Tech. Ceramic	312-390-8240
IN	Ft. Wayne, T.X. Sls.	219-489-4447
IA	Cedar Rapids, Barnes Wes Tech	319-393-9790
IA	Chanhassen, Barnes Sls. Assocs.	612-934-2907
KS	Overland Park, Barnes Midwest	913-469-9688
MI	Ann Arbor, Jordan-Elliott Sls. Inc.	313-662-4087
MI	Jackson, Jordan-Elliottt Inc.	517-788-8353
MN	Chanhassen, Barnes Sales Assocs.	612-934-2907
NJ	Springfield, NTK Tech. Ceramic	201-376-6070
TX	Dallas, NTK Tech. Ceramic	214-404-1173
Can	Ontario, NGK Spark Plugs Canada	416-291-9746

NT.T/WAVECONN, State Rd. Hill, Meadville, PA 16335, Tel: 800-535-3162, 914-591-4173, FAX: 914-591-7783; Empl.: 100; *Sls. Mgr.:* Sigmund Jay Silberstein

NUCLEAR RESEARCH CORP., 125 Titus Ave., Box H, Warrington, PA 18976, Tel: 215-343-5900, TELEX: 510-665-8525 NRC WNTN, FAX: 215-343-4670; FSC No.: 96696; Empl.: 130; *Sls. Mgr.:* Jim Fannon

NUCLEONIC PRODS., See Thomson-CSF Comps. Corp., Passive Comps. Div.

NU-CONCEPT SYSTEMS, 2725 Advance La.,P. O. Box 587, Colmar, PA 18915, Tel: 215-822-8400, FAX: 215-822-1427; FSC No.: 58561; Empl.: 17; *Sls. Mgr.:* Robert F. Scheuerle

NU DATA, INC., 32 Fairview Ave., Little Silver, NJ 07739, Tel: 201-842-5757, TELEX: 271139, FAX: 201-842-1161; Empl.: 22; *Sls. Mgr.:* Richard A. Previte

NUMERIX CORP., 20 Ossipee Rd., Newton, MA 02164, Tel: 617-964-2500, TELEX: 948032, FAX: 617-969-4380

NU-METRICS INC., Cedar Valley Bldg., Box 471, Vanderbilt, PA 15486, Tel: 412-628-6370, 800-346-2025, FAX: 412-628-8875; Empl.: 12; *Sls. Mgr.:* Bernie Ames

NWL CAPACITORS, NWL Transformers, 8050 Monetary Dr., Riviera Bch., FL 33404, Tel: 305-848-9009, FAX: 407-848-9011; Empl.: 20 ..... **A•1146-1147**

NWL TRANSFORMERS, Rising Sun Rd., P.O. Box 358, Bordentown, NJ 08505, Tel: 609-298-7300, TWX: 510-685-3645, FAX: 609-298-1982; Empl.: 225; *Sls. Mgr.:* C. W. Harrison ..... **A•2371; D•1929**

WILLIAM F. NYE, INC., P.O. Box G-927, New Bedford, MA 02742-0927, Tel: 508-996-6721, TELEX: 940807, FAX: 508-997-5285; Empl.: 24; *Sls. Mgr.:* Donald R. Fairbanks

NYLON MOLDING CORP., 1617 S. California, Monrovia, CA 91016, Tel: 818-358-2305, TELEX: 362391, FAX: 818-303-6085; Empl.: 45; *Sls. Mgr.:* Gary Fraze

Nytronics Components Group

FAX: 803-393-5421 (x362)

NYTRONICS COMPONENTS GRP., INC., 700 Orange St., Darlington, SC 29532, Tel: 803-393-5421, TWX: 810-665-2182; FSC No.: 83125; Empl.: 502; *Sls. Mgr.:* Mack W. Windham ..... **A•1148-1161, 1196, 1254-1275, 1604-1610, 2001; B•1024**

Local Sales Offices & Reps

AL	Huntsville, B.C.I.	205-529-4411
AZ	Tucson, Clemick & Assocs.	602-749-4003
CA	Los Angeles, MG Sls.	213-476-3113
CA	Sunnyvale, W.W. Posey	408-746-0771
CO	Englewood, Component Sls.	303-779-8060
CT	Bloomfield, FSI	203-243-3122
FL	Longwood, Beacon	305-332-1940
GA	Chamblee, B.C.I.	404-455-0405
IL	Glendale Hgts., Beta	312-790-9886
IN	Indianapolis, EMCI	317-921-3450
KS	Lenexa, Mid-Tec Assoc.	913-541-0505
MA	Needham, FSI	617-449-7920
MI	Ann Arbor, Kahsar Sls., Inc.	313-769-0131
MN	Edina, Dunlop Consits.	612-933-9070
MO	St. Louis, Mid-Tec Assoc.	314-275-8666
NJ	W. Caldwell, Grimm, Siegel	201-575-9300
NJ	West Orange, National Atlantic	201-731-0730
NY	Pittsford, W.A. Franklin Sls.	716-248-8251
OH	Cincinnati, Kahsar Sls., Inc.	513-922-3133
OH	Columbus, Kahsar Sls., Inc.	614-252-4009
OR	Tigard, Eltech, Inc.	503-684-3458
PA	Narberth, Bresson Assocs.	215-664-6460
TX	Houston, Texoma	713-462-1432
TX	Richardson, Texoma	214-238-8127
UT	Salt Lake City, Component Sls.	801-268-8440
VA	Forest, Bresson Assocs.	804-525-7445
WA	Bellevue, Eltec	206-643-4330
WI	Milwaukee, Beta	414-543-6609
Can	Nepean, Ont., Dynasty Elctrns.	613-723-0725

Local Distributors

CA	Garden Grove, Inductive Prods.	714-891-2572
CA	Gardena, Bell Inds.	213-515-1800
CA	San Diego, Mock III	619-560-0515
CA	San Diego, Neumann Elctrns.	619-695-3005
CA	Santa Clara, Cypress	408-980-2500
CA	Sunnyvale, Bell Inds.	408-734-8570
CA	Thousand Oaks, Bell	805-499-6821
CA	Walnut, A. C. I.	818-331-0735
CO	Englewood, Industrial Elctrns.	303-694-9444
CO	Wheatridge, Bell Inds.	303-424-1985
IL	Chicago, Bell Inds.	312-982-9210
IL	Chicago, Newark Elect.	312-638-4411
IN	Indianapolis, Bell Inds.	317-634-8202
MD	Beltsville, Newark Elec.	301-937-5085
MD	White Marsh, RESCO/Baltimore	301-529-0500
MA	Needham, Cronin Elctrns.	617-449-5000
MA	Woburn, Sterling Elec.	617-938-6200
MN	Minneapolis, Joel Co.	612-545-5669
NY	Farmingdale, Pride Elctrns.	516-293-4020
NY	Hauppauge, Fairmont Elctrns.	516-231-3313
NY	Hauppauge, Jaco Elect.	516-273-5500
NY	Plainview, ACI Elect.	516-293-6630
NY	Rome, Rome Elect.	315-337-5400
NC	Raleigh, Radio Elec. Svc.	919-781-5700
OH	Centerville, C.V. Clark	513-435-3000
OR	Lake Oswego, Bell Inds.	503-241-4115
PA	Montgomeryville, Pyttronic Inds.	215-643-2850
PA	Philadelphia, Herback Rademan	215-426-1700
PA	Philadelphia, PEI	215-568-7400
PA	York, E. C. I.	717-843-8971
TX	Dallas, Wholesale Elect.	214-824-3001
WA	Bellevue, Bell Inds.	206-747-1515

OAK Switch Systems Inc.

FAX: 815-459-5000 (x2218)

OAK SWITCH SYSTEMS, 100 S. Main St., Crystal Lake, IL 60014, Tel: 815-459-5000; FSC No.: 76854; Empl.: 500; *Dist. Mgr.:* Gary LeMaire ..... **B•1822, 1880**

Local Sales Offices & Reps

AL	Huntsville, Electramark, Inc.	205-830-4400
AZ	Scottsdale, Harris & Croy	602-951-9121
CA	Granada Hills, C & N & Assocs., Inc.	805-254-5844
CA	Walnut Creek, Tech-Rep Assocs.	415-934-8028
FL	Clearwater, Tech-Rep Associates	813-572-9900
FL	Winter Springs, Tech Rep Associates	407-699-4010
GA	Norcross, Electramark, Inc.	404-446-7915
IL	Crystal Lake, Oak Switch Sys. Inc.	815-459-5000
IL	Palatine, Golbeck/Milota	312-705-0602
IA	Cedar Rapids, Pattison Sls.	319-395-9866
KS	Olathe, C-Tron, Inc.	913-829-0073
MA	Acton, Boston Elctrns. Assocs.	508-264-4456
MI	White Pigeon, Oak Switch Sys. Inc.	616-483-7179
MN	Bloomington, Horizon Technologies	612-884-6515
MO	St. Charles, C-Tron	314-928-8078
NV	Las Vegas, Harris & Croy Inc.	702-876-5022
NJ	Cherry Hill, Eastern Elctrns.	609-662-2113
NJ	Mountainside, Henry G. Richter	201-233-4615
NM	Albuquerque, Harris & Croy Inc.	505-275-9103
NY	Fayetteville, Henry G. Richter	315-637-6713
NC	Raleigh, Eastern Elctrns.	919-876-7591
OH	Cincinnati, JMK Elctrns.	513-271-3860
OH	Cleveland, JMK Elctrns.	216-886-7100
OR	Tigard, Matrix Sls. & Mktg.	503-639-0325
PA	Phoenixville, Henry G. Richter	215-495-6176
TX	Dallas, Dal/Tex Rep., Inc.	214-991-7799
WA	Seattle, Rep-West	206-283-8351
Can	Don Mills, Ont., R. D. Assocs.	416-444-0959

Local Distributors

AL	Huntsville, Component Distr.	205-883-7501
AL	Huntsville, Marshall Elctrns.	205-881-9235
AZ	Phoenix, Marshall Elctrns.	602-496-0290
AZ	Scottsdale, Harper SID	800-442-7737
CA	Chatsworth, Marshall Elctrns.	818-407-4100
CA	Compton, Harper SID	213-979-5090
CA	Inglewood, Newark Elctrns.	213-671-7066
CA	Irvine, Marshall Elctrns.	714-859-5050
CA	Milpitas, Marshall Elctrns.	408-943-4600
CA	Mountain View, I/O Sls. Inc.	415-968-1080
CA	Rancho Cordova, Marshall Elctrns.	916-635-9700
CA	Sacramento, Zack Electronics	916-446-3131
CA	San Diego, Harper SID	619-578-2500
CA	San Diego, Marshall Elctrns.	619-578-9600
CA	San Francisco, Zack Elctrns.	415-626-1444
CA	Sunnyvale, Bell Ind.	408-734-8570
CO	Denver, CSID	303-292-9594
CO	Denver, Newark Elctrns.	303-757-3351
CO	Englewood, Component Distrs.	303-799-4916
CO	Thornton, Marshall Elctrns.	303-451-8383
CT	Wallingford, Marshall Elctrns.	203-265-3822
FL	Altamonte Springs, Marshall Elctrns.	305-767-8585
FL	Ft. Lauderdale, Marshall Elctrns.	305-977-4880
FL	Melbourne, Component Distr.	305-724-9910
FL	W. Palm Bch., Wings Electro Sls. Co.	407-798-6606
GA	Norcross, Component Distr.	404-441-3320
GA	Norcross, Marshall Elctrns.	404-923-5750
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Crystal Lake, Sub-Sem, Inc.	815-459-4139
IL	Palatine, Ohm/Elctrns.	312-359-5500
IL	Rosemont, Advent Elctrns.	312-297-6200
IL	Schaumburg, Marshall Elctrns.	312-490-0155
IL	Urbana, Bell Ind.	217-328-1077
IN	Indianapolis, Advent Elctrns.	317-874-2190
IN	Indianapolis, Bell Ind.	317-875-8200
IN	Indianapolis, Marshall Elctrns.	317-297-0483
KS	Edwardsville, C. Tennant Co.	913-441-1801
KS	Lenexa, Marshall Elctrns.	913-492-3121
MD	Silver Spring, Marshall Elctrns.	301-622-1118
MA	Canton, Impact Sls.	617-821-1500
MA	Westborough, In-Stock Prods.	508-870-5750
MA	Wilmington, Marshall Elctrns.	508-658-0810
MI	Farmington Hills, Advent Elctrns.	313-477-1650
MI	Livonia, Marshall Elctrns.	313-525-5850
MI	Oak Park, Newark Elctrns.	313-967-0600
MN	Minneapolis, Berquist	800-328-3882
MN	Minneapolis, Newark Elctrns.	612-331-6350
MN	Plymouth, Marshall Elctrns.	612-559-2211
MO	Maryland Hts., Olive Elctrns.	314-997-7709
NJ	Fairfield, Marshall Elctrns.	201-882-0320
NJ	Mt. Laurel, Marshall Elctrns.	609-234-9100
NJ	Springfield, Route Elctrns.	201-379-7710
NM	Albuquerque, Walker Radio	505-883-2992
NY	East Syracuse, Add/ Modutek	315-437-1852
NY	Hauppauge, Fairmont Elec.	516-231-3313
NY	Hauppauge, Marshall Elctrns.	516-273-2424
NY	Jamaica, Calson Co.	718-525-5900
NY	Johnson City, Marshall Elctrns.	607-798-1611
NY	Northport, Coke-el Aerospace Co.	516-754-2233
NY	Rochester, Marshall Elctrns.	716-235-7620
NC	Raleigh, Component Distr.	919-787-7311
NC	Raleigh, Marshall Elctrns.	919-878-9882
OH	Centerville, IPD	513-435-2086
OH	Dayton, Marshall Elctrns.	513-898-4480
OH	Solon, Marshall Elctrns.	216-248-1788
OH	Westerville, Marshall Elctrns.	614-891-7580

OR Beaverton, Marshall Elctrns. 503-644-5050
OR Portland, Radar Elec. 503-232-3404
PA Pittsburgh, Marshall Elctrns. 412-963-0441
TX Austin, Marshall Elctrns. 512-837-1991
TX Carrollton, Marshall Elctrns. 214-233-5200
TX Dallas, Component Distr. 214-644-0373
TX El Paso, Ideal Indl. Elect. 915-779-6647
TX Garland, Newark Elctrns. 214-494-5911
TX Houston, Marshall Elctrns. 713-895-9200
TX Irving, Harper S. I. D. 214-621-0500
UT Salt Lake City, Marshall Elctrns. 801-485-1551
WA Bothell, Marshall Elctrns. 206-486-5747
WA Seattle, Radar Elec. 206-282-2511
WA Spokane, Radar Elec. 509-747-3053
WI Waukesha, Marshall Elctrns. 414-797-8400
Can Burnaby, B.C., Semad Elctrn. Dist. 604-438-2515
Can Calgary, Alberta, Semad Elctrn. Dist. .. 403-252-5664
Can Downsview, Ont., Westburne Elctrns. 416-635-2980
Can Markham, Ont., Semad Elctrn. Dist. 416-475-3922
Can Ottawa, Ont., Semad Elctrn. Dist. 613-727-8325
Can Ottawa, Ont., Westburne Elctrns. 613-737-5570
Can Pointe Claire,Quebec, Semad Elctrn. Dist. 514-694-0860
Can Winnipeg, Manitoba, Westburne Industrial Ent. 204-786-4451
AZ Tucson, Harris & Croy Inc. 602-882-8642

OAKTRON MANUFACTURING, INC., 704 30th St, Monroe, WI 53566, Tel: 608-328-5560, TELEX: 260-266, FAX: 608-328-5575; FSC No.: 07109; Empl.: 100; *Sls. Mgr.:* J. F. Disch

OAL ASSOCIATES, INC., P.O. Box J, Escondido, CA 92025, Tel: 619-743-7143, FAX: 619-743-2460; Empl.: 18; *Sls. Mgr.:* Mark Lohkemper

OAS INC., See Optimum Applied Systems

OCEAN MARINE INSTRUMENT, P. O. Box 3963, Tustin, CA 92680, Tel: 714-832-4627

OCEAN STATE THERMOTICS, INC., 27 Thurber Blvd., Smithfield, RI 02917, Tel: 401-231-4640, FAX: 401-231-4641; Empl.: 50; *Sls. Mgr.:* Stephen R. Hecht; *Dist. Mgr.:* Stephen R. Hecht

OCTAGON SYSTEMS, 6510 W. 91st Ave., Westminster, CO 80030, Tel: 303-426-8540, TELEX: 4931919

OCULAR INC., 1701 N. Collins Ste. 330, Richardson, TX 75080, Tel: 214-437-2561, FAX: 214-437-2562; Empl.: 80; *Sls. Mgr.:* Ben Kwong ..... **B•1099-1101**

Local Sales Offices & Reps
NJ Wayne, Breen Assocs. 201-696-8683
RI Warren, William Poisson & Assocs. 401-245-0260
TX Dallas, Component Technlg. 214-783-8831
WA Federal Way, K.R. Jensen Sls. Co. 206-874-2772

ODELL, M. P., CO., 1620 Chesapeake Dr., Hoffman Estates, IL 60195, Tel: 312-991-2828; *Sls. Mgr.:* Maria McClurkin

OECO CORP., 4607 S.E. International Way, Milwaukie, OR 97222, Tel: 503-659-7932, TELEX: 36-0350, FAX: 503-653-6310; FSC No.: 95266; *Sls. Mgr.:* Dave Fuller, VP Sls.

OGALLALA ELCTRNS., Div. Arnold Engrg. Co., Box 59, Ogallala, NE 69153, Tel: 308-284-4093, FAX: 308-284-4093 (ext 29); Empl.: 39; *Sls. Mgr.:* H. L. Harrington

BRILL ELECTRONICS
(415) 834-5888
610 E. 10th St., Oakland, CA 94606
OHMITE
(213) 452-8002
1220 Olympic Bl., Santa Monica, CA 90404

OSI

FAX: 614-486-0743

OHIO SEMITRONICS, INC., 1205 Chesapeake Ave., Columbus, OH 43212, Tel: 614-486-9561; FSC No.: 12066; Empl.: 47; *Sls. Mgr.:* G. Clagett .. **B•1968-1986; D•1330**

Local Sales Offices & Reps
AZ Tucson, Sheldon Equip. 602-722-1452
CA Arcadia, Van Gott & Assocs. 818-445-9728
CA Fremont, FLW, Inc. 415-651-6511
CT Wallingford, Pat Jenks Assocs. 203-265-9939
FL Orlando, Datarep 407-843-5224
GA Marietta, FLW 404-424-1731
IL Park Ridge, Elctrn. Instr. Assocs. 312-298-2290
IL Waterloo, R.L. Weisheimer & Assocs. 314-487-7328
MD Baltimore, Electra-Tech, Inc. 301-877-8344
MA Beverly, Pat Jenks Assocs. 508-921-4600
MI Milford, TMS 313-360-1514
MN Minneapolis, The Mark Co. 612-933-3026
NJ Garwood, E.R. Mertz, Inc. 201-232-4643
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OH Dayton, Mohawk Intronics 513-434-8873
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OR Portland, Topp Engrg. Sls. Corp. 503-244-7265
PA Frazier, FLW, PA, Inc. 215-251-9700
PA Monroeville, TMS 412-776-1666
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WA Bellevue, Topp Engrg. Sls. Corp. 206-747-5400

FAX: 312-675-1505

OHMITE MANUFACTURING CO., 3601 W. Howard St., Skokie, IL 60076, Tel: 312-675-2600, TELEX: 72-4433, TWX: 910-223-0805; FSC No.: 44655 ..... **A•2003-2019, 2138-2139**

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IL Downers Grove, Richmar Elctrns. 312-968-0118
IN Ft. Wayne, John F. Kilfoil Co. 219-436-7233
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MA Sterling, Compatible Comps., Inc. 617-422-7641
MI Jackson, T.P.S. & Assocs. 517-783-1722
MN Minneapolis, Dunlop Consits. 612-544-1070
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NY Chappaqua, Micrel, Inc. 914-238-4961
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OH Wooster, T.P.S. & Assocs. 216-264-0971
OR Beaverton, Eclipse Mktg. Grp. 503-642-1661
PA Wynnewood, Metz-Benham Assocs., Inc. 215-896-7300
TX Richardson, Pro-Comp Sls. Co. 214-669-1500
UT Salt Lake City, West, Inc. 801-466-5739
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OK INDUSTRIES, INC., 4 Executive Plaza, Yonkers, NY 10701, Tel: 914-969-6800, TELEX: 12-5091; Empl.: 200; *Sls. Mgr.:* John Malboeuf

OKONITE CO., Box 340, Ramsey, NJ 07446, Tel: 201-825-0300, TWX: 710-988-1017; Empl.: 1700; *Sls. Mgr.:* F. R. Postma

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OMNIPRINT, INC., 1188 Elko Drive, Sunnyvale, CA 94089, Tel: 408-745-6400; Empl.: 12 ..... **D•1103-1105**

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IL Arlington Heights, Coombs Assoc., Inc. 312-439-9810
NJ Fords, Marlin Data 201-738-7200

OMNI SWITCH USA, INC., 21630 N. 19th Ave., Ste. B-16, Phoenix, AZ 85027, Tel: 602-582-0629, FAX: 602-582-0665; Empl.: 100; *Sls. Mgr.:* Peggy Ann Wenzel, V.P.

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FL Fort Lauderdale, Dyne -A- Mark 305-771-6501
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GA Atlanta, Omron Elctrns., Inc. 404-477-2115
IL Hoffman Estates, Omron Elctrns., Inc. 312-843-2780
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IN Southbend, Valentine & Assoc. 219-288-7070
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NY Rochester, Omron Elctrns. 716-342-0953

NY Oceanside, Bitten Assocs. 516-678-6222
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OH Columbus, Omron Elctrns. 614-847-8209
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Can MOntreal, Ormon Canada, Inc. 514-694-6361
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KY Pewee Valley, R.O. Whitesell & Assoc. 502-241-1441
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MI Grand Rapids, R.O. Whitesell & Assoc. 616-942-5420
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CA Los Angeles, Bell Inds. 213-826-6778
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CA Tustin, AVED 714-259-8258
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IL Palatine, Ohm Elctrns. 312-359-5500
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MI Grand Rapids, RM Elctrns. 616-531-9300
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CT	Clinton, Selmark Associates	203-573-9088
FL	Oviedo, Conley & Assocs., Inc.	305-365-3283
GA	Roswell, AWREP Associates, Inc.	404-998-5008
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MD	Randallstown, Beacon North	703-478-2480
MA	Millis, Selmark Assocs., Inc.	508-376-2914
MI	St. Clair Shores, DEM Electronic Sales	313-777-1750
MN	Minneapolis, Holmgren	612-786-7641
MO	Ferguson, BC Elctrn. Sls.	314-521-6683
NH	Hopkinton, Selmark Associates, Inc.	508-376-2914
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OH	Dayton, C. A. Robinson Co.	513-278-7969
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CO	Denver, Aki Entprs.	303-388-4488
CO	Denver, AKI Entprs.	303-388-4488
GA	Atlanta, Satori Elec.	404-320-8482
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ORBIT INSTRUMENT OF CAL., 6431 Global Dr., Cypress, CA 90630, Tel: 714-527-0561, TWX: 510-221-2122; FSC No.: 11263; *Sls. Mgr.:* Graham Vernon ..... **B•1881; D•1155**

Local Sales Offices & Reps

CA	San Diego, D. Cary	619-222-8839
MA	Tewksbury, Delcon Sls.	617-851-9911

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Systems Corporation

FAX: 503-640-6491

ORCAD SYSTEMS CORP., 1049 S.W. Baseline, Ste. 500, Hillsboro, OR 97123, Tel: 503-640-9488, TELEX: 62899424, ESYLNK: 9102402090 ORCAD UQ; Empl.: 30; *Sls. Mgr.:* Peter LoCascio; *Dist. Mgr.:* Peter LoCascio ..... **D•1133**

Local Sales Offices & Reps

AZ	Scottsdale, Tusar	602-998-3688
CA	Garden Grove, Advanced Digital Grp.	714-897-0319
CA	Santa Clara, Elcor Assocs.	408-980-8868
FL	Odessa, High Tech Support Grp.	813-920-7564
GA	Duluth, Electro-Cadd	404-446-7523
KS	Overland Park, Walker Engrg., Inc.	913-888-0089
MA	Wilmington, DGA Assocs., Inc.	617-935-3001
MI	Bloomfield Hills, MacKellar Assocs.	313-335-4440
MN	Minneapolis, Cornstrand, Inc.	612-788-9234
NJ	Manalapan, Beta Lambda, Inc.	201-446-1100
NC	Raleigh, Tingen Techn. Sls., Inc.	919-870-6670
OH	Cincinnati, Frank J. Campisano, Co.	513-574-7111
OR	Beaverton, Integrated Automation	503-645-6628
TX	Houston, Abcor, Inc.	713-486-9251
WA	Bellevue, Seltech	206-746-7970
Can	Markham, Ont., Electralert, Ltd.	416-475-6730
Can	Vancouver, BC, Interworld Elctrns., Ltd.	604-984-4171

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CA	Garden Grove, Advanced Digital Grp.	714-897-0319
CA	Santa Clara, Elcor Assocs.	408-980-8868
FL	Odessa, High Tech Support Grp.	813-920-7564
GA	Duluth, Electro-Cadd	404-446-7523
KS	Overland Park, Walker Engrg., Inc.	913-888-0089
MA	Wilmington, DGA Assocs., Inc.	617-935-3001
MI	Bloomfield Hills, MacKellar Assocs.	313-335-4440
MN	Minneapolis, Cornstrand, Inc.	612-788-9234
NJ	Manalapan, Beta Lambda, Inc.	201-446-1100
NC	Raleigh, Tingen Techn. Sls., Inc.	919-870-6670
OH	Cincinnati, Frank J. Campisano, Co.	513-574-7111
OR	Beaverton, Integrated Automation	503-645-6628
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Can	Markham, Ont., Electralert, Ltd.	416-475-6730
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ORCUS, Box 16022, Kansas City, MO 64112, Tel: 913-897-5128, TELEX: 4994037, FAX: 913-897-5468; *Sls. Mgr.:* Manford Eaton

OREGON MICRO SYSTEMS, INC., 1800 N.W. 169th Pl, A400, Beaverton, OR 97006, Tel: 503-644-4999, FAX: 503-629-0688; Empl.: 7; *Sls. Mgr.:* Wayne Hunter

ORIEL CORP., 250 Long Beach Blvd., Stratford, CT 06497-0872, Tel: 203-377-8282, TWX: 710-453-8719; Empl.: 149; *Sls. Mgr.:* Thom. Connolly

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CA Santa Clara, Oriental Motor U.S.A. Corp. 408-988-2655
IL Rolling Meadows, Oriental Motor U.S.A. Corp. 312-577-0310
NJ Fairfield, Oriental Motor U.S.A. Corp. .. 201-882-0480

ORIGINAL ELECTRIC MFG. CO., INC., 123 Lincoln Blvd., Middlesex, NJ 08846, Tel: 201-271-5770, FAX: 201-271-5774

ORION INSTRUMENTS

ORION INSTRUMENTS, INC., 702 Marshall St., Redwood City, CA 94063, Tel: 415-361-8883, TELEX: 530942; *Sls. Mgr.:* Bob Reynolds ..... **D•1332-1333, 1436**

ORMEC SYSTEMS CORP., 19 Linden Park, Rochester, NY 14625, Tel: 716-385-3520, TELEX: 510-601-5941; Empl.: 50; *Sls. Mgr.:* Richard Morgan

ORTEL CORP., 2015 W. Chestnut St., Alhambra, CA 91803, Tel: 818-281-3636, TELEX: 752434, FAX: 818-281-8231; *Sls. Mgr.:* Bill Moore

OSBORNE TRANSFORMER, 19636 Derby St., Detroit, MI 48203, Tel: 313-368-4136, FAX: 313-368-5558; Empl.: 20; *Sls. Mgr.:* J. R. Osborne

OSCILLATEK, K & L Microwave, 620 North Lindenwood Dr., Olathe, KS 66062, Tel: 913-829-1777, TELEX: 437045, FAX: 913-829-3505; FSC No.: 57693; Empl.: 64; *Sls. Mgr.:* Bob Goodwin ..... **A•1458-1461**

Local Sales Offices & Reps

AL Huntsville, Beacon Elctrns. 205-881-5031
AZ Scottsdale, Thorson Desert States 602-998-2444
CA Carlsbad, Martronix 619-729-2656
CA El Toro, Martronix 714-858-0632
CA Newbury Pk., Martronix 805-499-6385
CA Palo Alto, Horne Electro Sls. 415-494-6777
CO Aurora, Thorson Desert States 303-671-7344
FL Boca Raton, Beacon Elctrns. 305-997-4518
FL Clearwater, Beacon Elctrns. 813-796-2378
FL Longwood, Beacon Elctrns. 305-332-1940
GA Atlanta, Beacon Elctrns. 404-256-9640
IL Barrington, R-Tek 312-382-4600
IN Ft. Wayne, R-Tek 219-432-8783
IA Cedar Rapids, Midwest Tech. Sls. 319-365-4011
KS Gooddard, Midwest Tech. Sls. 316-794-8565
KS Lenexa, Midwest Tech. Sls. 913-888-5100
MD Burtonsville, Eastern Instrmn. 301-384-8500
MA Needham, Addelco Corp. 617-444-4754
NM Albuquerque, Thorson Desert States 505-293-8555
NY Fairport, bbd Elctrns., Inc. 716-425-1112
NY Huntington, C. R. Mayer Co. Inc. 516-692-4221
NC Raleigh, Beacon Elctrns. 919-787-0330
OH Miamisburg (Dayton), Elctrn. Comps. Inc. 513-866-3340
OR Beaverton, Thorson Co. Northwest ... 503-644-5900
PA Southampton, Eastern Instrmn. of PA 215-355-7700
TX Dallas, McDonald Assocs. 214-239-7236
WA Bellevue, Thorson Co. Northwest 206-455-9180

OSCILLOQUARTZ, B & J Marketing, 17074 Dearborn St., Northridge, CA 91325, Tel: 818-993-0048, TELEX: 650 2068183, FAX: 818-993-5758; Empl.: 125; *Sls. Mgr.:* Alain Jendly

Local Sales Offices & Reps

CA Campbell, SMA Associates 408-370-6900
CA Tustin, Tauber-Dreyer Corp. 714-838-9846
Can Ottawa, A.I.M. Electronics 613-722-8286

OSHINO ELECTRIC LAMP WORKS, LTD., 5-2, Minami-Shinagawa 2-chome, Shinagawa-Ku, Tokyo, Japan, Tel: 03-471-8548, TELEX: 0242-2117, FAX: 03-450-3939; Empl.: 300; *Sls. Mgr.:* T. Koyama ..... **B•1176-1177**

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Local Sales Offices & Reps

AZ Scottsdale, BSE 602-483-0383
CA Brea, MASCO Elctrns., Inc. 714-529-0866
CA Cupertino, West-Comp., Inc. 408-245-3100
CO Englewood, CompuTech Mktg. 303-773-3981
CT Glastonbury, Pace Assocs. 203-659-2266
FL Deerfield Beach, Newelt Hynes 305-429-3207
GA Lawrenceville, R.L. Panyik & Assoc. ... 404-923-3703
IL Wheaton, Chadra-Schilke Assoc. 312-653-8126
IA Anamosa, WG Controls 319-462-3456
MD Silver Spring, L. G. White & Co. 301-434-1555
MI Troy, C. B. Jensen 313-643-0506
MN Minneapolis, Jos-Co/Melius, Inc. 612-861-3343
MO Creve Coeur, Hill & Co. 314-432-1136
NJ Caldwell, Grimm, Siegal Assocs., Inc. 201-575-9300
NY Syracuse, Canavan-Scanlon Assocs., Inc. 315-437-1271
OH Cincinnati, O. H. Bromberg & Assocs. 513-771-9333
OH Cleveland, KT/DEPCO 216-442-6200
OH Highland Hieghts, Major Electronix 216-461-2100
PA Edgemont, White/Whiddett Co. 215-353-6343
TX Dallas, Glidden Electro Equip. 214-341-0610
WA Bellevue, MC Assocs. 206-746-7780
Can Scarborough, Ont., Banke Elctrns. 416-477-7722

Local Distributors

AZ Tempe, LComp., Inc. 602-730-1633
CA Anaheim, Deco Elctrns., Inc. 714-630-8252
CA Gardena, California Switch & Signal 1-800-421-2471
CA Los Angeles, Master Distrs. 213-452-1229
CA Redwood City, HdB 415-368-1388
CA San Diego, Deco Elctrns., Inc. 619-693-1595
CA San Jose, Spectra Elctrns. 408-452-1590
CA Tustin, Western Switches & Controls, Inc. 714-259-8144
CA Van Nuys, Wes Garde Components .. 213-873-4802
CO Aurora, Jet Elctrn. Supp., Co., Inc. 303-364-1000
CT Fair Haven, Control Comps. 203-865-0300
CT Waterbury, Century Elec. Supps., Inc. 203-755-0405
CT West Hartford, Wes Garde Components 203-527-7705
FL Lakeland, A A Elec. 800-237-8274
FL Lakeland, Wes Garde Components ... 813-644-7564
IL Addison, LComp., Inc. 312-628-1400
IL Carol Stream, Wes Garde Components 1-800-323-9431
IL Crystal Lake, Sub Sem 815-459-4139
IN Indianapolis, Mar Elctrns., Inc. 317-633-6699
KS Overland Park, Wes-Garde 913-262-2718
KS Wichita, LComp.,Inc. 316-265-5100
MD Kensington, Marine Air Supp. 301-949-9560
MA Canton, Impact Sls. Co., Inc. 617-821-1500
MA Marlboro, Hardware Specialties 508-481-8622
MI St. Clair Shores, SPEMCO, Inc. 313-771-2700
MN Minneapolis, Dot Elctrns. 612-861-4561
MN Minneapolis, Elctrn. Center, Inc. 612-371-5200
MO Maryland Hgts., LCOMP, Inc. 800-325-1393
MO St. Louis, Wes-Garde Comps. 314-567-7776
NJ Mt. Laurel, Wes Garde Components .. 609-778-8190
NJ Oakland, Relay Specialties, Inc. 201-337-1000
NY Bohemia, Key Comps. 516-567-7500
NY Buffalo, Summit Dist. 716-887-2800
NY Johnson City, Help Elctrns. 607-729-3528
NY Woodside, Switches Unltd., Inc. 718-478-5000
OH Shandon, Cartessa Corp. 513-738-4477
OH Westerville, Wes Garde Components 614-885-0319
TX Dallas, GEECO Sls. Co. 214-341-0610
TX Dallas, Wes Garde Components 214-357-1768
WI Grafton, Lakeview Elctrns. 414-377-8250
WI Mequon, Taylor Elec. 414-241-4321
Can Downsview, Ont., Westburne Elctrns. 416-635-2950

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OTTO CONTROLS, Otto Engineering, 2 E. Main St., Carpentersville, IL 60110, Tel: 312-428-7171, TELEX: 722426; FSC No.: 21649; Empl.: 200; *Sls. Mgr.:* R. E. Sparks ..... **B•1828-1829**

Local Sales Offices & Reps

AL Birmingham, Electro Sls. 205-681-4680
AZ Scottsdale, Advent Comps. Corp. 602-481-0044
CA Anaheim, Gabriel & Assocs. 714-666-0660
CA Cupertino, West Comp Inc. 408-245-3100
FL Deerfield Beach, Newell Hynes Assocs., Inc. 305-429-3207
GA Atlanta, Electro Sls., Inc. 404-394-1122
IL Downers Grove, Rockford Controls Co. 312-960-2046
IN Indianapolis, Rockford Controls Co. ... 317-248-2518
MD Gaithersburg, Naudain Assocs. Southern, Inc. 301-258-5040
MA Needhan Heights, Newscott 617-444-1923
MI Madison Heights, Pine Sls., Inc. 313-589-0350
MO Kansas City, Harris-Hanson Co. 816-763-6200
MO St. Louis, Harris-Hanson Co. 314-432-3611
NJ Marlton, Naudain Assocs., Inc. 609-983-5300
NY Great Neck, Tylinski Co. 516-466-9070
NC Kernersville, CCI South, Inc. 919-996-4814
OH Kettering, Electro-Com 513-299-0864
TN Chattanooga, Electro Sls. 615-267-4260
TX Dallas, Control Comps. Corp. 214-458-8677
WA Bellevue, James Findlay Co. 206-455-9597

Local Distributors

CA Gardena, Cal Switch 213-770-2330
CA Los Angeles, Electric Switches, Inc. ... 213-660-1310
MD Kensington, Marine Air Supp. 301-949-9560
MA Hingham, Sager Elec. Supp. 617-749-6700
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..... **A•1462-1463, 2026-2027**

Local Sales Offices & Reps

AL	Huntsville, L & D, Inc.	205-837-1469
CA	EL toro, Marktronix	714-858-0632
CA	Los Angeles, Martronix	213-782-7826
CA	San Mateo, Melvin Sls.	415-349-7445
DC	Towson, Dickison Sales Co.	301-823-0923
FL	Longwood, D. Assocs.	407-830-8976
FL	Maitland, Ellis & Assocs.	407-645-11-1
GA	Atlanta, L & D Inc.	404-395-7079
KS	Lexena, MIDTEC Associates	913-541-0505
MD	Towson, Dickison Sls. Co.	301-823-0923
MA	Milton, Naton Assocs.	617-698-0670
NJ	Paramus, Eltech Sls.	201-967-1309
NY	Buffalo, Quality Comps.	716-837-5430
NC	Greensboro, L & D, Inc.	919-292-3201
NC	Raleigh, L&D Inc.	919-876-5301
TN	Bristol, L&D Inc.	615-878-2266
TX	Euless, W. Pat Fralia Co.	817-354-1144
WA	Seattle, Interconnect Tech.	206-462-9508
Can	Mississauga, Vitel Electronics	416-676-9720

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OXLEY, INC., 25 Business Pk. Dr., P.O. Box 814, Branford, CT 06405, Tel: 203-488-1033, TWX: 910-350-6660, FAX: 203-481-6971; FSC No.: 3R006; *Sls. Mgr.:* Carol Carr
..... **A•1715; B•1025, 1179; C•1465**

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CA	Fullerton, GRU Assocs.	714-738-0905
CA	Irvine, Balzer Wolfe Assocs.	714-261-6877
CA	San Jose, J. T. McFarland Assocs.	408-286-9333
FL	Longwood, Krebs Myton	305-788-9333
IL	Lincolnwood, Electro-Tech Mktg. Assocs.	312-676-3151
MA	Needham, Pay Parron Co., Inc.	1-800-225-4280
MN	St. Paul, Bonament Heyda Co.	612-484-8531
PA	Paoli, Stitzer Assocs.	215-644-5500
TX	Richardson, Eagle Marketing	214-238-5383

OYSTER TERMINALS, 1640 5th St., Suite 224, Santa Monica, CA 90401, Tel: 213-395-4774, TELEX: 65-2337 (BT Smedley SNM); *Sls. Mgr.:* Eric Sheppard; *Dist. Mgr.:* Christopher E. Thomson

PACCOM, 3928 148th NE, Redmond, WA 98052, Tel: 206-883-9200, 800-426-6254, TWX: 910-449-2973, FAX: 206-881-0508; Empl.: 16; *Sls. Mgr.:* B. Rudd

PACE INC., 9893 Brewers Ct., Laurel, MD 20707, Tel: 301-490-9860, TELEX: 198296, FAX: 301-498-3252; *Sls. Mgr.:* James K. Bausell

PACER INDUSTRIES, INC., 1450 First Ave., Chippewa Falls, WI 54729, Tel: 715-723-1141, TELEX: 284755, FAX: 715-723-7890; FSC No.: 60162; *Sls. Mgr.:* Patrick Brennan

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PACIFIC COAST CIRCUITS, INC., 189 Granada Dr., San Luis Obispo, CA 93401, Tel: 805-544-4881, FAX: 805-544-6475; FSC No.: 66107; Empl.: 18; *Sls. Mgr.:* Chris Cofer

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PACIFIC COMMUNICATIONS, 2041 S. Grand Ave., Santa Ana, CA 92705, Tel: 714-546-0147; Empl.: 60

PACIFIC ELECTRICORD, 747 W. Redondo Bch. Blvd., Gardena, CA 90247, Tel: 213-532-6600, TWX: 910-346-7619, FAX: 213-538-9479; Empl.: 850; *Sls. Mgr.:* Robert Huffman; *Dist. Mgr.:* Robert Huffman

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PACIFIC INSTRUMENTS INC., 215 Mason Circle, Concord, CA 94520, Tel: 415-827-9010, FAX: 415-827-9023; Empl.: 60; *Sls. Mgr.:* Don Seyk

PACIFIC MAGNETICS CORP., 2602 Transportation Ave., Ste. G, National City, CA 92050, Tel: 619-474-8216, FAX: 619-474-3979; *Sls. Mgr.:* Mary Hill

PACIFIC MICROCOMPUTERS, Signal Technology, 6730 Mesa Ridge Rd., San Diego, CA 92121, Tel: 619-453-8649, TELEX: 701-578; FSC No.: 701-578;;;408-433-1337; Empl.: 30; *Sls. Mgr.:* Walter Snell

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..... **D•2218-2223**

Local Sales Offices & Reps

AZ	Phoenix, Barnhill Assocs.	602-788-9596
CA	San Jose, Amasco Corp.	408-262-1500
CA	Torrance, Amasco Corp.	213-781-9494
CO	Englewood, Barnhill Assocs.	303-741-3844
CO	Grand Junction, Barnhill Assocs.	303-241-0039
FL	Ft. Lauderdale, W. A. Brown Instrs.	305-776-4055
FL	Melbourne, W.A. Instrs.	407-723-0766
FL	Orlando, W.A. Brown Instrs.	407-648-9660
GA	Norcross, W.A. Brown Instrs.	404-449-7160
IL	Arlington Hgts., Comtel Midwest	312-392-4040
IN	Indianapolis, Comtel Midwest	317-253-1681
KS	Shawnee Mission, Comtel Midwest Co.	913-268-0762
MA	Burlington, Intersell, Inc.	617-273-3844
MI	Plymouth, EQS Sys.	313-455-7924
MN	Minneapolis, Loren Green Assocs.	612-571-6666
MO	St. Louis, Comtel Midwest Co.	314-991-5363
NM	Albuquerque, Barnhill Assocs.	505-299-7658
NY	Liverpool, Northern Tech. Sls. Assocs., Inc.	315-451-1091
NY	Wantagh, Bytec Reps.	516-781-7400
NC	Cary, W.A. Brown Instrs.	919-460-1120
OH	Chesterland, EQS Sys.	216-729-2222
OH	Dayton, EQS Sys.	513-236-7676
OK	Tulsa, J. Wisdom & Assocs.	918-665-8899
NJ	Cherry Hill, Sci. Reps.,Inc.	609-662-5222
PA	Pittsburgh, EQS Sys.	412-261-2604
TX	Richardson, J. Wisdom & Assocs.	214-470-9093
TX	Round Rock, J. Wisdom & Assocs.	512-255-1167
UT	Orem, Barnhill Assocs.	801-226-1239
VA	Fairfax, Scientific Assocs.	703-385-0600
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WA	Vancouver, Al Smith Co.	206-892-9912
WI	New Berlin, Comtel Midwest Co.	414-544-6042
Can	Markham, Ont., Multitest Elctrns.	416-470-2929
Can	St. Laurent, PQ, Multitest Elctrns.	514-337-0723

Local Distributors

EXP	Oxnard, CA, Trans World Trade	805-486-1818

PACIFIC RESISTOR CO., 18300 Oxnard St., Tarzana, CA 91356, Tel: 818-345-7811, TELEX: 06416; FSC No.: 06416; *Sls. Mgr.:* Douglas Trewhitt ..... **A•2028-2029**

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PACIFIC SCIENTIFIC, Electro Kinetics Division, 402 E. Gutierrez St., Santa Barbara, CA 93101, Tel: 805-963-2055, TWX: 910-334-1177; Empl.: 210; *Sls. Mgr.:* Robert E. Lynch

PACIFIC TRANSDUCER CORP., 2301 Federal, Los Angeles, CA 90064, Tel: 213-478-1134, TELEX: 3781834 PTC, FAX: 213-312-0826; Empl.: 22; *Sls. Mgr.:* Thomas Lopez

PACTEC, LaFrance Corp., Enterprise & Executive Avenues, Philadelphia, PA 19153, Tel: 215-365-8400, TELEX: 506-082, FAX: 215-365-4420; Empl.: 503; *Sls. Mgr.:* J. Craig; *Dist. Mgr.:* T. DiSciascio
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AL	Huntsville, Scott Ray	205-883-2159
CA	Anaheim, Jonathan Winters	714-779-8092
CA	San Jose, Jeff A. Singer	408-943-1609
MO	St. Louis, Spectrum Sls.	314-731-5151
TX	Dallas, Tesco	214-553-1200
FL	Palm Harbor, Roger Hauck	813-784-7895
FL	Plantation, Kathy Hughes, Inc.	305-472-5323
IL	Lombard, Parke Van Brott	312-916-9377
KS	Overland Pk., Spectrum Sls.	913-648-6811
TX	Austin, Tesco	512-834-8374
MA	Woburn, Suzanne Erkert	617-933-1335
EXP	Philadelphia, PA, PacTec Export Sls. Dept.	215-365-8400
NJ	Merchantville, Bill Boucot	609-488-9086
NC	Thomasville, Keith Pierce	919-472-2030
OH	Perrysburg, Bruce Brown	419-874-1110
WA	Seattle, Mike Werttemberger	206-363-9899
WI	Appleton, Ed Sabish	414-731-7212

Local Distributors

AL	Birmingham, American Elctrns. Supp.	205-942-4656
AZ	Phoenix, Tri-Tek	602-371-0860
AZ	Tempe, Circut Specialists, Inc.	602-966-0764
AZ	Tucson, Anatech Corp.	602-881-2348
CA	Anaheim, A-Z Elctrns.	714-634-3620
CA	Anaheim, R&D Elctrns.	714-773-0240
CA	Burbank, Electronic City	213-842-5275
CA	Canoga Park, Sandy's Elctrns. Supp.	213-346-8353
CA	Carpenteria, Electronic Resources	805-684-5439
CA	Costa Mesa, Marvac	714-540-3280
CA	Cucamonga, Abletronics	714-987-7606
CA	El Segundo, Force Elctrns.	213-772-1324
CA	El Toro, R-Vac	714-586-1210
CA	Gardena, California Switch & Signal	213-538-9830
CA	Milpitas, Zack Elctrns.	408-942-5132
CA	Monterey, Zackit (Monterey)	408-375-3144
NJ	Pennsauken, Jan Ind'l Elctrns.	609-663-4800
CA	Sacramento, Zackit/Sacramento	916-446-3131
CA	San Diego, Southland Comps.	619-578-6630
CA	San Francisco, Zack Elctrns.	415-626-1444
CA	San Jose, Force Elctrns.	408-435-1324
CA	San Jose, Rose Elctrns.	408-943-0200
CA	Sunnyvale, Fry's Elctrns.	408-733-1770
FL	Tampa, Dow Elctrns., Inc.	813-870-3315
CA	Thousand Oaks, Sandy's Elctrns.	818-889-1209
CA	Vallejo, Zackit (Vallejo)	707-644-6676
CO	Aurora, Jet Elctrn. Supp.	303-364-1000
CO	Englewood, Indelco	303-694-9444
CT	Stratford, Utronics	203-378-4201
CT	Wallingford, Midstate Elctrns.	203-265-9900
CT	Wallingford, Sager Elctrl. Supp.	203-265-4600
DE	Wilmington, Wholesale Elctrns. Inc.	302-656-9988
FL	Largo, Electronic Precepts of FL	813-544-3636
FL	Longwood, Intertec Comps.	305-834-7777
FL	St. Petersburg, Knapp of Florida	813-392-0406
FL	Tampa, Dow Elctrns., Inc.	813-870-3315
FL	Tampa, Sunex Elctrns.	813-885-4074
FL	West Palm Beach, Nurmi Elctrns.	305-686-8553
GA	Atlanta, Ack Radio	404-351-6340
GA	Norcross, Dow Elctrns.	404-448-4004
GA	Norcross, Dow Elctrns., Inc.	404-448-4004
GA	Norcross, EMSCO	404-925-8366
HI	Honolulu, Precision Radio, Ltd.	808-537-5291
IL	Berwyn, BB & W Inc.	312-242-1533
IL	Champaign, Klaus Radio	217-356-1896
IL	Chicago, Newark Elctrns.	312-784-5100
IL	Elk Grove, Martec Assocs.	312-956-8090
IL	Mt. Prospect, Tri State Elctrns.	312-255-0600

IL Northbrook, Classic Comps. 312-291-0019
IL Peoria, Klaus Radio 309-691-4840
IL Rosemont, Advent Elctrns. 312-298-4210
IL Villa Pk., Melvin Elctrns. 312-279-5015
IN Indianapolis, Advent Elctrns. 317-872-4910
IA Cedar Rapids, Iowa Radio Supply 319-393-4510
KS Salina, Electronics, Inc. 913-827-7377
KY Bowling Green, Randolph, Hale & Meredith 502-781-1460
KY Louisville, Peerless Elctrns. 502-637-7674
MD Beltsville, Mark Elctrns. 301-595-5040
MD Beltsville, P.S.I. 301-937-4960
MD Jessup, Almo Elctrns. 301-792-9197
MD Jessup, Almo Elctrns. (MD) 301-792-9197
MA Hingham, Sager Elec. Supp. 617-749-6700
MA Westborough, In-Stock Products Co. .. 617-870-5750
MI Grand Rapids, S. F. Elctrns. 616-459-0216
MI Livonia, RS Elctrns. 313-525-1155
MI Taylor, Tel Van Elctrn. Supp. 313-291-3515
MN Minneapolis, AEI Elctrn. Parts 612-338-4754
MN Minneapolis, Berquist 612-835-2322
MN New Brighton, Parts I 612-633-8079
MO Kansas City, Walters Indl. Elctrns. 816-531-7015
MO St. Louis, Franklin Elctrns. 314-993-5333
NE Lincoln, Scott Elctrns. 402-466-8221
NH Salem, Sager Elctrl. Supp. 603-898-1348
NJ Frenchtown, Suntec/Aries 201-996-4093
NJ Pennsauken, Jan Indl. Elctrns. 609-663-4800
NJ Pine Brook, Parts Masters 201-227-7797
NJ Rockaway, Tonar Inds., Inc. 201-586-9000
NM Albuquerque, B B & W 505-344-3311
NM Albuquerque, Walker Elctrns. Supp. ... 505-883-2992
NY Buffalo, Summit Distr. 716-887-2800
NY Farmingdale, Midway Indl. Electro 516-293-6800
NY Farmingdale, Pride Elctrns. 516-293-4020
NY Freeport, KRP Elctrns. 516-623-3346
NY Hauppauge, Sager Elctrns. 516-348-1300
NY Mamoroneck, Logicomp Elctrns., Inc. .. 914-698-9332
NY Rochester, Masline Elctrns., Inc. 716-546-5373
NY Rochester, Summit Distr. 716-334-8110
NC Burlington, Womack Elctrns. 919-227-7486
NC Greensboro, Hammond Elctrns. 919-275-6391
NC Raleigh, Sager Svc. Plus Elctrns. 919-850-9550
NC Raleigh, Southeastern Elctrns. 919-828-2311
OH Cincinnati, Hughes-Peters 513-351-2000
OH Cincinnati, R. S. Elctrns. 513-793-2450
OH Cleveland, Roberts Elctrns. 216-238-1711
OH Columbus, Hughes-Peters 614-294-5351
OK Oklahoma City, She Elctrns. 405-843-5941
OK Tulsa, Radio Inc. 918-587-9123
OR Beaverton, Norvac Elctrns. 503-644-1025
OR Beaverton, Rose Elctrns 503-629-9288
OR Portland, Radar Elec. 503-232-3404
PA Allentown, P. A. Peters 215-434-5237
PA Exton, VSH Elctrns. 215-363-2250
PA Marcus Hook, Lindwood Wholesale, Inc. 215-485-0777
PA Philadelphia, Almo Grp. 215-698-4000
PA York, Rosen Elctrns. 717-843-7881
TN Chattanooga, Horizon Elctrns. 615-266-4729
TN Chattanooga, Techni-Tronics 615-842-0514
TN Columbia, Randolph & Williams, Inc. .. 615-388-7566
TN Memphis, Bluff City 901-345-9500
TN Nashville, Bluff City 615-242-8000
TN Nashville, Randolph & Rice 615-255-5602
TX Austin, Galtronics 512-837-7470
TX Austin, Wofford Elctrns. 512-339-1131
TX Dallas, Force Elctrns. 214-247-9955
TX Dallas, Off-the-Shelf Comps. 214-247-0052
TX Dallas, Wholesale Elctrns. Supp. 214-824-3001
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Houston, Ace Elctrns. 713-688-8114
TX Houston, Force Elctrns. 713-561-8644
TX Houston, Wofford Elctrns. 713-847-3583
TX Richardson, Off-the-Shelf Comps. 214-238-0808
TX San Antonio, Altex Elctrns. 512-828-0503
UT Salt Lake City, Standard Supp. 801-486-3371
VA Charlottesville, Virginia Elctrn. Comps. 804-296-4184
WA Bellevue, Almac Elctrns. DKM Co. 206-643-9992
WA Seattle, Radar Elec. 206-282-2511
WI Milwaukee, Industrial Elctrns., Inc. 414-276-1212
WI Milwaukee, Marsh Elctrns. 414-475-6000
WI New Berlin, Classic Comps. Supp., Inc. 414-786-5300
WI Oshkosh, Electronic Inds., Inc. 414-235-8930
Can Burnaby, BC, Intek Elctrns. 604-294-8100
Can Mississauga, Ont., Rush Elctrns. 416-677-7280
Can Pointe Claire, Que., Future Elctrns. 514-694-7710
Can Vancouver, BC, Future Elctrns. 604-294-1206
Can Victoria, BC, Queale Elctrns., Ltd. 604-388-6111

PAINE CORPORATION, 2401 S. Bayview St., Seattle, WA 98144, Tel: 206-329-8600, 800-426-0366, ESYLNK: 6294-5057, FAX: 206-329-1615; FSC No.: 13624; Empl.: 93; *Sls. Mgr.:* R. E. Helmick

PAKTRON, See ITW Paktron

PAK-TRONIC, See Tracor Paktronics

PALADIN CORP., 3543 Old Conejo Rd., Ste. 102, Newbury Park, CA 91320, Tel: 805-499-0318, FAX: 805-499-4006; Empl.: 20; *Sls. Mgr.:* Dennis Behling

PALOMAR ENGINEERS, Box 455, Escondido, CA 92025, Tel: 619-747-3343; Empl.: 9

PAMRAN INC., 1900 Williams St., Young Ind. Pk., Racine, WI 53404, Tel: 414-637-7999; Empl.: 28; *Sls. Mgr.:* R. C. Pfeil

PANAMETRICS, 221 Cresent St., Waltham, MA 02254, Tel: 617-899-2740, TELEX: 6817337, TWX: 951006, FAX: 617-899-1552; Empl.: 200; *Sls. Mgr.:* Bob Mel

Panasonic

FAX: 201-392-4782

PANASONIC INDUSTRIAL CO., Battery Sls. Div., Box 1511, Secaucus, NJ 07096-1511, Tel: 201-348-5266; Empl.: 25 ..... **D•1502-1509**

Local Sales Offices & Reps

AZ Scottsdale, Dar-C 602-948-2240
CA Glendale, Halbar Assocs. Inc. 818-246-8263
CA Pleasanton, Moulthrop Sls. Inc. 415-463-0450
CA San Diego, Tauber & Assocs. 619-274-7242
FL Deerfield Bch., S.E.C. 305-426-4601
IN Indianapolis, Marketing Engs. Inc. 317-872-5665
KS Overland Pk., Spectrum Sls. 913-648-6811
MA Burlington, Conti-Younger Assocs. Inc. 617-273-1582
MN Eden Prairie, Electro Mark Inc. 612-944-5850
OH Beachwood, Elctrn. Salesmasters Inc. 216-831-9555
OR Beaverton, Advanced Power Prods. ... 503-646-0994

Local Distributors

AL Huntsville, Resistacap Inc. 205-883-4270
AZ Scottsdale, Electro Mktg. 602-991-0110
CA San Diego, Tauber Elctrns. Inc. 619-274-7242
CA San Jose, Rose Elec. Distrbg. Co. 408-263-2934
CA Santa Clara, Cypress Elctrns. Inc. 408-980-2500
CA Van Nuys, NESCO 818-781-0505
CO Englewood, Indelco/AVT 303-694-9444
CT Woodbury, Cell Technlg. 203-266-4105
FL Miami, Electronic Equip. Co. 305-526-6000
FL St. Petersburg, Micro Precision 813-821-5504
GA Norcross, Applied Power, Inc. 404-263-0421
IL Morton Grove, Power Pak Inc. 312-966-6000
IL Palatine, Ohm Elctrns. 312-359-5500
IN Indianapolis, Bell Inds. 317-634-8202
MD Aberdeen, Harco Elctrns. 301-575-6885
MD Beltsville, Mark Elctrns. 301-792-0072
MA Canton, Impact Sls. Co. Inc. 617-821-1500
MA Danvers, Generation Elctrns. Inc. 617-777-4866
MI Brighton, Applied Power Inc. 313-227-3604
MN Thief River Falls, Digi-Key 800-346-5144
MO St. Louis, Indl. Battery Prod. Inc. 314-423-7005
NJ Camden, Gen. Radio 609-964-8560
NJ Clifton, Engineered Assem. 201-340-0600
NC Raleigh, Engrd. Assemblies Inc. 919-790-9700
NC Winston Salem, Kirkman Elctrns. 800-334-0158
OH Columbus, Elctrn. Mktg. Corp., Promark Div. 614-876-8885
OH Columbus, Hughes-Peters 614-294-5351
OR Beaverton, Micro Power 503-626-7086
PA Bensalem, Avex Elctrns. Corp. 800-345-1295
TX Dallas, Computer Comps. Corp. 214-239-0271
TX Dallas, Norvell Elctrns. Inc. 214-233-0020
TX Fort Worth, Allied Elctrns. 817-336-5401
WI Mequon, Taylor Elec. Co. 414-241-4321

Panasonic

FAX: 201-392-4441

PANASONIC INDUSTRIAL COMPANY, Electronic Components Division, 1 Panasonic Way, Secaucus, NJ 07094, Tel: 201-392-4290/4264; *Sls. Mgr.:* J. Ambrose/E. Budenieks/K. Sasaki; *Dist. Mgr.:* Dick Robert ..... **D•1107, 1936-1937**

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Local Sales Offices & Reps

AL Huntsville, Rep, Inc. 205-830-0470
AZ Phoenix, O'Donnell Assts. 602-944-9542
CA Los Alamitos, Power Specialists 213-594-9418
CA Pleasanton, Moulthrop Sls., Inc. 415-463-0450
CO Englewood, Comp. Sls., Inc. 303-779-8060
GA Tucker, Rep, Inc. 404-938-4358
IL Palatine, Technlg. Sls. 312-991-6600
IN Indianapolis, Mktg. Engrs., Inc. 317-872-5665
MI Brighton, Elctrn. Sources, Inc. 313-227-3598
MN Eden Prairie, Electro-Mark, Inc. 612-944-5850
MO St. Louis, KKB & Co. 314-647-2400
NJ Fair Lawn, March Inds. 201-794-0088
NJ Medford, Jack McCoy, Inc. 609-953-0770
NJ Secaucus, Panasonic 201-392-4290
NM Albuquerque, O'Donnell Assts. 505-883-1030
NY Mendon, Tech-Mark, Inc. 716-624-3840
NC Morrisville, Rep., Inc. 919-469-9997
NC Raleigh, Rep, Inc. 919-851-3007
OH Dayton, Del Steffan & Assocs. 513-293-3145
OH Lexington, Del Steffan & Assocs. 419-884-2313
OR Tigard, Elctrn. Engrg. Sls. 503-639-3978
PA Carnegie, Del Steffan & Assocs. 412-276-7366
PA Exton, Jack McCoy, Inc. 215-363-0350
TN Jefferson City, Rep., Inc. 615-475-4105
TX Dallas, Erickson Sls., Inc. 214-739-5833
UT Salt Lake City, Comp. Sls., Inc. 801-268-8440
WA Redmond, Elctrn. Engrg. Sls. 206-883-3374
Can Concord, Ont., Astec Comps., Ltd. 416-669-4022

Local Distributors

CA Buena Pk., Cypress Elctrns., Inc. 213-744-0355
CA Santa Clara, Cypress Elctrns., Inc. 408-980-2500
CT E. Haven, J.V. Elctrns. 203-469-2321
MI Livonia, RS Elctrns. 313-525-1155
MN Minneapolis, Indl. Comps., Inc. 612-831-2666
TX Dallas, Computer Comps. Corp. 214-239-0271
WI Milwaukee, Taylor Elec. Co. 414-241-4321

PANAVISE PRODS., 2850 E. 29th St., Long Beach, CA 90806, Tel: 213-595-7621, FAX: 213-595-9539; Empl.: 25; *Sls. Mgr.:* Gary Richter; *Dist. Mgr.:* Kathy DePorter

PANDUIT CORP., 17301 Ridgeland Ave., Tinley Park, IL 60477-0981, Tel: 800-777-3300, TELEX: 25-4560, FAX: 312-532-1811; FSC No.: ;06383; Empl.: 1200 ..... **C•1466-1468, 1908-1909**

Local Sales Offices & Reps

AL Birmingham, Frank Parker & Assocs. 205-655-4801
AL Mobile, Frank Parker & Assocs. 205-457-3896
AK Anchorage, Bar Elec. Agt. 907-345-7281
AZ Phoenix, Panduit Corp. 602-271-0167
AR Little Rock, Byron Carson Co. 501-663-6870
CA Anaheim, Panduit Corp. 714-978-2299
CA Los Altos, Ewing-Foley, Inc. 415-941-4525
CA Sacramento, Ewing-Foley, Inc. 916-885-6591
CA San Diego, Tak Sls. Co. 619-287-6141
CO Denver, Panduit Corp. 303-985-1900
CT Glastonbury, Panduit Corp. 203-657-4105
FL Ft. Lauderdale, Panduit Corp. 800-282-9209
FL Lakeland, Panduit Corp. 800-282-9209
FL Orlando, Panduit Corp. 800-282-9209
GA Atlanta, Panduit Corp. 404-256-5940
HI Honolulu, Pacific Power Prods. 808-836-0265
IL Burr Ridge, Panduit Corp. 312-887-1100
IN Indianapolis, Panduit Corp. 800-777-3300
KS Kansas City, Panduit Corp. 800-777-3300
KY Louisville, A. L. Pickens Co. 502-491-4215
LA Baton Rouge, Wells-Keown & Assocs. 504-292-6553
LA New Orleans, Wells- Keown & Assocs. 504-733-0301

MD Baltimore, Agency Group, Inc. 301-793-0023
MA N. Andover, Panduit Corp. 508-681-0451
MI Fraser, Panduit Corp. 313-791-1700
MI Grand Rapids, Panduit Corp. 800-777-3300
MN Minneapolis, Electric Comp. Sls. 612-933-2594
MO St. Louis, Panduit Corp. 314-894-7800
NE Omaha, Panduit Corp. 402-391-0452
NV Las Vegas, G & F Sls. Co. 702-367-0885
NJ Leonia, Panduit Corp. 201-461-7790
NM Albuquerque, F P Sls. 505-345-5553
NY Buffalo, Panduit Corp. 800-777-3300
NY Rochester, Panduit Corp. 800-777-3300
NY Schenectady, Panduit Corp. 800-777-3300
NY Syracuse, Panduit Corp. 800-777-3300
NC Raleigh, L. G. White Southern 919-872-6049
NC Winston-Salem, L. G. White Southern 919-725-3612
OH Cincinnati, Panduit Corp. 800-777-3300
OH Cleveland, Panduit Corp. 800-777-3300
OH Columbus, Panduit Corp. 614-888-6224
OK Oklahoma City, Elctrl. Prods. of Okla. 405-235-8041
OR Portland, Panduit Corp. 503-654-9455
PA Philadelphia, Kunz, Powell & Assoc. 215-296-9490
PA Pittsburgh, Cody Assocs., Inc. 412-787-5336
SC Greenville, L. G. White Southern 803-271-0630
TN Knoxville, Panduit Corp. 800-777-3300
TN Memphis, Byron Carson Co. 901-276-0614
TN Nashville, Panduit Corp. 800-777-3300
TX Dallas, Panduit Corp. 214-518-0004
TX Houston, Panduit Corp. 713-686-5600
UT Salt Lake City, Ray Walker Co. 801-973-7454
VA Richmond, L. G. White Southern 804-752-7055
WA Seattle, Panduit Corp. 800-777-3300
WV Parkersburg, Cody Assocs., Inc. 304-464-4302
WI Appleton, H. Mercer Co. 414-739-6223
WI Milwaukee, Panduit Corp. 800-777-3300
PR Santurce, L. Gandia & Assocs. 809-725-3473
Can Markham, Ont., Panduit Canada Ltd. 416-475-6922

PANEL COMPONENTS CORPORATION

FAX: 707-578-5478

PANEL COMPONENTS CORP., P.O. Box 6626M, Santa Rosa, CA 95406, Tel: 707-523-0600, TELEX: 176-747; Empl.: 18 ..... **B•1403; C•1470-1475, 1910-1914; D•2232**

Local Sales Offices & Reps

AL Huntsville, DHR Mktg. Inc. 205-722-0440
CA Santa Clara, Ross Mktg. Assoc. 408-988-8111
CA Tustin, Schoenbachler-Dobson Co. 714-544-1888
CO Englewood, Omega Ltd. 303-762-1921
FL Deerfield Beach, Newell-Hynes Assoc., Inc. 305-429-3207
GA Duluth, DHR Mktg., Inc. 404-564-0529
IL Northbrook, Raines & Assocs. 312-498-0890
IA Marion, M-S-B Assocs., Inc. 319-377-6261
KS Shawnee Mission, M-S-B Assocs., Inc. 913-432-2131
MA Scituate, Olsen Tech. Sls. 617-545-5101
MN St. Paul, Arkco Sls. 612-777-7454
MO St. Louis, M-S-B Assocs., Inc. 314-946-5577
NJ Mountain Lakes, Components For Elctrns. 201-334-2921
NY Victor, Net Sls. 716-924-1844
NC Raleigh, DHR Mktg., Inc. 919-829-1970
OH Cleveland, Rockford Controls 216-932-3848
OH Medina, Rockford Controls 216-725-3705
OR McMinnville, Electro-Design 503-472-0481
PA Philadelphia, Eastern Sci. Mktg. 215-368-4570
PA Pittsburgh, Rockford Controls 412-331-0306
SC Greenville, DHR Mktg. Inc. 803-235-3594
TX Lewisville, Jim Hughes Co. 214-221-1536
WA Redmond, Electro-Design 206-867-9300
EXP Burnaby, B.C., Darmac Agencies, Ltd. 604-520-7121
Can Ottawa, Ont., Lloyd Ellam Assocs. 613-727-3892

PAN-MAGNETICS, See Tamura Corp. of America

PAPST

FAX: 401-849-4640

PAPST MECHATRONIC CORP., Aquidneck Indl. Pk., Newport, RI 02840, Tel: 401-849-8810 ... **C•1683-1685**

Local Sales Offices & Reps

AL Huntsville, Robert O. Whitesell & Assocs. 205-883-5110
AZ Phoenix, Jr. Engrg. Sls., Inc. 602-956-4670
CA Campbell, Luscombe Engrg. Co. 408-370-2020
CA Campbell, Papst Mechatronic Corp. 408-377-4842
CA Pasadena, Luscombe Engrg. Co. 213-684-2000
CA San Diego, Luscombe Engrg. Co. 619-549-9699
CO Denver, Quorum 3 3030-750-3267
CT Hartford, Sturgeon Co. 203-249-7800
FL Ovieda, Conley & Assocs. 305-365-3283
GA Norcross, Robert O. Whitesell & Assocs. 404-449-9190
IL Arlington Hgts., Brainard-Wilson Mktg. 312-437-2700
IN Indianapolis, Elctrn. Mktg. Consits. 317-253-1668
IA Marion, MSB Assocs. Inc. 319-377-6261
KS Shawnee Mission, MSB Assocs., Inc. 913-432-2131
MA Needham, Sturgeon Co. 617-444-6603
MN Edina, Mel Foster Tech. Sls., Inc. 612-941-9790
MO St. Charles, MSB Assocs. 314-946-5577
NJ Cherry Hill, Trinkle Sls., Inc. 609-795-4200
NJ Englewood, Harold Gray Assocs., Inc. 201-894-0894,215-922-2080
NY Johnson City, Tech-Mark, Inc. 607-729-
NY Mendon, Tech-Mark, Inc. 716-624-3840
NY Utica, Tech-Mark, Inc. 315-733-0575
NC Greensboro, Robert O. Whitesell & Assocs. 919-273-1945
OH Beachwood, Elctrn. Salesmasters, Inc. 216-831-9555
OR Beaverton, Venture Elctrns. 503-626-7418
TN Knoxville, Robert O. Whitesell & Assocs. 615-694-9476
TX Dallas, JYSCO/Comps., Inc. 214-349-1650
WA Bellevue, Venture Elctrns. 206-454-4594
WI Waukesha, Brainard-Wilson Mktg. 414-797-7940
Can Pickering, Ont., A.C. Simmonds & Sons, Ltd. 416-839-8041

PARACOM INC., Bldg. 9, Unit60, 245 W. Roosevelt Rd., West Chicago, IL 60185, Tel: 312-293-9500, TELEX: 4974811, FAX: 312-231-0015; Empl.: 7; *Sls. Mgr.:* Randy Cochran

PARAGON ELECTRIC CO., INC., 606 Parkway Blvd., Two Rivers, WI 54241, Tel: 414-793-1161, TELEX: 26-3450, FAX: 414-793-3736; Empl.: 500; *Sls. Mgr.:* Don Karman

PARALINE

FAX: 818-281-5867

PARA-LINE TRANSFORMER CO., INC., 511 South Palm Ave., Alhambra, CA 91803, Tel: 818-281-0222; FSC No.: 59465; Empl.: 52 ..... **A•2372**

PARK ELECTRONICS, 16 Xenia Court, Mine Hill, NJ 07801, Tel: 201-328-9299; Empl.: 60; *Sls. Mgr.:* Kelly Faulkenham

PARKER HANNIFIN CORP., 17325 Euclid Ave., Cleveland, OH 44112-1290, Tel: 216-531-3000, TELEX: 980636; Empl.: 33,225

PARKER HANNIFIN CORPORATION, Compumotor Division, 1179 N. McDowell Blvd., Petaluma, CA 94952, Tel: 707-778-1244, 800-358-9068, TWX: 510-744-2155

PARKER MCCRORY MFG. CO., 2000 Forest Ave., Kansas City, MO 64108, Tel: 816-221-2000, FAX: 816-221-9879; *Sls. Mgr.:* Ken Turner; *Dist. Mgr.:* Ken Turner

PARKER SEAL GRP., 18321 Jamboree Blvd., Irvine, California 92715, Tel: 714-851-3763, FAX: 714-851-3277; Empl.: 2,200; *Sls. Mgr.:* Frank Chesnik; *Dist. Mgr.:* John Dutton

PAR-METAL

FAX: 718-439-3930

PAR METAL PRODUCTS, INC., 1260 Atlantic Ave., Brooklyn, NY 11216, Tel: 718-774-5900, TELEX: 424 823 SNDS UI Attn:Par; Empl.: 100; *Sls. Mgr.:* J. Troiano ..... **C•1076**

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TN	Nashville, Staff Co.	216-331-5100
TX	Irving, Kite Elctrns. Sls. Co.	214-986-0321
WI	Hartland, Selective Sls., Inc.	414-367-1133
WI	Milwaukee, Pho-Tronics	414-355-6704
Can	Nepean, Ont., Norgay Entprs., Ltd.	613-723-1858

PHYSICS INTERNATIONAL CO., Olin Defense Systems Grp., 2700 Merced St., San Leandro, CA 94577, Tel: 415-577-7236, TWX: 910-366-7033; Empl.: 360

PIC DESIGN, Remington Technologies, Inc., P.O. Box 1004, Middlebury, CT 06762, Tel: 203-758-8272, TWX: 910-997-0989, FAX: 203-758-8271; FSC No.: 00141; Empl.: 105; *Sls. Mgr.:* George N. Kaniwec

PICO Electronics, Inc.

FAX: 914-699-5565

PICO ELECTRONICS, INC., 453 North MacQuesten Pkwy., Mt. Vernon, NY 10552, Tel: 914-699-5514, 800-431-1064, TWX: 710-562-0113; FSC No.: 31669; *Sls. Mgr.:* Joe Sweeney ..... **A•1278-1285, 2387-2418; D•1947-1970**

Local Sales Offices & Reps

CA	Santa Clara, Fisher Assocs.	408-733-7350
IN	Ft. Wayne, Denton Mktg., Inc.	219-486-0665/1264
WA	Seattle, W. Spaulding Co.	206-282-9173

FAX: 508-649-9643

PICONICS, 26 Cummings Road, Tyngsboro, MA 01879, Tel: 508-649-7501, TELEX: 754759; FSC No.: 26618; Empl.: 48; *Sls. Mgr.:* I. Kadesh ..... **A•1286-1287, 2031**

Local Sales Offices & Reps

AL	Huntsville, Murcota Corp.	205-539-8476
AZ	Scottsdale, Semper-Fi Sls.	602-730-9553
CA	N. Hollywood, Jewett Co.	818-789-8103
CA	Palo Alto, J/M Assocs.	415-857-1260
CO	Parker, Mikro Sls. Co.	303-841-2529
FL	Lighthouse Point, R. C. Simon	305-941-2757
IN	Huntington, Ellet Sls.	219-356-1866
MA	Natick, Wayland Engrg. Sls. Co.	508-655-6080
MN	Minneapolis, Peterson Sls. Assocs.	612-944-0030
MO	Grandview, Harris-Hanson Co.	816-763-6200
MO	St. Louis, Harris-Hanson Co.	314-432-3611
NY	Huntington, Regulus Indl. Sls. Co.	516-673-6252
NY	Rochester, J. G. Welch Assocs.	716-244-1100
OH	Cincinnati, G & H Sls. Co.	513-272-0580
PA	Glenside, Koebert Assocs. Inc.	215-887-2310
TX	Ft. Worth, El-Tec Sls.	817-268-2896
WV	Inswood, R. F. Koebert & Assocs.	304-229-8401

PICOSECOND PULSE LABS, INC., P.O. Box 44, Boulder, CO 80306, Tel: 303-443-1249, FAX: 303-447-2236; Empl.: 16; *Sls. Mgr.:* J.R. Andrews; *Dist. Mgr.:* J.R. Andrews

PIEZO CRYSTAL, 100 K St., Box 619 , Carlisle, PA 17013, Tel: 717-249-2151, TWX: 510-650-2280, FAX: 717-249-7861; FSC No.: 74306; Empl.: 250; *Sls. Mgr.:* Glen R. Kurzenknabe

PIEZO ELECTRIC PRODUCTS, INC., 212 Durham Ave., Metuchen, NJ 08840, Tel: 201-548-2800, TWX: 710-998-0592, FAX: 201-548-2800; Empl.: 95; *Sls. Mgr.:* Mark Rickman

PIEZO KINETICS INC., Box 756, Pine and Mill Streets, Bellefonte, PA 16823, Tel: 814-355-1593, FAX: 814-355-4342; FSC No.: 5Y690; Empl.: 28; *Sls. Mgr.:* H. D. Shirey

PIEZO TECHNOLOGY INC., 2525 Shader Rd., Orlando, FL 32804, Tel: 407-298-2000, TWX: 810-850-4136; FSC No.: 25120; Empl.: 400; *Sls. Mgr.:* Paul Dechen

PIHER INTERNATIONAL CORP., 903 Feehanville Dr., Mt. Prospect, IL 60056, Tel: 312-390-6680, 800-323-6693, TELEX: 4949176, FAX: 312-390-9866; FSC No.: 54869; Empl.: 40; *Sls. Mgr.:* Gus Stoltz; *Dist. Mgr.:* Jackie Hammon ..... **A•2140**

Local Sales Offices & Reps

AL	Huntsville, DHR Mktg.	205-533-5165
NY	Bohemia, Aurora Mktg.	516-563-3131
MN	Minneapolis, Technical Components Grp.	612-536-9512
OH	Medina, Rockford Controls Ohio, Inc.	800-654-4636
MA	S. Weymouth, Adams & Assocs.	617-337-9339
MI	Farmington Hills, Clark Sls.	313-553-0610
MD	Silver Springs, MD Atlantic Sls.	301-593-7749
NC	Raleigh, D.H.R. Mktg.	919-781-1961
SC	Greenville, D.H.R. Mktg.	803-235-3594
TN	Nashville, D.H.R. Mktg.	615-331-2745
VA	Richmond, D.H.R. Mktg.	804-359-8803
WI	PR, San Juan, David S. Ternent	809-762-2688

Local Distributors

AZ	Fountain Hill, RCD Elctrns.	602-483-6412
CA	Anaheim, A.Z. Elctrns.	714-632-1620
CA	Burbank, T.A.W.	818-846-3911
CA	Chatsworth, Petell/Passive	818-700-8838
CA	Fountain Valley, Components Ctr.	714-979-0437
CA	Marina del Rey, N.M.I./Intervend	213-821-7936
CA	Milpitas, California Capacitors	408-262-6000
CA	San Diego, Newman Elctrns.	619-695-3005
CA	San Diego, Sigma General Corp.	619-565-2000
CA	Santa Clara, Components Ctr.	408-988-3751
CA	Van Nuys, E. W. Elctrns.	714-857-4422
CT	Wallingford, Midstate Elctrns.	203-265-9900
FL	Ft. Lauderdale, N.R.C.	305-772-4500
FL	Hialeah, Ibars Elctrns.	305-557-6305
FL	Opalocka, Baron Elec.	305-685-1400
FL	West Melbourne, T. C. Pridmore	407-727-2491
GA	Norcross, Spectrum Elctrns.	404-448-1516
IL	Addison, Belford Elec.	312-691-1100
IL	Arlington Hgts., Mar-Lyn Elctrns.	312-364-7880
IL	Des Plaines, Rangus Elctrns.	312-299-1600
IL	Northbrook, Classic Comps.	312-272-9650
IL	Schaumburg, Components Importer	312-843-7111
IL	Schaumburg, Q.P.S. Elctrns.	312-884-6620
IL	Woodale, Nep. Elctrns.	312-595-8500
IN	Carmel, Advacom(Branch)	317-575-9943
IN	Elkhart, Earlynn Elec. Ind.	219-862-2425
IA	Cedar Rapids, Dee Elctrns.	319-365-7551
KY	Louisville, Peerless Elctrns.	502-637-7674
MD	Gaithersburg, Axis Elctrns.	301-840-9640
MA	Billerica, Mayer Elctrns.	508-667-6900
MA	Middleboro, Glynn Elctrns.	508-947-4262
MA	Wilmington, J.V. Elctrns.	508-657-6523
MI	Grand Rapids, Calder Elctrns.	616-698-7400
MN	Burnsville, Cassidy Elec.	612-895-9026
MN	Eilzen, Capacitor Assocs.	507-495-3130
MN	Minneapolis, Bergquist Co.	612-835-2322
MN	New Brighton, Parts One	612-633-8079
MO	St. Louis, Ric Tronics, Inc.	314-576-9816
NJ	Kenilworth, Federated Purchaser	201-272-0505
NJ	Kenilworth, Ventronics	201-272-9262
NJ	Rockaway, Tonar Inds.	201-586-9000
NJ	W. Berlin, GCI	609-768-6767
NM	Albuquerque, International Elec.	505-291-9951
NY	Buffalo, Summit Elctrns.	716-887-2800
NY	Red Creek, Advacom(Branch)	315-754-8796
NY	Rochester, Masline Elctrns.	716-546-5373
NC	Charlotte, Dixie Elctrns., Inc.	704-377-5413
NC	Raleigh, Resco-Raleigh	919-781-5700
NC	Raleigh, Spectrum (Branch)	919-361-5885
NC	Winston-Salem, Kirkman Elctrns.	919-722-9131
OH	Delaware, Advacom (Branch)	614-369-8843
OH	Parma Hgts., Advacom, Inc.	216-884-4644
OH	Solon, Repco	216-248-8900
OH	Warren, REM Elctrns.	216-373-1300
OR	Portland, A.D. Elctrns. (Branch)	503-644-7324
PA	Erie, REM Elctrns. (Branch)	814-453-5626
PA	Export, Advacom, Inc. (Branch)	412-325-7551
PA	Levittown, G.W. Elctrn. Dist.	215-547-7422
PA	McKean, Advacom	814-476-7774
PA	No. Huntingdon, REM Elctrns. (Branch)	412-864-7423
PA	Yoe, Advacom	717-246-0309
PA	York, Elctrn. Comps.	717-846-5334
SC	Columbia, Dixie Elctrns.	803-779-5332
TN	Knoxville, Dixie Elctrns.	615-938-4131
TX	El Paso, International Elctrns.	915-598-3406
TX	El Paso, REM Elctrns. (Branch)	915-778-7333
TX	Ft. Worth, C & W Supply	817-831-0395
TX	Ft. Worth, Patco Supp. Inc.	817-429-8596
TX	Garland, J.S. Elctrns.	214-487-8808
TX	Richardson, Component Technlg.	214-437-2211
TX	Richardson, RSC Elctrns.	214-644-3444
WI	New Berlin, Classic Comps. (Branch)	414-786-5300
UT	Salt Lake City, Standard Supp.	801-486-3371
WA	Bothell, A.D. Elctrns.	206-481-8555
WA	Redmond, Robert E. Priebe	206-881-2363
WA	Tukwila, Vesco Elctrns.	206-575-3607
WI	Grafton, Lakeview	414-377-8250
WI	New Berlin, Nep. Elctrns.	414-785-9100
WI	Oconomowoc, G. W. Elctrns.	414-367-6003
Can	Burnaby,B.C., S.P.I.	604-438-4811
Can	Markham, Ontario, SPI (Branch)	416-475-5305

FAX: 818-369-2961

PILLAR INDUSTRIES, INC., 15318 E. Valley Blvd., City of Industry, CA 91746, Tel: 818-369-3750, 818-333-8803; Empl.: 3 ..... **D•1972-1975**

Local Sales Offices & Reps

CA	Los Angeles, Power Partner, Inc.	213-215-0800
CA	Santa Cruz, LEREP	408-458-0667

PIND TESTERS INC., 19-B Thomas, Irvine, CA 92718, Tel: 714-380-1551, FAX: 714-951-1269; FSC No.: 66; Empl.: 25; *Sls. Mgr.:* J. Baker

PINE INSTRUMENT CO., 101 Industrial Dr., Grove City, PA 16001, Tel: 412-458-6391, FAX: 412-458-4648; Empl.: 60

PIONEER COMPONENTS, 2352 E. 66th St., Brooklyn, NY 11234, Tel: 718-444-3880; Empl.: 3; *Sls. Mgr.:* Michael R. Verter; *Dist. Mgr.:* Michael R. Verter

Pioneer Magnetics

FAX: 213-453-3929

PIONEER MAGNETICS, 1745 Berkeley St., Santa Monica, CA 90404, Tel: 213-829-6751, TELEX: 182-093, TWX: 910-343-6249; FSC No.: 08676; Empl.: 475; *Sls. Mgr.:* A. Hagiwara, V.P. of Mktg. ..... **D•1976-1977**

Local Sales Offices & Reps

AL	Huntsville, Pen-Tech Assocs.	205-881-9298
AZ	Scottsdale, Williams Assocs.	602-947-4297
CA	Ben Lomond, Pioneer Magnetics	408-335-1042
CA	Los Altos, Frauman Assocs.	415-941-0660
CA	Santa Monica, Pioneer Magnetics, Inc.	213-829-6751
CO	Commerce City, Williams Assocs.	303-289-5647
FL	Boca Raton, Pen-Tech Assocs.	305-394-7400
GA	Marietta, Pen-Tech Assocs.	404-424-1931
IL	Chicago, Heartland Tech. Mktg.	312-577-9222
IN	Milwaukee, Heartland Tech. Mktg.	312-577-9222
MD	Columbia, Stein Instrmn.	301-596-3748
MA	Teaticket, Pioneer Magnetics	508-256-3166
MI	Ann Arbor, KRW Sls., Inc.	313-769-0056
MN	St. Paul, Cahill, Schmitz & Cahill	612-636-7217
MO	Lee's Summit, Omni Tech. Sls.	816-578-4221
NJ	Glen Gardner, Daner-Hayes Inc.	201-537-4534
NM	Albuquerque, Williams Assocs.	505-255-1368
NY	Brewster, Daner-Hayes Inc.	914-279-2168
NY	E. Norwich, Daner-Hayes Inc.	516-922-0080
NY	Pittsford, Comms. Technlg.	716-586-9433
NC	Greensboro, Pen-Tech Assocs.	919-852-6000
OH	Dublin, KRW Sls. Inc.	614-885-2598
OH	Westlake, KRW Sales	216-871-7521
OR	Lake Oswego, RTS, Inc.	503-244-4123
PA	Cheltenham, Stein Instrm.	215-379-1990

PA Oakmont, KRW Sls. Inc. 412-828-1490
TX Dallas, Kruvand 214-437-3355
UT Salt Lake City, Williams Assocs. 801-485-6511
WA Vashon, RTS, Inc. 206-285-1363
Can Lachine, Electrodesign Ltd. 514-636-4838

PIRELLI CABLE CORP., See Specialty Cable Corp.

PITTMAN, Penn Engrg. & Mfg. Corp., 343 Godshall Dr., Harleysville, PA 19438, Tel: 215-256-6601, TELEX: 283668, TWX: 510-661-8696, ESYLNK: 62894738; FSC No.: 98938; Empl.: 160 ..... **B•1295-1297**

Local Sales Offices & Reps
AL Leeds, Motion Technlg., Inc. 205-699-4269
AZ Fountain Hills, Halbar Assocs. 602-837-2464
CA Glendale, Halbar Assocs. 818-246-8263
CA San Mateo, Halbar Assocs. 415-349-4700
CO Englewood, Integrated Motion Sys. 303-792-5516
CT Old Saybrook, M. L. Assocs., Inc. 203-388-9718
FL Palm Bay, Motion Technlg., Inc. 800-438-1380
GA Lilburn, Motion Technlg., Inc. 800-438-1380
IL Mount Prospect, K-W Assocs. 312-253-6680
IN Elkhart, Shaum Mfg., Inc. 219-264-0771
MA Wayland, M. L. Assocs. 617-358-5540
NY Great Neck, Marcus Sls. Assocs., Inc. 516-671-6820
NY Rochester, Application Spec. 716-586-6226
NC Charlotte, Motion Technlg., Inc. 800-438-1380
OH Cleveland, Servo-Mark 216-871-2353
OK Edmond, Motion Reps, Inc. 405-340-8100
PA Exton, Kiley Elect. Co., Inc. 215-363-8550
TX Austin, Motion Reps, Inc. 512-288-5758
TX Denton, Motion Reps, Inc. 817-565-9411
TX Houston, Motion Reps, Inc. 713-981-8700
WA Radford, Motion Technlg., Inc. 703-639-0158
WA Redmond, Halbar Assocs. 206-882-0990
WA Vancouver, Halbar Assocs. 206-696-0170
Can Montreal, Brian Engrg. Ltd. 514-738-5757

PLAINVIEW BATTERIES, INC., 1121 Holland Dr., Ste. 7, Boca Raton, FL 33487, Tel: 407-997-7705, FAX: 407-997-7803; *Sls. Mgr.:* B. Erde ..... **D•1510-1511**

PLAINVIEW ELECTRONICS, See Plainview Battieries, Inc.

PLANT SPECIALTIES, INC., P.O. Box 110537, Carrollton, TX 75011-0537, Tel: 214-245-9673; *Sls. Mgr.:* J. E. Bryer

PLASMA RESEARCH CORP., 5675 Chappell Pl, Oakland, CA 94619, Tel: 415-530-1468; FSC No.: 8Y067; Empl.: 7

PLASTIC CAPACITORS, INC., 2623 N. Pulaski Rd., Chicago, IL 60639, Tel: 312-489-2229, TWX: 910-221-1354, FAX: 312-489-0496; FSC No.: 99120; Empl.: 90; *Sls. Mgr.:* Thomas J. Brown; *Dist. Mgr.:* Thomas J. Brown

Local Sales Offices & Reps
AL Huntsville, B.J.R., Inc. 205-881-3569
AZ Phoenix, The Knight Co. 602-994-1311
CA Los Angeles, The Knight Co. 213-670-2833
CA Palo Alto, Horne Electro Sls., Inc. 415-494-6777
CO Broomfield, Technet Sls. & Svcs., Ltd. 303-466-7777
CT E. Haven, Eagle Assocs. 203-467-6542
FL Longwood, Mathias Assocs., Inc. 305-682-1700
IL Elk Grove Village, Carlson Elctrn. Sls. Co. 312-956-8240
IN Fort Wayne, W. W. Bieberich, Inc. 219-432-2537
IA Cedar Rapids, Carlson Elctrn. Sls. Assocs. 319-378-1450
MD Baltimore, Eastern Comps. Sls. Corp. 301-788-7050
MA Pinehurst, Eagle Assocs. 617-444-3446
MN Wayzata, Cardinal Sls. Co. 612-475-0042
NJ Springfield, F. F. Sylvester Assoc. 201-376-3324
NY Rochester, APEX Assocs., Inc. 716-272-7040
OR Tigard, Components West, Inc. 503-684-1671
PA W. Conshohocken, Eastern Comps. Sls. Corp. 215-825-8610
TX Seagoville, Delta Comps., Inc. 214-287-6333
WA Redmond, Components West, Inc. 206-885-5880
WI Milwaukee, Carlson Elctrn. Sls. Co. 414-476-2790

PLASTIC FORMING, 20 S. Bradley Rd., Woodridge, CT 06525, Tel: 203-397-1338, TELEX: 963437, FAX: 203-389-0420; Empl.: 80; *Sls. Mgr.:* Bruce J. Dokurno

PLASTICORP, 24105 S. Frampton Ave., Harbor City, CA 90710, Tel: 213-539-9530, FAX: 213-539-8325; Empl.: 120; *Sls. Mgr.:* Robert Hurley

PLASTIMATIC, INC., Glynwed Int'l., 3 Oak Rd., Fairfield, NJ 07006, Tel: 201-575-0038, FAX: 201-575-8748; Empl.: 95; *Sls. Mgr.:* B. Matthews

PLASTOID CORPORATION, 45 Gingerbread Castle Rd., Hamburg, NJ 07419, Tel: 201-827-7141, FAX: 201-827-7141 (ext 52); Empl.: 200

PLATO PRODUCTS, INC., 2120 E. Allen Ave., Glendora, CA 91740, Tel: 800-423-4510, TELEX: 287291, FAX: 714-592-7062; FSC No.: 32399; Empl.: 75; *Sls. Mgr.:* Walter Schaub

PLESSEY ELECTRONIC SYSTEMS CORP., 164 Totowa Rd., Wayne, NJ 07470, Tel: 201-633-6000, FAX: 201-633-6167; FSC No.: 0D0D0; Empl.: 2700; *Sls. Mgr.:* M. G. Gordon, VP

PLETRONICS, INC., 9026 Roosevelt Way N.E., Seattle, WA 98115, Tel: 206-523-9395, FAX: 206-525-2350; Empl.: 125; *Sls. Mgr.:* Les Podgorny; *Dist. Mgr.:* Les Podgorny ..... **A•1464-1467**

Local Sales Offices & Reps
CA Mission Viejo, Jay Mktg. Assocs. 714-768-7519
CA Pleasanton, Moulthrop 415-463-0450
CO Aurora, Electrodyne 303-695-8903
CT Cheshire, Nesco 203-272-0368
FL Orlando, MacKay, Smith & Assocs. ... 305-423-4353
GA Tucker, MacKay, Smith & Assocs. 404-496-9913
IL Woodridge, Trend-Tronics 312-985-0626
MD Baltimore, Chesapeake Ind. Mktg. 301-653-0476
MA Randolph, Bengal 617-961-4120
MN St. Paul, Countryman 612-645-9151
NJ Springfield, Radix 201-467-4970
NC Raleigh, MacKay, Smith & Assocs. 919-847-2277
OH Centerville, Omega 513-434-5507
OH Shaker Hgts., Omega 216-751-9600
TX Austin, Sage Mktg. 512-335-0300
UT Salt Lake City, Electrodyne 801-264-8050
WA Redmond, Halbar 206-882-0990

Local Distributors
CA El Segundo, Force 213-772-1324
CA Fullerton, Pyramid 714-773-0781
CA Orange, Target Elctrns. 714-639-1418
CA San Diego, Pyramid 619-271-5404
CA San Jose, Force 408-435-1324
CA Santa Clara, Pyramid 408-727-9810
CA Sunnyvale, Capsco 408-734-3020
CA Sunnyvale, Target 408-734-5611
CT Norwalk, Cobra Comps. 203-847-6442
FL West Melbourne, Pridmore Corp. 407-727-2491
IL Woodridge, Trend-Tronics 312-985-0626
MD Beltsville, PSI 301-937-4960
MA Middleboro, Glynn Elctrns. 617-947-4262
MA Norwood, Gerber Elctrns. 617-947-4262
MA Woburn, First Frequency 617-933-7386
MN Fridley, Voyager 612-571-7766
NY Stony Brook, Dove Elctrns. 516-689-7733
NC Raleigh, Century Elctrns. 919-782-2116
PA Norristown, Century Elctrns. 215-631-5400
WA Redmond, Priebe 206-801-2363
WA Redmond, Pyramid 206-883-7200

PLUMER PRECISION OPTICS, 601 Montgomery Ave., Pennsburg, PA 18073, Tel: 215-679-6272, FAX: 215-679-2277; Empl.: 180; *Sls. Mgr.:* Max Haskins

PMI MOTION TECHNOLOGIES, 49 Mall Dr., Commack, NY 11725-5703, Tel: 516-864-1000, TWX: 510-233-0007, FAX: 516-864-2084; Empl.: 250; *Sls. Mgr.:* Peter Dougherty

POCO SLS., Porter Co., 8925 Fullbright St., Chatsworth, CA 91311, Tel: 818-700-8727, FAX: 818-700-8453; FSC No.: 69-1603; Empl.: 8

POINT 4 DATA CORP., 15442 Del Amo Ave., Tustin, CA 92680, Tel: 714-259-0777, TELEX: 4722040; Empl.: 180; *Sls. Mgr.:* Mr. Ted Cooper; *Dist. Mgr.:* Mr. Ted Cooper

POLARA ENGINEERING INC., 4115 W. Artesia Ave., Fullerton, CA 92633, Tel: 714-521-0900, TELEX: 688489, FAX: 714-522-8001; Empl.: 62

POLAROID CORPORATION, Polarizer Div., 1 Upland Rd., Norwood, MA 02062, Tel: 800-225-2770, FAX: 617-446-4600

POLYCASE PRODS., ECP Corp., 4726 Superior Ave, Cleveland, OH 44103, Tel: 216-391-0444, FAX: 216-391-2891; Empl.: 14 ..... **C•1077**

POLY CIRCUITS, INC., 215 Park St., Bensenville, IL 60106, Tel: 312-860-3560, FAX: 312-860-5350; Empl.: 125; *Sls. Mgr.:* Will Allen

POLYCORE ELECTRONICS, 1107 Tourmaline Dr., Newbury Pk., CA 91320, Tel: 805-499-6777, TWX: 910-336-1547, FAX: 805-499-6017; Empl.: 40; *Sls. Mgr.:* S.K. Leong

POLYMER CORP., 2120 Fairmont Ave., Reading, PA 19605, Tel: 215-320-6600, TELEX: 836-440, TWX: 510-651-5696, FAX: 215-320-6866; Empl.: 1000; *Sls. Mgr.:* R. A. Alberts; *Dist. Mgr.:* R. F. Wagner

POLYPHASE INSTRUMENT, 175 Commerce Dr., Ft. Washington, PA 19034, Tel: 215-643-6950, FAX: 1-215-643-5237; FSC No.: 98330; Empl.: 200; *Sls. Mgr.:* Bert Rashkow ..... **A•2420-2421**

Local Sales Offices & Reps
CA Chatsworth, WCV-Raltech Inc. 818-700-0933
FL Longwood, Beacon Assoc. 407-332-1940
iA Cedar Rapids, Lorenz Sls. Inc. 319-377-4666
KS Overland Pk., Lorenz Sls. Inc. 913-649-5556
MA Brookline, Technlg. Prods. Grp. 617-731-0858
MO University City, Lorenz Sls. Inc. 314-997-4558
NE Lincoln, Lorenz Sls. Inc. 401-475-4660
NJ Madison, Livera Polk Assocs., Inc. 201-377-3220
NY Glen Head, Livera Polk Assocs., Inc. .. 516-759-9300
PA Erdenheim, Omni Sls. 215-233-4702
TX Austin, Mil-Rep Assocs., Inc. 512-346-6331
TX Richardson, Mil-Rep Assocs., Inc. 214-644-6731

POLYPHASER CORPORATION, 1425 Industrial Way, P.O. Box 1237, Gardnerville, NV 89410-1237, Tel: 702-782-2511, 800-325-7170, TELEX: 272718 PolyPhaser, FAX: 702-782-4476 ..... **B•1405**

Local Sales Offices & Reps
CA Fallbrook, Gov. Comms. Mktg. 619-728-2530
CA Sacramento, JN Sls. 916-635-5899
CO Aurora, Electro-Tek Sls., Inc. 303-343-8020
FL Coral Springs, Cemco 305-753-6777
GA Atlanta, Cemco 404-491-0520
HI Honolulu, Manon Engrg. 808-833-9545
IN Greenfield, Webster Assocs., Inc. 317-326-8575
KS Olathe, Maury E. Bettis Co. 913-764-0621
KY Louisville, Webster Assocs. 502-937-8189
LA Houma, Horizon Comm. Sls. Co. 504-868-7629
MI Rochester, Webster Assocs., Inc. 313-375-0420
MN Stillwater, Ned Gordon & Assocs. 612-430-1572
NV Gardnerville, PolyPhaser Corp. 702-782-2511
NH Manchester, Assocd. Sys. 603-472-2297
NJ Totowa, Holzberg Inc. 201-256-8555
NM Rio Rancho, Webster Assocs. 505-892-4969
NY Ossining, Webster Assocs. 915-762-0136
NC Black Mountain, Cemco 704-669-4777
OK Tulsa, Horizon Comm. Sls. Co. 918-252-7222
PA Venetia, Webster Assocs. 412-941-8848
TX Houston, Horizon Comm. Sls. Co. 713-495-1018
TX Rowlett, Horizon Comm. Sls. Co. 214-475-1179
WA Kirkland, Manon Engrg. 206-827-7449

Local Distributors
CA Sacramento, Sacramento Elctrns. 916-441-4821
CO Aurora, Electro-Comm Distrs. 303-343-8937
HI Honolulu, Honolulu Elec.
ID Idaho Falls, Teton Comms. 208-522-0750
IL Joliet, Primus Elctrns. Corp. 815-436-8945
MI Detroit, Adams Distrbg. Co. 313-584-6640
MO Springfield, Communications Assocs. 417-882-1401
NE Lincoln, Dynocom-Tower Maintenance 712-255-9010
NV Carson City, Schwartz Radio, Inc. 702-883-4500
NV Gardnerville, PolyPhaser Corp. 702-782-2511
NC Greensboro, West Antenna 919-621-2473
TX Rowlett, Horizon Comm. Sls. Co. 214-475-1179
VA Blacksburg, Professional Comms. 703-552-4443

POLY-PLANAR INC., 1800 Mearns Rd.,Unit J-P.O. Box 2578, Warminster, PA 18974, Tel: 215-675-7805; Empl.: 12

POLYPLY INC., Rd. No. 1, Route 5 South, Amsterdam, NY 12010, Tel: 518-843-3900, FAX: 518-843-5829; *Sls. Mgr.:* B. Slomski

POLYTRON DEVICES, INC

FAX: 201-345-1264

POLYTRON DEVICES, INC., Box 398 - River St. Sta., Paterson, NJ 07544, Tel: 201-345-5885; Empl.: 26 ..... **D•1979-1983**

Local Sales Offices & Reps
CA Huntington Bch., Mil-Com Sls. 714-840-2424
CA Huntington Beach, Mil-Com Sls. 714-840-2424
CA San Jose, P & M Elctrns. 408-287-0402
NY Canandaigna, Mamula Sls. 716-394-5560
NY Canandaigua, Mamula Sls. 716-394-5560

POMFRET RESEARCH OPTICS, P. O. Box 1265, Orange, VA 22960, Tel: 703-854-4350; Empl.: 5

POMONA

FAX: 714-629-3317

POMONA ELECTRONICS, 1500 E. 9th St., P.O. Box 2767, Pomona, CA 91766, Tel: 714-623-3463, TWX: 910-581-3822; FSC No.: 05276; Empl.: 170; *Sls. Mgr.:* Thomas Barber; *Dist. Mgr.:* Thomas Barber ..... **C•1477-1505, 1623**

Local Sales Offices & Reps

AL	Hazel Green, Braden & Assocs.	205-828-6290
AZ	Phoenix, More Sls.	602-788-9181
AR	Little Rock, Erickson Sls., Inc.	501-455-0618
CA	Burbank, Darco	818-504-2425
CA	Irvine, Vale Elctrn. Assocs.	714-551-4004
CA	Santa Clara, Engrg. Assocs. Corp.	408-988-5001
CA	So. San Francisco, Carelli/EMA	415-873-2524
CO	Broomfield, Connors Co.	303-466-9628
FL	Maitland, EIR Inc.	407-660-9600
IL	Deerfield, W. M. Linz	312-945-9600
IN	Indianapolis, Blind Elctrn. Sls. Co.	317-241-3742
IA	West Des Moines, Nevco	515-225-9866
LA	Chalmette, Erickson Sls., Inc.	504-271-1976
MD	Baltimore, David S. Linz, Inc.	301-727-6651
MA	Foxboro, Al Appell Assoc., Inc.	617-784-3439, 508-543-1109
MI	Jenison, C. A. Geer Co.	616-534-9449
MI	Kentwood, C. A. Geer Co.	616-534-9449
MN	Minneapolis, Hei-lite Sls., Inc.	612-861-6051
MO	Crestwood, Nevco, Inc.	314-843-7406
OH	Eastlake, Spectrum Technlg.	216-951-4455
MO	Independence, Nevco, Inc.	816-478-4582
NJ	Belleville, D. F. Tobias & Co.	201-751-8680
OR	Beaverton, Eclipse Mktg. Grp. Ltd.	503-642-1661
PA	Philadelphia, David S. Linz, Inc.	215-379-0734
SC	Greenville, Hal C. Norman Sls. Co.	803-244-6254
TX	Dallas, Erickson Sls., Inc.	214-739-5833
TX	Houston, Erickson Sls., Inc.	713-266-1604
TX	Round Rock, Erickson Sls., Inc.	512-244-3068
WA	Redmond, Eclipse Mktg. Grp., Ltd	206-885-6991
WA	Spokane, Eclipse Mktg. Grp., Ltd.	509-928-2903
EXP	CA, Tarzana, Nate Beckerman & Co., Inc.	818-708-0021
Can	Whitby, ITT Cannon Canada	416-668-8881

PORTESCAP U.S., INC., 36 Central Ave., Hauppauge, NY 11788, Tel: 516-234-3900, FAX: 516-234-3986; Empl.: 16; *Sls. Mgr.:* Dave Hall

POSITRONIC INDUSTRIES, INC., 423 N. Campbell St., P.O. Box 8247, Springfield, MO 65801, Tel: 417-866-2322, TELEX: 436445, FAX: 417-866-4115; FSC No.: 28198; Empl.: 300

Local Sales Offices & Reps

AZ	Phoenix, Jarko Assocs.	602-243-4387
CA	Fallbrook, Gary Chilcote & Assocs.	619-728-7678
CA	Irvine, J.V. Earley & Assocs.	714-833-1806
CA	Los Angeles, Positronic Inds.	714-528-4103
CA	Redwood City, Positronic Inds.	415-366-0483
CA	San Jose, Arnold Technical Sales	408-954-0400
CO	Englewood, Romtech, Inc.	303-779-0291
FL	Lakeland, Positronic Ind. inc.	813-859-3941
MD	Gaithersburg, Carwithen Assoc.	301-921-9545
MN	Minneapolis, R K Sls.	612-571-1001
MO	Springfield, David Ray	417-866-2322
NH	Merrimack, Positronic Inds., Inc.	603-882-8718
NH	Salem, Sls. Engrg. Co.	603-893-5521
NJ	Wyckoff, N.E. Comps.	201-848-1100
NY	Whallon Tool & Services	
NY	Unadilla, Positronic Inds.	607-563-1021
NC	Raleigh, R.W. Mitscher Co., Inc.	919-848-9156
TX	Dallas, Positronic Inds.	817-540-5448

Local Distributors

AL	Huntsville, Mobile Elctms.	205-533-1942
CA	Campbell, Applied Specialties	408-370-2644
CT	Norwalk, Cobra Comps.	203-847-6442
MD	Columbia, Aztech Elctms.	301-995-6800
MA	Canton, Electronic Packaging Corp.	617-821-2111
MI	Fraser, Madison Elctms.	313-294-8300
NJ	Bellmawr, Mid-Atlantic Elec. Corp.	609-931-5303
NY	Copiague, Restart Elctms.	516-842-1500
OH	Wickliffe, Gateway Megatech	216-953-0333
PA	Philadelphia, Shap Electronics	215-969-3300
PA	Philadelphia, Sharp Electronics	215-969-3300
WA	Redmond, Pan Pacific Electronics	206-881-7252

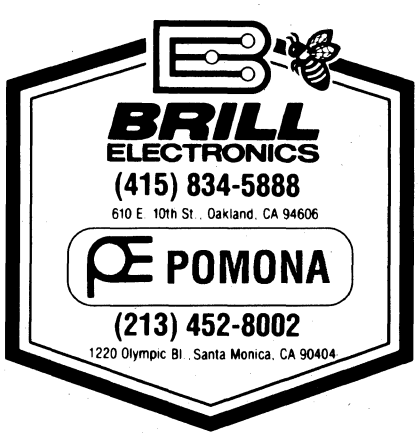
P&B

FAX: 812-386-2335

POTTER & BRUMFIELD, A Siemens Co., 200 S. Richland Creek Dr., Princeton, IN 47671-0001, Tel: 812-386-1000, TELEX: 27-8451, TWX: 810-350-2343; Empl.: 3000; *Sls. Mgr.:* Don Patton; *Dist. Mgr.:* Sherry Colborn ..... **B•1406, 1597-1613**

Local Sales Offices & Reps

AL	Huntsville, Cartwright & Bean	205-830-1540
AZ	Phoenix, Howe & Howe Sls.	602-264-7971
CA	Los Altos, Recht Assocs.	415-964-6321
CA	Mission Viejo, Potter & Brumfield-Western U.S.	714-582-1231
CA	San Diego, CERCO	619-450-1754
CA	Santa Ana, Jones & McGeoy Sls., Inc.	714-547-6466
CO	Littleton, Simpson Assocs.	303-794-8381
FL	Deerfield Beach, Cartwright & Bean	305-429-3400
FL	Orlando, Cartwright & Bean	305-422-4531
GA	Norcross, Cartwright & Bean	404-368-0160
IL	Rolling Meadows, Sumer, Inc.	312-991-8500
IN	Fort Wayne, R. O. Whitesell & Assocs.	219-432-5591
IN	Indianapolis, R. O. Whitesell & Assocs.	317-359-9283
IN	Kokomo, R. O. Whitesell & Assocs.	317-457-9127
IN	Princeton, Potter & Brumfield-Central U.S.	812-386-2130
IA	Cedar Rapids, Dy-Tronix, Inc.	319-377-8275
KS	Leawood, Dy-Tronix, Inc.	913-339-6333
KS	Wichita, Dy-Tronix, Inc.	316-838-0884
KY	PeeWee Valley, R. O. Whitesell & Assocs.	502-241-1441
LA	Covington, Cartwright & Bean	504-892-1780
MD	Baltimore, Micro-Comp	301-644-5700
MA	Braintree, Potter & Brumfield-Eastern U.S.	617-848-6550
MA	Framingham, Gallagher Assocs., Inc.	617-626-2346
MI	Grand Blanc, R. O. Whitesell & Assocs.	313-695-0770
MI	Grand Rapids, R. O. Whitesell & Assocs.	616-942-5420
MI	Southfield, R. O. Whitesell & Assocs.	313-559-5454
MI	St. Joseph, R. O. Whitesell & Assocs.	616-983-7337
MN	Edina, Mel Foster Tech. Sls.	612-941-9790
MS	Jackson, Cartwright & Bean	601-981-1170
MO	Bridgeton, Dy-Tronix, Inc.	314-291-4777
NJ	Medford, The McCoy Grp., Inc.	609-953-0770
IN	Princeton, Potter & Brumfield-Southern U.S.	812-386-2211
NM	Albuquerque, C. T. Carlberg & Assocs.	505-888-3883
NY	Kingston, Micro-Tech Mktg. Inc.	914-338-7588
NY	Melville, Comtronic Assocs.	516-249-0505
NY	N. Syracuse, Micro-Tech Mktg. Inc.	315-458-5254
NY	Rochester, Micro-Tech Mktg. Inc.	716-328-3000
NC	Charlotte, Cartwright & Bean	704-536-0303
NC	Raleigh, Cartwright & Bean	919-876-4130
OH	Cincinnati, R. O. Whitesell & Assocs.	513-521-2290
OH	Cleveland, R. O. Whitesell & Assocs.	216-447-9020
OH	Columbus, R. O. Whitesell & Assocs.	614-888-9396
OH	Dayton, R. O. Whitesell & Assocs.	513-298-9546
OK	Tulsa, Components, Inc.	918-583-9149
PA	Exton, The McCoy Grp., Inc.	215-363-0350
PA	Harrisburg, Beil & Whitaker	717-564-6900
PA	Philadelphia, The McCoy Grp., Inc.	800-257-5388
PA	Pittsburgh, R. O. Whitesell & Assocs.	412-963-6161
TN	Knoxville, Cartwright & Bean	615-693-7450
TN	Memphis, Cartwright & Bean	901-362-8345
TX	Austin, Ammon & Rizos Co.	512-454-5131



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WA Seattle, Northmar, Inc. 206-524-5170
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Can Burlington, Ont., White Radio Ltd. 416-632-6894

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POWERBOX INC., 1503 Spruce St, Boulder, CO 80302, Tel: 303-444-1461, 800-444-1461, FAX: 303-444-3135; *Sls. Mgr.:* James Jones ..... **C•1078**

Local Sales Offices & Reps
MA Boston, Tech. Instrs. 617-944-3930
MN St. Paul, Heyda/Hanks Assocs. 612-484-8531

POWER CARD CORP., 391 Totten Pond Rd., Waltham, MA 02159, Tel: 617-890-6789, TELEX: 948073, FAX: 617-890-1390; *Sls. Mgr.:* Fredric Cohen

POWER COMPONENTS CO., Vanguard Electronics Co., 1480 W. 178th St, Gardena, CA 90248, Tel: 213-323-8120, TWX: 910-346-7067, FAX: 213-329-8427; FSC No.: 213-329-8427; *Sls. Mgr.:* Ken Finley

POWER CONVERSION, INC., Hawker Siddeley Group, Ltd.-London, England, 280 Midland Avenue, Saddle Brook, NJ 07662, Tel: 201-796-4800, TELEX: 130292, FAX: 201-796-5777; Empl.: 700; *Sls. Mgr.:* James Sullivan, V.P. Sls.; *Dist. Mgr.:* Lori Forkan ..... **D•1513**

POWER CONVERSION PRODUCTS, 42 East St, Box 380, Crystal Lake, IL 60014, Tel: 815-459-9100, TWX: 910-634-3356, ESYLNK: 62940261, FAX: 815-459-9118; FSC No.: 31751; Empl.: 150; *Sls. Mgr.:* C. Seyer

POWERCUBE CORP., Sub. Unitrode Corp., 8 Suburban Pk. Dr., Billerica, MA 01821, Tel: 617-667-9500, FAX: 508-667-6280; FSC No.: 31557; Empl.: 200; *Sls. Mgr.:* Roger LaFontaine

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Local Distributors

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CA	Los Angeles, EIL Instrs.	213-685-7020
CA	N. Hollywood, O'Halloran Assocs.	213-877-0173
CA	Palo Alto, O'Halloran Assocs.	415-969-1600
CA	Santa Clara, EIL Instrs.	408-727-0396
CO	Denver, EIL Instrs.	303-534-4160
CT	Middletown, EIL Instrs.	203-346-6646
FL	Palm Bay, EIL Instrs.	305-725-8300
GA	Atlanta, U.S. Instr. Rentals	404-955-4473
IL	Chicago, EIL Instrs.	312-430-2292
IN	Indianapolis, EIL Instrs.	317-545-1373
KS	Kansas City, U.S. Instr. Rentals	913-677-0011
KY	Louisville, EIL Instrs.	502-454-3420
MD	Sparks, EIL Instrs.	301-771-4800
MA	Burlington, EIL Instrs.	617-272-9450
MI	Detroit, U.S. Instr. Rentals	313-493-1919
MN	Minneapolis, U.S. Instr. Rentals	612-881-3743
MO	St. Louis, U.S. Instr. Rentals	314-454-0210
NJ	Belmar, Accutest Instrs.	201-681-6560
NJ	Rockaway, A&J Assocs.	201-625-3169
NM	Albuquerque, U.S. Instr. Rentals	505-884-0529
NY	Great Neck, The Instr. Mart	516-487-7430
NY	Hauppauge, EIL Instrs.	516-231-6333
OH	Cincinnati, U.S. Instr. Rentals	513-863-4446
OH	Dayton, EIL Instrs.	513-435-2134
OK	Oklahoma City, U.S. Instr. Rentals	405-525-2659
PA	Philadelphia, EIL Instrs.	609-488-0474
TX	Dallas, EIL Instrs.	214-931-1236
TX	Houston, EIL Instrs.	713-271-3100
UT	Salt Lake City, U.S. Instr. Rentals	801-582-0116
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Local Sales Offices & Reps

CA	Agoura, Westpower Assocs.	818-706-2550
CA	Del Mar, Westpower Assocs.	619-481-3721
CA	Laguna Hills, Westpower Assocs.	714-582-6716
CA	Santa Clara, Engrg. Assocs.	408-988-5001
CT	Cheshire, Eva-Tec Mktg.	203-272-4234
GA	Alpharetta, Southeast Power Comps.	404-664-5460
GA	Norcross, Southeast Power Comps.	404-448-2458
IL	Chicago, L&W Power Corp.	312-852-6464
IL	Naperville, L & W Power Corp.	312-416-9969
MD	Baltimore, Delta Tech. Sls. Co.	301-655-2533
MI	Detroit, L & W Power Corp.	313-451-1150
MN	Hopkins, Steve Forsythe & Assoc.	612-933-8267
NH	Amherst, Eva-Tec Mktg.	603-673-4830
NJ	Ringwood, JL Sls. Assocs.	201-962-6315
NY	Ronkonkoma, JL Sls. Assocs.	516-737-2801
NC	Charlotte, S.E. Power Comps.	704-846-8532
NC	Greensboro, S.E. Power Comps.	919-275-4711
NC	Henderson, Southeast Power	919-438-4450
OH	Wickliffe, Walter J. Brauer & Assoc.	612-933-8267
OK	Tulsa, Nova Mktg.	918-660-5105
OR	Tigard, Vantage Corp.	503-620-3280
PA	Hatboro, Delta Tech. Sls., Inc.	215-957-0600
TX	Austin, Nova Mktg.	512-343-2321
TX	Dallas, Nova Mktg.	214-750-6082
TX	Houston, Nova Mktg.	713-988-6082
WA	Bellevue, Vantage Corp.	206-455-3460
WV	Charleston, Burl Burgess & Assocs.	304-465-0742
WI	Milwaukee, L & W Power Corp.	414-782-0799
Can	Montreal, Gidden-Morton Assocs.	514-335-9572
Can	Ottawa, Gidden-Morton Assocs.	613-838-4480
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POWER DYNAMICS INC., 59 Lakeside Ave., P.O. Box 539, West Orange, NJ 07052, Tel: 201-736-5722, TELEX: 666173(PDI), FAX: 201-736-8930; FSC No.: 60046; *Sls. Mgr.:* James Papianni; *Dist. Mgr.:* Lyle Scott ... **A•1666; C•1506-1509, 1916; D•1514-1515**

Local Sales Offices & Reps

AL	Huntsville, Electro Sls., Inc.	205-883-9648
CA	Laguna Niguel, David Budge & Assoc.	714-582-8720
CA	Mountain View, Bart Budge Assocs.	415-961-0940
CA	San Diego, David Budge Assocs.	619-471-2554
CO	Broomfield, SummitWest Mktg.	303-460-9600
FL	Miramar, Dan-Tech Sls., Inc.	305-963-6142
GA	Atlanta, Electro Sls., Inc.	404-394-1122
IL	Palatine, Golbeck & Milota Assocs., Inc.	312-705-0602
KS	Shawnee Mission, Microtronics, Inc.	913-262-1444
MD	Baltimore, Muncy-Semless Assocs.	301-484-6376
MI	Grand Rapids, R.P. Urban Assocs.	616-245-0511
MN	Minneapolis, RK Sls.	612-571-1001
MO	St. Charles, Microtronics, Inc.	314-946-8500
NH	Amherst, D.A. Crowley & Assocs	603-673-7050
NJ	Pt. Pleasant, Jade Mktg.	201-899-8108
NY	Fayetteville, C. W. Floring Assocs., Inc.	315-637-4552
NY	Scottsville, C. W. Floring Assocs., Inc.	716-889-4614
NC	Raleigh, Barker Assocs.	919-876-0282
OH	Kettering, Electro-Com	513-299-0864
OH	Mansfield, Electro-Com	419-756-5746
OR	Tigard, Electronic Comp. Sls.	503-245-2342
NJ	W. Berlin, Muncy-Semless Assocs.	609-346-4402
TX	Dallas, Rem-Air Comp.	214-234-1069
UT	Salt Lake City, Aspen Sls., Inc.	801-467-2401
WA	Mercer Island, Elctrn. Comp. Sls.	206-232-9301
PR	Old San Juan Stn., Casanova Indl. Sls. Corp.	809-753-8674
Can	Downsview, Tienkay, Inc.	416-736-1221

Local Distributors

AR	Ft. Smith, Radio, Inc.	501-646-5200
CA	Chatsworth, Fuses Unltd.	818-882-1515
CA	El Segundo, Force Elctrns.	714-522-1324
CA	Livermore, Fuse-Com	415-449-1313
CA	Mountainview, Energy Sls.	415-969-0800
CA	San Diego, Fuses Unlimited/Western Fuse	619-569-9620
CA	San Diego, Sigma Elctrns.	619-565-2000
CA	San Jose, Force Elctrns.	408-435-1324
CA	San Jose, Rose Elctrns.	408-943-0200
CA	So. San Francisco, Peters-DeLaet, Inc.	415-873-9595
CO	Arvada, Denver Wintronics	303-431-7161
CT	Hamden, Connector Co.	203-288-0044
CT	Wallingford, Sager Elect. Supp. Co.	203-265-4600
FL	Ft. Lauderdale, KSM Elctrns.	305-971-5900
FL	Ft. Lauderdale, Stock Elctrns.	305-978-9875
GA	Atlanta, KSM Elctrns.	404-458-2013
IL	Crystal Lake, Sub-Sem	312-782-3954
MA	Canton, Impact Sls.	617-821-1500
MA	Framingham, Now Elctrns.	617-872-5876
MA	Hingham, Sager Elect. Supp. Co.	617-749-6700
MI	Troy, Empire Elctrns	313-585-8130
MN	New Brighton, Parts I	612-633-8079
MO	St. Louis, Beckwith Elctrns.	314-343-6463
NJ	Englewood Cliffs, Castle Inds.	201-592-0200
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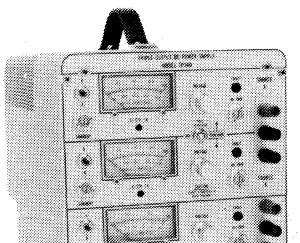

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OH Cleveland, Pioneer Elctrns. 216-587-3600
OH Dayton, Bell Inds. 513-435-8660
OH Dayton, Bell Inds. (Military) 513-434-8231
OH Dayton, Pioneer Elctrns. 513-236-9900
OH Solon, Arrow Elctrns. 216-248-3990
OK Tulsa, Arrow Elctrns. 918-252-7537
OK Tulsa, Sterling Elctrns. 918-663-2410
OR Beaverton, Arrow Elctrns. 503-645-6456
OR Portland, Bell Inds. 503-635-6500
OR Portland, Radar Elec. 503-232-3404
OR Portland, Wyle Labs. 503-640-6000
PA Horsham, Pioneer Elctrns. 215-674-4000
PA Monroeville, Arrow Elctrns. 412-856-7000
PA Pittsburgh, CAM/RPC Elctrns. 412-782-3770
PA Pittsburgh, Pioneer Elctrns. 412-782-2300
RI Warwick, Major Edwards Elctrns. 401-725-7400
TN Nashville, Bell Inds. 615-367-4400
TX Austin, Arrow Elctrns. 512-835-4180
TX Austin, Pioneer Elctrns. 512-835-4000
TX Austin, Sterling 512-836-1341
TX Austin, Wyle Labs. 512-834-9957
TX Carrollton, Arrow Elctrns. 214-380-6464
TX Dallas, Force Elctrns. 214-247-9955
TX Dallas, Pioneer Elctrns. 214-386-7300
TX Dallas, Sterling Elctrns. 214-243-1600
TX Dallas, Wyle Labs. 214-235-9953
TX Houston, Arrow Elctrns. 713-530-4700
TX Houston, Force Elctrns. 713-561-8644
TX Houston, Pioneer Elctrns. 713-988-5555
TX Houston, Sterling Elctrns. 713-623-6600
TX Houston, Wyle Labs. 713-879-9953
UT Salt Lake City, Arrow Elctrns. 801-973-6913
UT Salt Lake City, Bell Inds. 801-255-9611
UT Salt Lake City, Wyle Labs. 801-974-9953
VA Richmond, Sterling Elctrns. 804-226-2190
VA Sterling, Sterling Elctrns. 703-742-8400
WA Bellevue, Bell Inds. 206-747-1515
WA Kent, Arrow Elctrns. 206-575-4420
WA Richardson, Radar Elec. 509-747-3053
WA Seattle, Radar Electric 206-282-2511
WA Seattle, Wyle Labs 206-881-1150
WA Spokane, Radar Elec. 509-747-3053
WI Brookfield, Arrow Elctrns. 414-792-0150
WI New Berlin, Classic Comps. 414-786-5300
WI Waukesha, Bell Inds. 414-547-8879
EXP CA, Los Angeles, Hanex, Inc. 213-556-3807
TX Austin, Advance Tech. Sls. 512-467-9209

POWER PAC INC.

FAX: 203-866-4487

POWER PAC, P.O. Box 777, 32 Meadow St., S. Norwalk, CT 06856-0777, Tel: 203-866-4484; FSC No.: 53998; Empl.: 140; *Sls. Mgr.:* Charles Mittel

POWER-PAK, INC., 6216 Oakton St., Morton Grove, IL 60053, Tel: 312-966-6000, FAX: 312-966-6009; Empl.: 35; *Sls. Mgr.:* Robert Villari ..... **D•1516**

POWER PRODUCTS DIV., COMPUTER PRODS./POWER PRODS., See Computer Prods. Inc., Fremont, CA.

POWER-SCIENCE, 7667 Vickers St., San Diego, CA 92111, Tel: 619-292-4322; Empl.: 10; *Sls. Mgr.:* E. Cooper

POWER SONIC
RECHARGEABLE BATTERIES

FAX: 415-366-3662

POWER-SONIC, Box 5242, 3106 Spring St., Redwood City, CA 94063, Tel: 415-364-5001, TELEX: 348400; Empl.: 50; *Sls. Mgr.:* Carl E. Fischetti; *Dist. Mgr.:* Carl E. Fischetti ..... **D•1517**

Local Sales Offices & Reps
CA Irvine, English/Damco 714-837-3801
CO Denver, Rick Moody 303-893-3771
FL Tampa, SRT Mktg. 813-884-4805
IL Hinsdale, Pete Collins 312-325-9888
MD Woodbine, DJC Elctrns. 301-795-7020
MA Norwood, Assocd. Power Prods. 617-769-7516
MS Jackson, Doby Assocs. 601-981-1138
MO St. Louis, Lowell Kangas 314-821-4050
NJ Dumont, John Hart 201-385-5595
NC Raleigh, Electronic Mktg. Assocs. 919-847-8800
NC Raleigh, Positive Comps. 919-772-8073
PA Newtown Sq., Willwam Reeves Assocs. 215-356-7500
TX Dallas, Power Connection 214-357-8207

Local Distributors
AK Anchorage, Revl 907-349-8790
CA Long Beach, Battery Specialties 800-352-3706
CA Mtn. View, Energy Sls. 415-969-0800
CA Redmond City, HDB Elctrns. 415-368-1388
CO Denver, Hensley Battery 303-455-3643
CT Waterbury, Lighting Svcs., Inc. 203-756-8148
FL Altamonte Springs, TNR Tech. 800-722-7267
FL Tampa, Specialty Distrbg. 813-870-3315
GA Norcross, Allied Elctrns. 800-433-5700
IA Cedar Rapids, Iowa Radio 319-393-4510
LA Lafayette, Ralph's Elctrns. 318-233-0105
LA New Orleans, Wm. B. Allen Supp. Co. 800-462-9528
MA Sharon, Adcour 617-784-3996
MA Wellesley Hills, Target Elctrns. 617-235-2545
MI Brighton, Applied Power 313-221-1331
MO Maryland Hgts., Chelsea Inds. 314-997-7709
NE Lincoln, Scott Elctrn. Supp. 402-466-0221
NJ Pinebrook, Ussco 201-882-8015
NY Ridgewood, J.A. McDermott Corp. 212-456-3606
OH Cleveland, Security Prods. Co. 216-451-1400
TX Austin, Galtronics 512-837-7470
TX Ft. Worth, Allied Elctrns. 800-433-5700
TX Texas city, Elctrn. Supp. 409-945-4401
VA Arlington, Arlington Elctrns. 703-524-2412
WA Redmond, Energy Sls. 206-883-2343

POWER SOURCES INTERNATIONAL INC., Sources Electronics, 3106 Sleepy Hollow Dr., Stockton, CA 95209, Tel: 209-476-8747, TWX: 510-600-5831, FAX: 209-476-8742

Power Star, Inc.

FAX: 714-261-5381

POWER STAR, INC., 17346 Eastman St., Irvine, CA 92714, Tel: 714-261-5377, 800-854-9420; Empl.: 15; *Sls. Mgr.:* Les O'Lennick ..... **D•2226-2227**

Local Sales Offices & Reps
OR Portland, Underwood & Hanify 503-224-0583
TX Dallas, Seaton Corp. 214-380-0414
WA Bellevue, Underwood & Hanify 206-643-1793

power SWITCH corp.

FAX: 201-641-7871

POWER SWITCH CORPORATION, 50 Graphic Place, Moonachie, NJ 07074, Tel: 201-641-4544; Empl.: 33; *Sls. Mgr.:* Danice Donito ..... **D•1998-2001**

Local Sales Offices & Reps
CA Santa Clara, SAE 408-988-0700
CA Westlake Vl., The Tricamo Co. 805-496-3177
CO Aurora, High Technlg. Assocs. 303-695-1990
FL Melbourne, VM2 Mktg. 305-984-1918
IL Berkeley, ESA Tech. Mktg. 312-544-0120
IN Indianapolis, STB & Assocs. 317-844-9227
MD Middletown, S.T./Woolard Co. 301-371-4500
MN Minneapolis, Electro-Serv 612-338-3475
MO Grandview, R. R. Burton Assocs. 816-763-5385
MO St. Louis, G.M. Brown & Assoc. 314-741-4424
NJ Franklin Lakes, Hansen & Hughes 201-848-8900
NY Cazenovia, S.T./Woolard Co. 315-655-8145
NY Greenlawn, Hansen & Hughes 516-754-3608
OH Cleveland, Bradcor Elctrns. 216-261-0888
OH Dayton, Bradcor Elctrns. 216-671-1200
PA Hatboro, Electro Rep Engrg. 215-674-4421

RI Providence, ISM 401-351-7348
SC Pickens, S.T./Woolard Co. 803-878-3830

POWER SYSTEMS, INC., 45 Griffin Rd., South, Bloomfield, CT 06002, Tel: 203-726-1300, TWX: 710-425-8778, FAX: 203-726-1495; FSC No.: 50463; Empl.: 250; *Sls. Mgr.:* Leon Gedacht ..... **D•2003**

Local Sales Offices & Reps
AZ Tempe, A5 Co. 602-968-4923
CA Los Gatos, Luscombe Engrg. of San Francisco 408-370-2020
CA Mission Viejo, The Powerhouse, Inc. .. 714-770-9009
CO Parker, A5 Co. 303-841-3651
CT Broadbrook, Comptech, Inc. 203-623-8014
AL Decatur, R. K. Welter & Assocs. 205-350-3441
FL Mt. Dora, R.K. Welter & Assocs., Inc. .. 904-357-3011
GA Dunwoody, R. K. Welter & Assocs., Inc. 404-390-9718
IL Rolling Meadows, Eagle Tech. Sls. 312-991-0700
MD Timonium, Bresson Assocs., Inc. 800-523-5512
MA Tyngsboro, Comptech, Inc. 508-649-3030
MN Ann Arbor, Augnat Assocs. 313-668-3134
MN Edina, Mel Foster Tech. Sls., Inc. 612-941-9790
NJ Franklin Lakes, Hansen & Hughes 201-848-8900
NY Mendon, Marchese, Marsey & Barden, Inc. 716-582-2240
NY N. Syracuse, Marchese, Marsey & Barden, Inc. 315-458-6920
OH Akron, Augnat Assocs. 216-273-1211
PA Narberth, Bresson Assocs., Inc. 215-664-6460
TX Houston, Barry Sls., Inc. 713-784-5860
TX Richardson, Barry Sls., Inc. 214-234-0255
UT Salt Lake City, A5 Co. 801-483-1034
VA Forrest, Bresson Assocs. 800-523-5512
WA Kirkland, Northwest Comps. Sls. 206-828-4838
Can Burnaby, BC, Davetek Mktg., Inc. 604-430-3680

POWER SYSTEMS & CONTROLS, INC., 3206 Lanvale Ave., Richmond, VA 23230, Tel: 804-355-2803, FAX: 804-358-0498; Empl.: 55

POWER SYS. GRP., Rantec Div., Emerson Elec. Co., 9401 Oso Ave., Chatsworth, CA 91311, Tel: 818-885-8223, TWX: 910-493-1247; FSC No.: 04971; Empl.: 265; *Sls. Mgr.:* Fred Silver

POWERTEC, INC.

FAX: 818-998-4225

POWERTEC POWER SUPPLIES,INC., Div.of Astec America, 20550 Nordhoff St., Chatsworth, CA 91311-6168, Tel: 818-882-0004, TELEX: 277483, TWX: 910-494-2092; Empl.: 349; *Sls. Mgr.:* Barry A. Chenes ..... **D•2004-2020**

POWERTECH, INC., 0-02 Fairlawn Ave., Fairlawn, NJ 07410, Tel: 201-791-5050, TELEX: 353970; FSC No.: 32953; Empl.: 49; *Sls. Mgr.:* Chris Marino

POWER TECHNOLOGY COMPONENTS, A Div. of Microsemi Corp., 23201 S. Normandie Ave., Torrance, CA 90501, Tel: 213-534-3737, FAX: 213-530-5609

POWER TECHNOLOGY, INC., P.O. Box 9769, Little Rock, AR 72219, Tel: 501-568-1995, TWX: 910-722-7313, FAX: 501-568-1994; Empl.: 85; *Sls. Mgr.:* John Webb

POWER TEN, INC., 486 Mercury Dr., Sunnyvale, CA 94086, Tel: 408-738-5959, FAX: 408-738-4326; FSC No.: 61987; *Sls. Mgr.:* Vince Mutascio ..... **D•2021**

Local Sales Offices & Reps
AL Huntsville, Reynolds & Assocs. 205-881-9362
AZ Phoenix, Jayson Co., Inc. 602-867-1964
CA Los Alamitos, Power Specialists 213-594-9418
CA San Diego, Power Specialists 619-726-4799
FL Melbourne, Reynolds & Assocs. 800-255-1965
GA Atlanta, Reynolds & Assocs. 404-934-8525
MA Acton, Framar 617-263-2285
NY Fairport, Hi-Tec Sls. 716-223-5922
NC Raleigh, Reynolds & Assocs. 919-872-6668
PA Glenside, Koebert 215-887-2310
TX Austin, Eberts Elctrns. Sls. 512-258-1067
TX Latexo, Eberts Elctrns. Sls. 409-687-4342
WA Bellevue, A. J. Smith Co. 206-746-6770
Can N. Vancouver, BC, Jerome & Francis 604-986-1286
Can Toronto, Duncan Instruments 416-742-4448

POWERTREND, INC., 1111 Rancho Conejo Blvd., Ste. 401, Newbury Pk, CA 91320-1415, Tel: 805-496-2945, FAX: 805-498-6880; *Sls. Mgr.:* R. Jones

POWERTRON, See Industrial Test Equipment Co., Inc., FAX: 516-883-7155

POWERTRON, Contraves Goerz Corp., 3821 Barranger Dr., Charlotte, NC 28210, Tel: 704-525-8962, TELEX: 572-444

POWERTRON CORP., Rte. 15, P.O. Box 932, Dept. E, Sparta, NJ 07871, Tel: 201-579-5599, TELEX: 136198; *Sls. Mgr.:* William E. Cannon; *Dist. Mgr.:* William E. Cannon ..... **D•2022**

POWR-UPS CORP., Brookhaven R&D Plaza, 1 Roned Rd., Shirley, NY 11967, Tel: 516-345-5700, 1-800-333-POWR; Empl.: 50; *Sls. Mgr.:* Darlene DiRosa ..... **B•1298-1299**

Local Sales Offices & Reps
CA Valencia, Blair Randle & Assoc. 805-259-3326
IL Oak Brook, A.G. Erickson 312-323-1367
IL Oak Brook, A.G. Erickson Assoc. 312-573-1367
MO St. Charles, Drives Plus, Inc. 314-441-7765
NJ Waldwick, Motors, Controls & Reducers Inc. 201-670-0270
OH Dover, AJ Assocs. 216-343-2224

Local Distributors
IN Ft. Wayne, PHC Inds., Inc. 219-423-9461
NY Long Island City, B & B Motor & Control Corp. 800-638-7808
NY Long Island City, B & B Motor Control Corp. 718-784-1313
OH Cincinnati, Cincinnati Belting & Transmission 513-621-9050
OH Copley, Ohio Brake & Clutch Corp. ... 216-666-4192

PPC PRODUCTS CORPORATION, 7516 Central Industrial Dr., Riviera Beach, FL 33404, Tel: 407-848-9606, TWX: 510-952-7611; FSC No.: 33178; Empl.: 100; *Sls. Mgr.:* Nick Ernick

PPD, INC., 6001 Resco Ct., Raleigh, NC 27613, Tel: 919-781-3955, FAX: 919-781-4980 ..... **A•1163-1169**

Local Sales Offices & Reps
NC Raleigh, Godwin Assocs. 919-878-8000

PPM, INC., 5385 Harper Rd., Cleveland, OH 44139, Tel: 216-349-2300, FAX: 216-349-2302; Empl.: 20; *Sls. Mgr.:* A. L. Bletcher ..... **D•1334**

Local Sales Offices & Reps
AL Huntsville, Jim Springer, Inc. 205-883-4163
AZ Phoenix, J. Smith & Assocs. 602-267-0981
CO Denver, J. Smith & Assocs. 303-597-5343
MI Ferndale, Tiby Co. 313-547-3550
NM Albuquerque, J. Smith & Assocs. 505-345-6501
OH Cleveland, Tiby Co. 216-371-5335
OH Dayton, Tiby Co. 513-277-3822

PRACTICAL AUTOMATION, INC., 2 Research Dr., Shelton, CT 06484, Tel: 203-929-5381, TELEX: 6813310, FAX: 203-929-9941; Empl.: 150; *Sls. Mgr.:* R. M. Banzaca

PRD ELCTRNS., DIV. OF HARRIS CORP., see Harris Corp., PRD Electronics Div.

precicontact, inc.

FAX: 215-757-8025

PRECICONTACT, INC., 835 Wheeler Way, Langhorne, PA 19047, Tel: 215-757-1202, TELEX: 37-29448; FSC No.: 60197; Empl.: 100; *Sls. Mgr.:* Stephen Lawler ..... **C•1510-1513, 1718**

Local Sales Offices & Reps
AL Huntsville, Electramark 205-830-4400
CA Chatsworth, First Rep 818-718-6155
CA San Diego, Qualtronics 619-695-0118
CA San Jose, Applied Elctrn. Mktg. 408-971-9377
CO Englewood, Megatronix 303-799-3700
GA Norcross, Electramark 404-446-7915
IL Schaumburg, Tech-Tron Sls. Inc. 312-843-7530
IN Greenwood, Valentine & Assocs. 317-888-2260
IN South Bend, Valentine & Assocs. 219-288-7070
IA West Des Moines, SPS Assocs. 515-225-0607
KS Olathe, SPS Assocs. 913-764-4460
MD Towson, Arbotek 301-825-0775
MA Norwood, The Mac Innis Co. 617-762-8090
MN Maple Grove, Design Technlg. 612-424-7605
MO Earth City, SPS Assocs. 314-291-0521
NE Panama, SPS Assocs. 402-477-7227
NJ Marlton, Naudain Assocs. 609-983-5300
NY Port Washington, Ashtec, Inc. 516-767-0336
NY Victor, Integrity Mktg. Co. 716-924-3671
OH Cincinnati, Makin & Assocs. 513-871-2424
OH Cleveland, Makin & Assocs. 216-248-7370
OH Columbus, Makin & Assocs. 614-848-5424
OK Tulsa, Component Technlg. 918-749-2107
OR Portland, Elctrn. Mktg. Grp. 503-684-5935
TX Austin, Component Technlg. 512-250-2450
TX Dallas, Components Technlg. 214-783-8831
TX Houston, Components Technlg. 713-961-1262
UT Salt Lake City, Charles Fields & Assocs. 801-531-6177
VA Harrisonburg, Blueridge Prods. 703-433-0990
WA Cattaroy, Electronic Mktg. Grp. 509-922-2718
WA Redmond, Electronic Mktg. Grp. 206-882-0962
WA Vancouver, Electronic Mktg. Grp. 206-254-4572
Can Burnaby, B.C., Vitel Elctrns. 604-439-1136
Can Markham, Ont., Avotronics 416-475-2024
Can Ontario, Avotronics 416-475-2024
Can Pointe Claire, Que., Avotronics 514-697-2135

Local Distributors
AZ Litchfield Park, GB Elctrns. 602-935-3984
AZ Phoenix, Future/Cetec 602-272-7951
AZ Tempe, Cypress Elctrns. 602-966-2256
CA Buena Pk., Cypress/RPS Elctrns. 213-744-0355
CA Chatsworth, Future/Cetec 818-700-0914
CA Irvine, Future/Cetec 714-250-4141
CA Orange, Electronic Connexions Corp. 714-998-2901
CA San Diego, Cypress/RPS Elctrns. 619-292-5611
CA San Diego, Future/Cetec 619-278-5020
CA San Jose, Cypress Elctrns. 408-945-8400
CA San Jose, Future Elctrns. 408-945-9100
CO Denver, CSID, Inc. 303-292-9594
CO Westminster, Future Elctrns. 303-650-0123
CO Wheatridge, Cypress Elctrns. 303-431-2622
CT Bethel, Future Elctrns. 203-743-9594
CT Bridgeport, Park Distrs. 203-366-8414
CT East Haven, J.V. Elctrns. 203-469-2321
CT Wallingford, Cronin Elctrns., Inc. 203-265-3134
CT Wallingford, Sager 203-265-4600
FL Altamonte Springs, Future Elctrns. 305-767-8414
FL Clearwater, Electronic Precepts of FL 813-530-9781
FL Clearwater, Future Elctrns. 813-441-4771
FL Orlando, Reptron Elctrns. 305-735-1112
FL Tampa, Reptron Elctrns. 813-854-2351
GA Atlanta, Reptron Elctrns. 404-446-1300
GA Atlanta, Future Elctrns. 404-441-7676
IL Crystal Lake, Subsem 815-459-4139
IL Lisle, Components, Inc. 312-852-7707
IL Palatine, OHM Elctrns., Inc. 312-359-5500
IL Schaumburg, Future Elctrns. 312-882-1255
IL Schaumburg, Reptron Elctrns. 312-882-1700
IN Indianapolis, Mar Elctrns. 317-875-4510
MD Baltimore, Source Comps. 301-335-7171
MD Columbia, Aztech Elctrns. 301-995-6800
MD Columbia, Future Elctrns. 301-995-1222
MA Andover, Aved Elctrns. 617-688-3800
MA Hingham, Sager 617-749-6700
MA Needham, Cronin Elctrns. 617-449-5000
MA Westborough, Future Elctrns. 617-366-2400
MA Wilmington, J.V. Elctrns. 617-273-4300
MI Detroit, Reptron Elctrns. 313-525-2700
MI Livonia, Future Elctrns. 313-261-5270
MN Eden Prairie, Future Elctrns. 612-944-2200
MN Minnetonka, Reptron Elctrns. 612-938-0000
MO Kansas City, Walters Elctrns. 816-531-7015
MO St. Charles, Finnegan Elctrns. 314-946-6201
NH Salem, Sager 603-898-1348
NJ Bellmawr, Mid-Atlantic Elctrns. 609-931-5303
NJ Berlin, GCI Corp. 609-768-6767
NJ Fairfield, Future Elctrns. 201-227-4346
NJ Mt. Laurel, Future Elctrns. 609-778-7600
NJ Parsippany, North American Sls. Co. .. 201-299-1123
NJ Springfield, Route Elctrns. 201-379-7710
NM Albuquerque, Bestech 505-298-0034
NM Albuquerque, Connecting Comps. Div. 505-345-8921
NY Brooklyn, Connector Resources 718-383-2208
NY Hauppauge, Future Elctrns. 516-234-4000
NY Hauppauge, Jaco Elctrns. 516-273-5500
NY Hauppauge, Sager 516-348-1300
NY Liverpool, Future Elctrns. 315-451-2371
NY Rochester, Future Elctrns. 716-272-1120
OH Dayton, Televox, Inc. 513-294-4499
OH Mansfield, Rush Elctrns. Distrs., Inc. ... 419-756-2322
OH Solon, Reptron Elctrns. 216-349-1415
OH Worthington, Reptron Elctrns., Inc. 614-436-6675
OR Beaverton, Component Resources 503-641-8488
OR Beaverton, Cypress Elctrns. 503-641-2233
OR Beaverton, Future Elctrns. 503-645-9454
PA Wayne, Peak Elctrns. 215-293-9000
PA York, E.C.I. 717-846-5334
RI Warwick, Cal-Greg Comps. 401-738-6170
TX Allen, Prime Distrbg. Co. 214-231-0170
TX Austin, Southwest Elctrns. 512-837-8971
TX Dallas, Cypress Elctrns. 214-869-1435

TX Richardson, Future Elctrns. 214-437-2437
TX Richardson, Jaco Elctrns. 214-235-9575
TX Richardson, Southwest Elctrns. 214-234-3050
TX Stafford, Southwest Elctrns. 713-491-4900
UT Salt Lake City, Future Elctrns. 801-972-8489
WA Bellevue, Future Elctrns. 206-881-8199
WA Bothell, Cypress Elctrns. 206-622-6833
WA Seattle, Pacific Elctrns. 206-575-1050
Can Calgary, Alb., Future Elctrns. 403-235-5325
Can Edmonton, Alb., Future Elctrns. 403-438-2858
Can Ottawa, Ont., Future Elctrns. 613-820-8313
Can Pointe Claire, Que., Future Elctrns. 514-694-7710
Can Toronto, Ont., Future Elctrns. 416-638-4771
Can Vancouver, B.C., Future Elctrns. 604-438-5545
Can Winnipeg, Manitoba, Future Elctrns. 204-339-0554

PRECI-DIP, See Mill-Max Mfg. Corp.

PRECISION COMPONENTS, INC., 1110 W. National Ave., Addison, IL 60101, Tel: 312-543-6400, FAX: 312-628-8788

PRECISION CONTROL MANUFACTURING, INC., 1509 B Queen Anne Ave. N., Seattle, WA 98109, Tel: 206-281-9380; FSC No.: 64782 ..... **A•2141**

Local Sales Offices & Reps
WA Seattle, Precision Control Mfg., Inc. 206-281-9380

Local Distributors
CA Granada Hills, Lion Elctrn., Inc. 818-363-0993

PRECISION DIGITAL CORP., 80 Coolidge Hill Rd., Watertown, MA 02172, Tel: 617-924-2256, FAX: 617-924-9219

PRECISION ELECTRONICS, 9101 King Ave., Franklin Park, IL 60131, Tel: 312-678-5350, FAX: 312-678-0511; Empl.: 25; *Sls. Mgr.:* William Stow

PRECISION EXTRUSIONS, INC., Box 120, Bensenville, IL 60106, Tel: 312-766-0340, FAX: 312-766-0495; Empl.: 185; *Sls. Mgr.:* Richard Ziehm

PFT INC. PRECISION FABRICATION TECHNOLOGIES, INC.

FAX: 219-253-6570

PRECISION FABRICATION TECHNOLOGIES, INC., State Road 16 W., Monon, IN 47959, Tel: 1-800-558-7297, 219-253-6666; Empl.: 62; *Sls. Mgr.:* Joseph Rogers; *Dist. Mgr.:* Duane Nagel ..... **C•1079-1083**

Local Sales Offices & Reps
CA Saratoga, Edward King & Assocs. 408-741-0434
CA Valencia, Lessing & Assocs. 805-295-0225
CT Old Saybrook, FJS Assocs. 203-388-5374
FL Tampa, SRT Mktg. 813-884-4805
IL Park Ridge, Bob Burns & Assocs. 312-823-9360
MA Burlington, FJS Assocs. 617-273-5959
NJ Medford, Champion Elctrn. Sls. 609-983-0932
NY Islandia, Schmitt Mktg. Corp. 516-582-5888
OH Dayton, Baehr, Greenleaf & Assocs. 513-439-0724
OH Westlake, Baehr, Greenleaf & Assocs. 216-892-1770
OH Worthington, Bachr, Greenleaf & Assoc. 614-847-0220
OR Portland, Caruso & Co. 503-620-0375
PA Warrensdale, Bachr, Greenleaf & Assoc. 412-934-3088
TX Dallas, S.W. Mktg. Assocs. 214-341-8631
TX Houston, S.W. Mktg. Assocs. 713-537-8166
WA Bellevue, Caruso & Co. 206-455-8811
WI Colgate, Rep One & Assocs. 414-628-4016

PRECISION FILTERS, INC.

FAX: 607-277-4466

PRECISION FILTERS, 240 Cherry St., Ithaca, NY 14850, Tel: 607-277-3550, TELEX: 646846; FSC No.: 66-II-F & 66-II-I; Empl.: 95; *Sls. Mgr.:* D. F. Chandler ..... **A•1682, 1716-1724; D•1017-1020**

Local Sales Offices & Reps
AL Huntsville, Burnette Techno-Metrics Inc. 205-830-2832
CA Laguna Hills, Elotek Sys., Inc. 714-830-4856
CA Pleasonton, SECCO Sales, INc. 415-484-1030
CO Broomfield, Hannah-Hill, Inc. 303-460-0602
AZ Phoenix, Western Region Sls. Off. 602-953-0345
DC Arlington, Gans & Pugh 703-527-3262
FL Osprey, Dick Ridgewell Co. 813-484-2020
LA New Orleans, Abcor, Inc. 504-833-5861
MD W. Friendship, Gans & Pugh Assocs. 301-442-2189
MA Beverly, Ellis Assocs. 617-922-2015
MO Manchester, Vertec Assocs., Inc. 314-394-6242
NM Albequerque, Hannah-Hill, Inc. 505-292-4098
NY Saugerties, Beckrep, Inc. 914-246-3031
PA North Wales, Gans & Pugh Associates, Inc. 214-699-6655
TX Houston, ABCOR, Inc. 713-486-9251
VA Arlington, Gans & Pugh Assocs. 703-527-3262
WA Bellevue, Topp Engrg. Sls. 206-747-5400
EXP Can./Ottawa, Ont., Rayonics Sci. 613-521-8251
Can Downsview, Ont., Rayonics Scientific 416-736-1600
Can St. Laurent, Que., Rayonics Sci. 514-335-0105

PRECISION GRAPHICS INC., 59 La Grange St., Raritan, NJ 08869, Tel: 201-707-8880, FAX: 201-707-8884; Empl.: 36; *Sls. Mgr.:* Robert T. Weissman

PRECISION INTERCONNECT, 16640 SW 72nd Ave., Portland, OR 97224, Tel: 503-620-9400, TELEX: 36-0963; FSC No.: 60381; Empl.: 260; *Sls. Mgr.:* Walt Harwood ..... **C•1917-1919**

Local Sales Offices & Reps
CA Hayward, Precision Interconnect 415-785-1277
DE Wilmington, Precision Interconnect 302-798-7071
NH Portsmouth, Precision Interconnect ... 603-433-5802
OR Portland, Precision Interconnect 503-620-9400

PRECISION LAMP, INC., 681 Portal St., Cotati, CA 94931, Tel: 707-792-0333, FAX: 707-792-2738; FSC No.: FSCM 58451; Empl.: 25

PRECISION MECHANISMS, 44 Brooklyn Ave., Westbury, NY 11590, Tel: 516-ED3-5955; FSC No.: 08127; Empl.: 26; *Sls. Mgr.:* Leon N. Canick

PRECISION METAL PRODUCTS CO., Centennial Indl. Pk., Peabody, MA 01961-6026, Tel: 508-532-5500, FAX: 508-532-9403; FSC No.: 86577; Empl.: 54; *Sls. Mgr.:* Robert H. Degnan

PRECISION MICROELECTRONICS, 1000 E. Campbell, Ste. 106, Richardson, TX 75081, Tel: 214-437-4141, FAX: 214-644-2771; Empl.: 350; *Sls. Mgr.:* C. G. Willis

PRECISION POWER SYSTEMS, 1840 Industrial Circle, Longmont, CO 80501, Tel: 303-443-6250, FAX: 303-678-8360; Empl.: 75; *Sls. Mgr.:* Linda Tholen

FAX: 319-394-9280

PRECISION RESISTIVE PRODUCTS, INC., P.O. Box 189, Highway 61 South, Mediapolis, IA 52637, Tel: 319-394-9131, TWX: 510-100-8039; Empl.: 65; *Sls. Mgr.:* Oscar Cline; *Dist. Mgr.:* Oscar Cline ..... **A•2032-2033**

Local Sales Offices & Reps
AL Huntsville, Hughes & Assocs. 205-533-9108
CA Anaheim, Impact Electrns. Inc. 714-533-1351
CA Los Altos, Frauman Assoc. 415-941-0660
CA San Diego, KCE 619-278-7640
CO Denver, Williams Assocs. 303-373-4730
IL Chicago, Ellinger Sls. 312-763-1570
IN Greenwood, Valentine Assocs. 317-888-2200
MA Waltham, Jesco, Inc. 617-893-0094
MI Warren, DEM Elctrns. Sls. 313-575-9444
MN Minneapolis, Intl. Sls. 617-831-8423
NJ Mountainside, Kevtron Elctrns. 201-654-7600
OH Cincinnati, G & H Sls. Co. 513-272-0580
TX Richardson, Campion Sls. Co. 214-238-8145
WA Seattle, W3 Assocs., Inc. 206-285-2667

PRC

FAX: 813-546-9515

PRECISION RESISTOR CO., INC., 10601 75 St. N., Largo, FL 34647, Tel: 813-541-5771, TELEX: 821788; FSC No.: 48615; Empl.: 45; *Sls. Mgr.:* Arleen Reid ..... **A•2034-2039**

PRECISION SPECIALTIES, INC., 19414 Londelius St., Northridge, CA 91324, Tel: 818-349-9774, FAX: 818-772-7577; FSC No.: 66785; Empl.: 5

PRECISION STANDARD TIME, INC., 105 Fourier Avenue, Fremont, CA 94539, Tel: 415-656-4447, FAX: 415-656-1671; *Sls. Mgr.:* Ken Brandt

PRECISION TECH. SEWING, 921 E. Charleston Rd., Palo Alto, CA 94303, Tel: 415-856-2128; FAX: 415-856-1638

PRECISION TUBE, Church Rd. & Wissahickon, N. Wales, PA 19454, Tel: 215-699-5801, FAX: 215-699-0761; FSC No.: 82413; Empl.: 240; *Sls. Mgr.:* William J. McNeil

PREFERRED ELECTRONICS, INC., Main Line Dr., P.O. Box 248, Westfield, MA 01086, Tel: 413-568-2301, TELEX: 955-329, FAX: 413-562-7275; Empl.: 175; *Sls. Mgr.:* John Vaughan

Preh

FAX: 312-438-5522

PREH ELECTRONIC INDUSTRIES, INC., 470 E. Main St., Lake Zurich, IL 60047-2578, Tel: 312-438-4000, TELEX: 297-112 PEI; FSC No.: 36-3193682; Empl.: 7; *Sls. Mgr.:* Ken Wood ..... **A•2142; B•1830, 1882; C•1514**

Local Sales Offices & Reps
AL Huntsville, Hughes Assocs. 205-533-9108
AZ Phoenix, More Sls., Inc. 602-788-9181
CA Carlsbad, Bart Budge Assocs. 619-471-2554
CA Mtn. View, Bart Budge Assocs. 415-961-0940
CO Arvada, Arrowhead CSI/ Sls. 303-423-5597
CO Littleton, Anodyne Tech. Sls. 303-979-2435
CT Cheshire, MacInnis 203-272-8877
FL Miami, Indl. Comps. 305-477-0387
GA Norcross, Hughes Assocs. 404-662-1587
IL Des Plaines, Essco Assocs. 312-298-5310
MD Columbia, L. D. Lowery, Inc. 301-381-0225
MA Norwood, MacInnis Co. 617-762-8090
MI Troy, C.B. Jensen & Assocs. 313-643-1652
MN Bloomington, Electronic Sls. Agy. 612-884-8291
MS Corinth, Hughes Assocs. 601-287-2915
MO St. Louis, Jim Amberg 314-946-5777
NJ Woodbridge, John Chirico Assocs. 201-855-9600
NC Cary, Hughes Assocs. 919-467-7029
OH Cincinnati, Bob Gilbert & Assocs. 513-574-1932
OR Portland, SPS Elctrns. 503-297-6919
PA Broomall, L.D. Lowery Inc. 215-356-5300
TN Jonesboro, Hughes Assocs. 615-753-2719
TX Round Rock, Encore Tech. Comps. ... 512-388-7930
UT Salt Lake City, Arrowhead CSI/Sls. ... 801-268-8440
WA Redmond, SPS Elctrns. 206-885-5257
Can Markham, Ont., Avotronics Ltd. 416-475-2024

Local Distributors
CA Belmont, LoDan Elctrns. Inc. 415-592-4600
CA Gardena, California Switch & Signal .. 213-770-2330
CO Arvada, Denver Beta Wintronic 303-431-7161
CT Norwalk, Cobra Comps. 203-847-6442
FL Largo, LoDan Elctrns., Inc. 813-586-2851
IL Arlington Hgts., LoDan Elctrns. 312-398-5311
IL Wheeling, Hawk Elctrns. 312-459-4030
MA Hingham, Sager Elctrl. Supp. Co. 617-749-6700
MA Hopedale, Teccon Elctrns. 617-478-8544
MA Westborough, In Stock Prods. Co. 617-870-5750
NJ Camden, Gen. Radio Supp. Co. 609-964-8560
NY Bohemia, Key Comps. 516-567-7500
NY Hauppauge, Broadline Elctrns. 516-231-4100
NY Hempstead, Elctrn. Equip. 516-538-5510
NY Rochester, Whirlwind Music Distrs. ... 716-663-8820
OH Akron, Aesco Elctrns. 216-762-8818
OR Beaverton, Component Resources 503-641-8488
PA Harrisburg, Cumberland Elctrns. 717-232-5999
TX Dallas, Off the Shelf Comps. 214-247-0052
WA Seattle, Radar Elec. 206-282-2511
Can London, Ont., C. M. Peterson Co. Ltd. 519-434-3204
Can Montreal, Que., Ferro Technique 514-341-3450
Can Scarborough, Ont., Carsten Elctrns. Ltd. 416-495-9999
Can Toronto, Ont., Atlas Elctrns. Ltd. 416-789-7761
Can Willowdale, Ont., Electrosonic Inc. 416-494-1666

PREMA PRECISION ELECTRONICS, INC., 6290 Sunset Blvd., Suite 1126, Los Angeles, CA 90028-8770, Tel: 213-463-2294, TWX: 910-321-2903, FAX: 213-463-4319

FAX: 212-993-9211

PREMIER METAL PRODS. CO., 381 Canal Pl, Bronx, NY 10451, Tel: 212-993-9200; Empl.: 75; *Sls. Mgr.:* Anthony E. Bozza ..... **C•1084-1085**

Local Sales Offices & Reps

AZ	Phoenix, Scientific Dvcs.	602-957-0401
CA	Fontana, Premier Metal	714-829-3089
CA	Huntington Bch., Scientific Dvcs.	714-840-3501
CA	San Jose, Scientific Dvcs.	408-554-0455
CO	Denver, AKI Enterprises	303-338-4488
CT	East Haven, Eagle Assocs.	203-467-6542
GA	Marietta, Adams & Assocs.	404-973-0853
IL	Elmhurst, Utronix Sls.	312-834-1100
KS	Kansas City, Delltron Co.	816-436-6445
MD	Burtonsville, Eastern Instrmn.	301-384-8500
MA	Needham, Eagle Assocs.	617-444-3446
MI	Brighton, Electronic Sources	313-227-3598
MN	Minneapolis, J.E.M. Anderson Co.	612-823-6459
MO	Florissant, Delltron Co.	314-839-0033
NM	Albuquerque, Scientific Dvcs.	505-293-3494
NY	New Hyde Park, Harris & Aldrich Sls.	516-488-2622
NY	Yonkers, Sonkin Assocs.	914-968-8282
NC	Greenboro, Adams & Assocs.	919-272-6838
PA	Penndel, Delta Mktg.	215-750-1440
TX	Euless, W. Pat Fralia Co. Inc.	817-354-9720
TX	Houston, W. Pat Fralia Co. Inc.	713-772-1572
WA	Redmond, Scientific Dvcs	206-885-0004
EXP	FL, Ft. Lauderdale, GM Intl.	305-434-6617

Local Distributors

AL	Binmingham, American Elctrn. Supp.	205-942-4656
AZ	Phoenix, Dalis Elctrns.	602-275-2885
CA	Burlingame, Rose Elctrns.	415-348-2740
CA	San Jose, Quement Elctrns.	408-998-5900
CT	Danbury, Pilgrim Elctrns.	203-792-7274
CT	Wallingford, Sager Elctrl. Supp.	203-265-4600
IL	Elk Grove Village, GBL/Gould Elctrns.	312-593-3220
LA	Baton Rouge, Menard Elctrns.	504-355-0323
MD	Baltimore, Resco	301-823-0070
MD	Bethesda, Empire Elctrns.	301-656-3300
MA	Hingham, Sager Electrical Supp.	617-749-6700
MI	Ann Arbor, Purchase Radio Supp.	313-668-8696
MO	St. Louis, Gateway Elctrn. Supp.	314-427-6116
NJ	Cranford, Garden State Indl. Elec.	201-272-6400
NJ	Hanover, State Elctrns. PTS	201-887-2550
NY	Buffalo, Summit Distrs.	716-884-3450
NY	Hauppauge, Broadline Elec. Dist.	516-231-4100
NY	Hempstead, Davis Elctrn. Corp.	516-483-9200
NY	LIC, H. L. Dalis Inc.	212-361-1100
NY	New York, Martin Audio/Video Corp.	212-541-5900
NY	Portchester, Wise Comps.	914-939-8600
NY	Rochester, Simcona Elctrn. Corp.	716-328-3230
NY	Rochester, Summit Elctrns.	716-334-8110
NC	Raleigh, Southeastern Radio	919-828-2311
OH	Warren, Rem Elctrns.	216-248-1636
PA	Allentown, Federated Elctrns.	215-437-4481
PA	Horsham, Toner Cable Equip.	215-675-2053
PA	West Chester, West Chester Elec. Supp.	215-696-7500
SC	Charleston, Wholesale Indl. Elec.	803-722-2634
TN	Clarksville, Randolph Hale & Matthews	615-647-2325
TN	Cookeville, Randolph & Parks	615-526-6184
TN	Nashville, Randolph & Rice	615-255-5601
TN	Tullahoma, Randolph Rice & Williams	615-455-4531
TX	Ft. Worth, Swieco Inc.	817-335-6521
TX	Houston, Lenert Co.	713-225-1465
VA	Arlington, Arlington Elctrns.	703-524-2412
WA	Seattle, Radar Elec. Co.	206-282-2511

PREMIER MICROWAVE, 35 New Broad St., Port Chester, NY 10573, Tel: 914-939-8900, TWX: 710-569-1609, FAX: 914-939-9239; FSC No.: 15870; Empl.: 90; *Sls. Mgr.:* Mel Radner

PREM

FAX: 815-385-8578

PREM MAGNETICS, INC., 3521 N. Chapel Hill Rd., McHenry, IL 60050, Tel: 815-385-2700; FSC No.: 20462; Empl.: 150; *Sls. Mgr.:* D. Hertel ..... **A•1288-1291, 2422-2433**

PRES-AIR-TROL CORP., 1009 Boston Post Rd., Mamaroneck, NY 10543, Tel: 914-698-2026, 800-431-2625 (outside NY), FAX: 914-698-9456 ..... **B•1831**

PRESIDIO COMPONENTS, INC., 7185 Construction Ct., San Diego, CA 92121, Tel: 619-578-9390, TWX: 310-371-6407; FSC No.: 60212

PRESS-ON PRODUCTS, 21 Factory Rd., Addison, IL 60101, Tel: 312-628-2255, FAX: 312-543-4414; Empl.: 20; *Sls. Mgr.:* T. Cummins

PRESSURE CONTROLS, INC., 406 Cortlandt St., Belleville, NJ 07109, Tel: 201-751-5002, TWX: 510-600-6973; FSC No.: 52193; Empl.: 15; *Sls. Mgr.:* P. Emmarco

PRESSURE SYSTEMS, INC., 34 Research Dr., Hampton, VA 23666, Tel: 804-865-1243, TELEX: 901406, FAX: 804-766-2644; Empl.: 88; *Sls. Mgr.:* J. S. Yakshe

PRESTON SCIENTIFIC, 805 E. Cerritos Ave., Anaheim, CA 92805, Tel: 714-776-6400, TELEX: 5101004596 ESL UD, FAX: 714-776-3660; Empl.: 60; *Sls. Mgr.:* Charles J. McGuire

PRIMELINE, Soltec Corporation, P. O. Box 670, San Fernando, CA 91341-0670, Tel: 818-365-0101, TELEX: 494-3094 SOLTEC UI, FAX: 818-365-7839; *Sls. Mgr.:* Byron McIntire

PRIME POWER, A Prime Technology Co., Twin Lakes Rd., P.O. Box 185, N. Branford, CT 06471, Tel: 203-481-5721, TWX: 710-452-3092, FAX: 203-481-8937; *Sls. Mgr.:* J. L. Jamieson

PRIME TECHNOLOGY, INC., See General Resistance, A Prime Technology Co.

PRIMO COMPANY LIMITED, 25-1, 6-Chome, Mure, Mitakashi, Tokyo, Japan 181, Tel: 0422-43-3121, TELEX: 2822-326; FSC No.: 0422 49 8865; Empl.: 391; *Sls. Mgr.:* K. Shinai; *Dist. Mgr.:* S. Mizutani

PRINCETON CASE CO., INC., 667 Lehigh Ave., Union, NJ 07083, Tel: 201-687-1750, FAX: 201-687-1755; Empl.: 60; *Sls. Mgr.:* S. E. Parker

PRINCETON ELECTRONIC PRODUCTS, Box 101, North Brunswick, NJ 08902, Tel: 201-297-4448, FAX: 201-821-5950; Empl.: 29; *Sls. Mgr.:* H. Center; *Dist. Mgr.:* H. Center

PRINCO INSTRUMENTS, INC., 1020 Industrial Hwy., Southampton, PA 18966; FSC No.: 48620; Empl.: 70; *Sls. Mgr.:* G. G. Pfaff

Printer Products

FAX: 617-254-6848

PRINTER PRODUCTS, 25 Denby Road, Boston, MA 02134, Tel: 617-254-1200, TELEX: 951589; Empl.: 200; *Sls. Mgr.:* Blaine Wotring; *Dist. Mgr.:* Blaine Wotring ..... **D•1108-1109**

Local Sales Offices & Reps

CA	Anaheim, Paul Porter Printer Prods.	714-774-8650
MA	Boston, Richard Anger Printer Prods.	617-254-1200
Can	Markham,Ont., Technical Logistics Support	416-479-1911

PROBE MASTER, INC., 4898 Ronson Ct., San Diego, CA 92111, Tel: 619-560-9676, 800-854-1519, 800-772-1519, FAX: 619-560-7354; *Sls. Mgr.:* Dick Press

PROBE-RITE, INC., P.O. Box 242, Santa Clara, CA 95052, Tel: 408-727-0100, TWX: 910-338-0260; *Sls. Mgr.:* Frank J. Ardezzone

PRODELIN CORPORATION, P.O. Box 368, Conover, NC 28613, Tel: 704-464-4141, FAX: 704-464-5725; Empl.: 100; *Sls. Mgr.:* Dan Johnson

PRODUCTION AUTOMATION, INC., 3160 De la Cruz Blvd., Santa Clara, CA 95054, Tel: 408-980-9880, FAX: 408-980-8018; Empl.: 4; *Sls. Mgr.:* Bill Minnick; *Dist. Mgr.:* Bill Minnick

PRODUCTS ENGRG. CORP., 503 S. Vincent Ave., Azusa, CA 91702, Tel: 818-969-5879, TELEX: 910-587-1559, FAX: 818-969-9381; FSC No.: CAGE 3S621; Empl.: 50; *Sls. Mgr.:* Richard Mitchell

PRODUCTS FOR RESEARCH, 88 Holten St., Danvers, MA 01923, Tel: 508-774-3250, TELEX: 940-287, FAX: 617-245-1628; Empl.: 22; *Sls. Mgr.:* Skip Moccia

PTI PRODUCT TECHNOLOGY INC.

FAX: 714-474-1340

PRODUCT TECHNOLOGY, INC., 2811-B McGaw Avenue, Irvine, CA 92714, Tel: 714-474-8998; FSC No.: 1Z295; Empl.: 35 ..... **C•1719**

Local Sales Offices & Reps

CO	Broomfield, Ramark Sls.	303-469-1758

PROF. A/V & SPECIALTY PROD. DIV., 223-5N-01, St. Paul, MN 55144-1000, Tel: 612-733-1110, TWX: 910-563-3712, FAX: 612-736-1246; Empl.: 38,351

PROGRAMMABLE DEVICES, INC., 155-T New Boston St., Woburn, MA 01801, Tel: 617-935-9530, FAX: 617-935-3654; Empl.: 10

PTS FREQUENCY SYNTHESIZERS

FAX: 508-486-4495

PROGRAMMED TEST SOURCES, Beaver Brook Rd., P.O. Box 517, Littleton, MA 01460, Tel: 508-486-3008; FSC No.: 66381; Empl.: 30 ..... **D•1335**

PROJECTS UNLIMITED, 3680 Wyse Rd., Dayton, OH 45414, Tel: 513-890-1918, TWX: 810-450-2523, FAX: 513-890-4911; Empl.: 90; *Sls. Mgr.:* Greg Kimpton

PRO-LOG, 2560 Garden Rd., Monterey, CA 93940, Tel: 408-372-4593, TWX: 910-360-7082; Empl.: 120

PROTO STAMPING CORP., 811 Kaynyne St., Redwood City, CA 94063, Tel: 415-365-0498, TELEX: 709241, FAX: 415-366-6329; Empl.: 35; *Sls. Mgr.:* John Bristow

PROTOTEK, INC., 25 Standen Dr., Hamilton, OH 45015, Tel: 513-874-5094, FAX: 513-874-2252; FSC No.: 60813; Empl.: 45; *Sls. Mgr.:* Robert A. Shaver; *Dist. Mgr.:* Earl Rohe

PSG INDS., 1225 Tunnel Road, Perkasie, PA 18944, Tel: 215-257-3621, TELEX: 827361; FSC No.: 18509; Empl.: 150; *Sls. Mgr.:* Robert Banion

PTC INDUSTRIES, INC., 5721 Research Drive, Huntington Beach, CA 92649, Tel: 213-598-9547, 714-891-7561, FAX: 714-373-0269; Empl.: 14; *Sls. Mgr.:* Steve Varonka

PTC TRANSFORMERS, P.O. Box 397, Rising Sun Road, Bordentown, NJ 08505, Tel: 609-298-8200, TELEX: 510-685-3645; Empl.: 25; *Sls. Mgr.:* C. W. Harrison

PTS CORPORATION, Box 272, Bloomington, IN 47401, Tel: 812-824-9331; Empl.: 350; *Sls. Mgr.:* Jeff Hamilton; *Dist. Mgr.:* David Melwid

PTX-PENTRONIX INC., 1737 Cicotte, Lincoln Park, MI 48146, Tel: 313-388-3100, TELEX: 23-0398, FAX: 313-388-9171; Empl.: 21; *Sls. Mgr.:* J. Schultz

Z-LINE®

FAX: 714-641-9062

PULIZZI ENGINEERING, INC., 3260 S. Susan St., Santa Ana, CA 92704-6865, Tel: 714-540-4229; FSC No.: 70513; Empl.: 35; *Sls. Mgr.:* Michael B. Pulizzi; *Dist. Mgr.:* Michael B. Pulizzi ..... **D•2228-2231**

Local Sales Offices & Reps

CA	Los Angeles, Power Partners	213-215-0800
CA	Los Gatos, Norwest Elctrns.	408-395-1190
GA	Roswell, Acurep Assocs.	404-998-5008
MD	Silver Spring, L. G. White & Co., Inc.	301-792-0660
MA	N. Reading, Tech. Instrs., Inc.	508-640-0795
MI	Farmington Hills, E.M.A.	313-553-3377
NE	Omaha, Ioneb	402-895-0488
NY	Bay Shore, CPS-NY	516-665-7758
WI	Genoa City, Vine Technical	414-279-3871

Local Distributors

CA	San Jose, Dansco Comp. Sls., Inc.	408-292-9740
MA	Sharon, Adcour	617-784-8123

PULNIX AMERICA, INC., 770 Lucerne Dr., Sunnyvale, CA 94086, Tel: 408-733-1560, TELEX: 172541 PULNIX AMERICA, FAX: 408-737-2966; *Sls. Mgr.:* Richard Hofmeister

PULSE INSTRUMENTS CO., 1234 Francisco, Torrance, CA 90502, Tel: 213-515-5330; Empl.: 30; *Sls. Mgr.:* Ron Perry

PULSE TRONIC INC., P.O. Box 5196, Ville St. Laurnet, Que., Canada H4L 4Z8, Tel: 514-747-6028, TELEX: 05-826652, FAX: 514-747-7330; *Sls. Mgr.:* Pamela Hirsh

PURE DATA LTD., 180 West Beaver Creek Rd., Richmond Hill, Ont., Canada L4B 1B4, Tel: 416-731-6444, FAX: 416-731-7017; Empl.: 75; *Sls. Mgr.:* Terrence Hickey, Cdn. Sls.; *Dist. Mgr.:* Byron Kirkwood, US Sls.

PYLE INDUSTRIES, INC., 501 Center St., P.O. Box 620, Huntington, IN 46750, Tel: 219-356-1200, FAX: 219-356-2830; Empl.: 325; *Sls. Mgr.:* Frank Pyle, Jr.; *Dist. Mgr.:* Mark Pyle

PYLE-NATIONAL DIVISION, BRIntec Corp., 1334 N. Kostner Ave., Chicago, IL 60651, Tel: 312-342-6300, TELEX: 25251, TWX: 910-221-0335; FSC No.: 49367; Empl.: 650; *Sls. Mgr.:* Mike Carroccia; *Dist. Mgr.:* Mike Curroccia

PYLON CO., See Augat/Pylon Corp., Inc.

PYLON ELEX DEVELOPMENT CO. LTD., 2300 Victoria, Lachine, PQ, Canada H8S 1Z3, Tel: 514-637-1186, TELEX: 05-821680, FAX: 514-636-1970; Empl.: 50; *Sls. Mgr.:* Sydney Harland

PYROCOM CO., 924 N. 143rd St., Seattle, WA 98133, Tel: 206-365-3535; *Sls. Mgr.:* Bill Kurtz

PYROFERRIC INTERNATIONAL, INC., 200 Madison St., Toledo, IL 62468, Tel: 217-849-3300, TWX: 910-663-0616, FAX: 217-849-2544; Empl.: 50; *Sls. Mgr.:* S. John Horner

PYROFILM RESISTOR CO., See KDI Electronics

PYROHM, INC., 24268 Indoplex Circle, Farmington Hills, MI 48018, Tel: 313-478-5060; *Sls. Mgr.:* Charles R. Berry

Q-CARD, INC., 2 Chellis Ct., Owings Mills, MD 21117-1634, Tel: 301-581-0112

QSI CORPORATION, 1740 Research Pkwy., Logan, UT 84321, Tel: 801-753-3657, FAX: 801-753-3822; Empl.: 10; *Sls. Mgr.:* Dennis R. Durfee

Q-TECH CORP., 10150 W. Jefferson Blvd., Culver City, CA 90232-3510, Tel: 213-836-7900, TELEX: 69-6140, FAX: 213-836-2157; FSC No.: 51774; Empl.: 125; *Sls. Mgr.:* Sandra Rappaport ..... **A•1468-1470**

Local Sales Offices & Reps

CA	Northridge, Tauber-Dreyer	818-993-0048
CA	San Jose, Blue Elctrn. Sls.	408-248-4399
CO	Parker, Howard Assoc.	303-841-5755
IL	Northbrook, Allied Comp. Reps., Inc.	312-498-6658
IN	Fort Wayne, TX Sales Indiana	219-489-4447
MA	Malden, J-K Assocs.	617-321-2922
MO	St. Louis, Abrams & Assoc.	314-569-0447
NJ	Glen Gardner, F & M Tech. Sls.	201-832-7216
NJ	Paramus, Eltech Sls.	201-967-1309
TX	Austin, Texoma Technical Sales, Inc.	512-459-0802
TX	Houston, Texoma Technical Sales, Inc.	713-462-1432
Can	Ont./Don Mills, C.R. Snelgrove Co.	416-447-8531

QUALCOMM, INC., 10555 Sorrento Valley Rd., San Diego, CA 92130, Tel: 619-587-1121, FAX: 619-452-9096; Empl.: 300; *Sls. Mgr.:* Ellie Glaser; *Dist. Mgr.:* Ellie Glaser

Qualidyne

FAX: 619-429-1011

QUALIDYNE SYSTEMS, Unitech Ltd., 3055 Del Sol Blvd., San Diego, CA 92154, Tel: 619-575-4000, 800-445-0425, TELEX: 709029ò; Empl.: 300; *Sls. Mgr.:* James J. Louden ..... **D•2023-2032**

Local Sales Offices & Reps

AL	Huntsville, Beacon Elctrns.	205-881-5031
AZ	Phoenix, Thor Engrg.	602-438-8494
CA	Laguna Hills, Electroventure	714-581-9244
CA	San Diego, Digitrust	714-498-2777
CA	Santa Clara, Gagner-Toomey Assocs.	408-244-2200
CO	Westminster, Gemini	303-428-5600
FL	Boca Raton, Beacon Elctrns.	305-997-5740
GA	Atlanta, Beacon Elctrns.	404-256-9640
ID	Boise, J.J. Backer Co.	208-344-9588
IL	Northbrook, Howard Benjamin & Assocs.	312-272-9200
KS	Lenexa, Midtec	913-541-0505
MD	Gaithersburg, Deltatronics Inc.	301-253-0615
MA	Canton, Northern Computer Sls.	617-821-2180
MN	Burnsville, QualiDyne	800-445-0425
MO	St. Louis, Midtec	314-275-8666
NJ	Madison, Livera-Polk	201-377-3220
NY	Glen Head, Livera-Polk	516-759-9300
NY	Rochester, Elcom Sls., Inc.	716-385-1400
NY	Syracuse, Elcom Sls., Inc.	315-685-8245
NC	Raleigh, Beacon Elctrns.	919-787-0330
OH	Medina, Rockford Controls	216-725-3705
OR	Beaverton, J.J. Backer Co.	503-627-0775
PA	Chestnut Hill, Deltatronics, Inc.	215-248-0294
TX	Richardson, Spectra Sls. Corp.	214-234-3600
UT	Murray, Butterworth	801-268-2244
VA	Powhatan, Deltatronics	804-492-9027
WA	Seattle, J.J. Backer Co.	206-285-1300
Can	Toronto, Norgay Entprs. Ltd.	416-259-9663

QUALITEC TECHNOLOGIES, INC., 2251 E. Euclid Ave., Palo Alto, CA 94303-1706, Tel: 408-984-1763; Empl.: 30; *Sls. Mgr.:* Kevin Daniels ..... **D•1336**

QUALITY POWER SYSTEMS, INC., 2400 S. Texas Ave., Pearland, TX 77581, Tel: 713-997-1700, 800-992-1701, FAX: 713-997-1907; Empl.: 20; *Sls. Mgr.:* Clarence Oliver; *Dist. Mgr.:* Clarence Oliver

QUALITY TECHNOLOGIES, 3400 Hillview Ave., Palo Alto, CA 93404, Tel: 415-493-0400, FAX: 415-493-7055; Empl.: 2000; *Sls. Mgr.:* Bob Taber; *Dist. Mgr.:* Candace Johnson

Qti
Quality Thermistor, Inc.

FAX: 208-376-4754

QUALITY THERMISTOR, 2147 Centurion Pl., Boise, ID 83709, Tel: 208-377-3373; FSC No.: 56866; Empl.: 45; *Sls. Mgr.:* John Mahoney ..... **A•2198-2199; B•1914-1915**

QUALTEK ELECTRONICS CORP., 7158 Industrial Pk. Blvd., Mentor, OH 44060, Tel: 216-951-3300, TELEX: 985319, FAX: 216-951-7252; Empl.: 75; *Dist. Mgr.:* James Bof

QUAM-NICHOLS CO., 234 E. Marquette Rd., Chicago, IL 60637, Tel: 312-488-5800, FAX: 312-488-6944; Empl.: 200; *Sls. Mgr.:* William G. Little; *Dist. Mgr.:* Greg Johns ..... **D•1050-1051**

Local Sales Offices & Reps

AZ	Mesa, Yocum Mktg.	602-834-3334
CA	Belmont, Brian Trankle & Assocs.	415-595-4004
CA	Gardena, Bidwell-Schwartz Assocs.	213-770-0300
CO	Littleton, K. C. Martketers, Inc.	303-972-8411
FL	Orlando, Cartwright & Bean of FL	407-422-4531
GA	Norcross, Cartwright & Bean of GA	404-368-0160
IL	Elk Grove Village, Levy, Grams, & Lassers	312-364-7800
IL	Mt Prospect, The Dombrow Co.	312-253-3326
IN	Carmel, Green-Wissler Sls.,Inc.	317-843-5785
KS	Prairie Village, R. W. Kunz & Assocs., Inc.	913-648-3535
MA	Chicopee, Repworks, Inc.	413-533-0845
MN	Edina, Mel Foster Techn. Sls. Inv.	612-941-9790
NJ	Rahway, R. E. Breuer CO.	201-388-5045
NY	Rockville Centre, R & Sls.	516-678-6887
NY	Syracruse, The Lewis & Dunnigan Co., Inc.	315-446-5522
OH	Stow, J. W. Lehner Co.	216-686-1965
PA	Broomall, Lowery Assocs. Co.	215-356-5300
TN	Menphis, Cartwright & Bean of TN	901-362-8345
TX	Dallas, J. Y. Schoonmaker CO., Inc.	214-349-4650
WA	Seattle, Vector Manufacturers' Rep.	206-322-4343
EXP	Yonkers, NY, Robum Agencies, Inc.	914-968-1016
Can	Waterloo, Ont., McBride Loudspeaker Source, Ltd.	519-884-3500
MI	Southfield, Robert Miisk Co.	313-354-3310

QUAN-TECH, Stansbury Industries Inc., P.O. Box 28, Rte. 206, Flanders, NJ 07836, Tel: 201-927-1766, TWX: 710-987-7500; FSC No.: 63921; *Sls. Mgr.:* Helen A. Kronen

QUANTRONIX, 49 Wireless Blvd., P.O. Box 9014, Smithtown, NY 11788, Tel: 516-273-6900, TELEX: 685-2167, FAX: 516-273-6958; Empl.: 175; *Sls. Mgr.:* R. J. Bruno; *Dist. Mgr.:* R. J. Bruno

QUANTUM DATA®

FAX: 312-888-2802

QUANTUM DATA, INC., 2111 Big Timber Road, Elgin, IL 60123, Tel: 312-888-0450, TELEX: 206725; Empl.: 30 ..... **D•1337**

QUANTUM ELECTRONICS, INC., 31 Industrial Park Rd., Lewistown, PA 17044, Tel: 717-242-1132, FAX: 717-248-8680; Empl.: 70; *Sls. Mgr.:* Kit C. Kennedy

QUARTZITE PROCESSING, INC., 6 Holyoke St., Malden, MA 02148, Tel: 617-322-3611, FAX: 617-322-9623; Empl.: 11; *Sls. Mgr.:* P. S. Yanofsky

QUA TECH, INC., 478 East Exchange St., Akron, OH 44304, Tel: 216-434-3154, ESYLNK: 5101012726, FAX: 216-434-1409; Empl.: 25; *Dist. Mgr.:* Michael Armstrong

Q.V.S., INC., 20 North 15th St., East Orange, NJ 07017, Tel: 201-673-3996; FSC No.: 89820; Empl.: 45

QWINT DATA, INC., 3455 Commercial Ave., Northbrook, IL 60062, Tel: 312-564-0910, TELEX: 27-0498, FAX: 312-564-4714; Empl.: 105; *Sls. Mgr.:* K. S. Berland; *Dist. Mgr.:* Pat Donoso

RACAL-DANA INSTRS. INC., 4 Goodyear St., Irvine, CA 92718, Tel: 714-859-8999; FSC No.: 21793; Empl.: 230

RACAL-MILGO, 1601 N. Harrison Parkway, Sunrise, FL 33323-2899, Tel: 305-475-1601, 800-327-4440, TWX: 510-955-4145; Empl.: 2050; *Sls. Mgr.:* H. Cheli

RACET COMPUTES, LTD., 3150 E. Birch St., Brea, CA 92621, Tel: 714-579-1725, TELEX: 701160, TWX: RACET UD, FAX: 714-579-3183; Empl.: 25; *Sls. Mgr.:* Timothy Mahoney

RADIAL CONTROLS, 2555 E. 55th Place, Indianapolis, IN 46220, Tel: 317-255-2796; Empl.: 25; *Sls. Mgr.:* R. L. Newsom

RADIALL, INC., 150 Long Beach Blvd., Stratford, CT 06497, Tel: 203-386-1030, TELEX: 311796, FAX: 203-375-3808; Empl.: 22; *Sls. Mgr.:* Peter Dionisio; *Dist. Mgr.:* Nancy Thornton

RADIO MATERIALS CORP., P. O. Box 339, Attica, IN 47918, Tel: 317-762-2491, 1-800-356-9956, FAX: 317-762-6814; Empl.: 140; *Sls. Mgr.:* James Vogt; *Dist. Mgr.:* James Vogt

RADIOMETRICS, INC., 12021 South Memorial Pkwy., Huntsville, AL 35803, Tel: 205-881-1272; FSC No.: 62951; *Sls. Mgr.:* W. Shelton Ray

RADIOMETRICS MIDWEST CORP., 2200 S. Main St., Lombard, IL 60148, Tel: 312-932-7262; FSC No.: Cage Code 1Z075 SIC Code 8748 Ext. 0021; Empl.: 5

RADIO RESEARCH INSTRUMENT CO., INC., 584 North Main Street, Waterbury, CT 06704-3506, Tel: 203-753-5840, TELEX: 962444 RADAR DURY, FAX: 203-754-2567; FSC No.: 57174; *Sls. Mgr.:* E. B. Doyle

RADIO SWITCH CORP., 64 S. Main St., P.O. Box A, Marlboro, NJ 07746, Tel: 201-462-6100, FAX: 201-409-6695; FSC No.: 74217; Empl.: 40; *Sls. Mgr.:* J. L. Bernard

RADIO TELEVISION PRODUCTS CORP., 2702 Washington Ave. N., Douglas, AZ 85607, Tel: 602-364-4438, FAX: 602-364-4430; Empl.: 120; *Sls. Mgr.:* W. J. McGaw

RADIX WIRE CO., 26260 Lakeland Blvd., Cleveland, OH 44132, Tel: 216-731-9191, FAX: 216-731-7082; Empl.: 90; *Sls. Mgr.:* Peter B. Thurstone, Mktg. Admin.; *Dist. Mgr.:* Peter B. Thurstone, Mktg. Admin.

RADSTONE TECHNOLOGY, 20 Craig Rd., Montvale, NJ 07645, Tel: 201-391-2700, 800-368-2738, FAX: 201-391-2899; *Sls. Mgr.:* Larry Abzug

RAF ELECTRONIC HARDWARE, 95 Silvermine Rd., Seymour, CT 06483, Tel: 203-888-2133, TWX: 710-472-6216, FAX: 203-888-9860; FSC No.: 55566; Empl.: 120; *Sls. Mgr.:* William R. Bailey, Jr.; *Dist. Mgr.:* Dave Granger/John Capece

Distributor

RAG ELECTRONICS, INC., 21418 Parthenia St., Canoga Park, CA 91304, Tel: 818-998-6500, 800-732-3457
..... 623, 631, 689, 702, 705, 728, 732, 773, 794, 807, 809, 811

RAGEN CORP., Systems Div., 9 Porete Ave., N. Arlington, NJ 07032, Tel: 201-997-1000, FAX: 201-997-6948; Empl.: 400; *Sls. Mgr.:* Robert Hurley

RAGEN DATA SYSTEMS, INC., 3 Oval Dr., Central Islip, NY 11722, Tel: 516-234-3800, TELEX: 685-2305, TWX: 510-227-4901; FSC No.: 13068; Empl.: 177; *Sls. Mgr.:* Kevin Douglas

RALTRON ELECTRONICS, 2315 N.W. 107th Ave., Miami, FL 33172, Tel: 305-593-6033, TELEX: 441588, FAX: 305-594-3973; Empl.: 12; *Sls. Mgr.:* Alexander Wolloch; *Dist. Mgr.:* Ramon Quinones ..... **A•1471, 2041**

Local Sales Offices & Reps

AL	Huntsville, J.R. Assocs.	205-850-2130
AZ	Tempe, ACS of Arizona	602-829-7370
CA	Los Angeles, Mission Ridge Mktg.	714-253-4626
CA	San Diego, Scott Gould Co.	619-755-0824
CA	Santa Clara, Cummings & Assoc. N.	408-247-8656
CO	Denver, Summitwest Mktg.	303-460-9600
CT	Guilford, Data Mark	203-453-0575
FL	Boca Raton, Sales Specialists	305-391-3718
GA	Atlanta, J.R. Assocs.	404-922-1231
IL	Chicago, Gaertner & Assocs.	312-593-2332
MA	Boston, KSA of New England	508-443-5881
IN	Indianapolis, Bell Inds.	317-299-5487
MA	Boston, KSA of New England	617-443-5881
MI	Detroit, Elcon Michigan Sls.	313-855-3240
MN	Minneapolis, Hanna-Lind	612-925-5700
NJ	Teaneck, Strategic Sls.	201-833-0099
NC	Winston Salem, J.R. Assocs.	919-919-9574
OK	Tulsa, Advanced Tech. Sls.	918-664-0482
OR	Portland, Quest Mktg.	503-641-7377
PA	Horsham, Nexus Technlg. Sls.	215-675-9600
TN	Chattanooga, J.R. Assocs.	615-892-7630
TX	Austin, Advanced Tech. Sls.	512-331-9979
TX	Dallas, Advanced Tech. Sls.	214-340-1300
UT	Salt Lake City, Component Well	801-263-8131
WA	Seattle, Quest Mktg.	206-747-9424
Can	Montreal, Vitel Elctrns.	514-633-5951

Local Distributors

AL	Huntsville, Bell Inds.	205-837-1074
AZ	Phoenix, Bell Inds.	602-966-7800
CA	Canoga Pk., C & A Corp.	818-340-6035
CA	Sunnyvale, Bell Inds.	408-734-8570
CO	Denver, Indl. Elctrns.	303-694-9444
CT	E. Haven, J. V. Elctrn.	203-469-2321
CT	Stratford, Utronics	203-378-4201
FL	Ft. Lauderdale, N.R.C.	305-949-2400
GA	Norcross, Bell Inds.	404-662-0923
IL	Northbrook, Classic Comps.	312-272-9650
IA	Cedar Rapids, Bergquist Co.	319-366-8733
MD	Gaithersburg, Axis Elctrns.	301-840-9640
MA	Burlington, TLC Components	617-273-0140
MA	Needham, Cronin Elctrns.	617-449-5000
MI	Ann Harbor, Bell Inds.	313-971-9093
MN	Minneapolis, Bergquist Co.	612-835-2322
NM	Albuquerque, Bell Inds.	505-292-2700
NY	Hauppauge, Circuit Sls.	516-348-7670
NY	Plainview, A.C.I. Elctrns.	516-293-6630
NY	Ronkonkoma, Baldwin Comps.	800-645-5608
OH	Dayton, Bell Inds.	513-435-8660
PA	Exton, V.S.H. Corp.	215-363-2250
TX	Richardson, Bell Inds.	214-690-0466
WA	Redmond, Bell Inds.	206-885-9963
WI	Mequon, Taylor Elec.	414-241-4321

RAM CHEMICALS, DIV. WHITTAKER CORP., 210 E. Alondra Blvd., Gardena, CA 90248, Tel: 213-321-0710; Empl.: 100; *Sls. Mgr.:* Don Lopez; *Dist. Mgr.:* G. M. Steinman

RAMCOM SYSTEMS, 3007 Washington Blvd., Ste. 205, Marina Del Rey, CA 90292, Tel: 213-827-4432; *Sls. Mgr.:* Ralph Tisdale

RANK BRIMAR INC., 227 Technology Circle, Scotts Valley, CA 95066, Tel: 408-438-6440, FAX: 408-438-6334; FSC No.: 60750; *Sls. Mgr.:* David Hurst

RANSCO INDUSTRIES, INC., Sub. Despatch Ind., Inc., 1400 E. Statham Pkwy., Oxnard, CA 93033, Tel: 805-487-7777, TELEX: 6-59235; Empl.: 180; *Sls. Mgr.:* Robert Briner

RANTEC, Emerson Electric, 9401 Oso Ave., Chatsworth, CA 91311, Tel: 818-885-8223, TWX: 910-493-1247, FAX: 818-993-7780; Empl.: 200ò; *Sls. Mgr.:* Fred R. Silver

Local Sales Offices & Reps

CA	Chatsworth, Rantec	818-885-8223
CT	Norwalk, Nemarco	203-852-9117
FL	Deltona, Rantec	305-574-6569
NH	Pelham, Rantec	603-635-3503
NJ	Ridgefield Park, Nemarco	201-641-3893
NY	Blue Point, Nemarco	516-363-7295
VA	Sterling, Beacon North	703-478-2480

rantec®

FAX: 805-528-8132

RANTEC DIVISION, Emerson Electric Co., 1173 Los Olivos Ave., Los Osos, CA 93402, Tel: 805-528-5858, TELEX: 88-8863, TWX: 910-351-5802; FSC No.: 60132; Empl.: 145; *Sls. Mgr.:* Francesca Peterson ..... **D•2034-2036**

Local Sales Offices & Reps

CA	Huntington Beach, Mil-Com Sls., Inc.	714-840-2425
GA	Marietta, Electro Comp Sls., Inc.	404-922-2344
MO	Florissant, Palatine Engrg. & Sls., Inc.	314-839-0800

RAPID POWER TECHNOLOGIES, Graysbridge Rd., P.O.BOX 291, Brookfield, CT 06804, Tel: 203-775-0411, 800-332-1111, TELEX: 643:012, FAX: 203-775-0666; *Sls. Mgr.:* Mario Napolitano

RAPIDSUN, See Motion Control Grp., American Precision Inds.

RAPID SYSTEMS INC., 433 N. 34th St., Seattle, WA 98103, Tel: 206-547-8311, TELEX: 265017 UR, FAX: 206-548-0322; FSC No.: 91-1197314; Empl.: 30; *Sls. Mgr.:* Bo Ray

RASTER GRAPHICS, INC., P. O. Box 5157, Bend, OR 97701, Tel: 503-388-2584, FAX: 503-389-8249

RATELCO, Power Systems Div., 1260 Mercer, Dept. EEM, Seattle, WA 98109-5589, Tel: 206-624-7770, FAX: 206-382-5447; FSC No.: 14259; Empl.: 160; *Sls. Mgr.:* D. Terpstra

RAULAND-ZENITH ELECTRONICS CORP., 2407 W. North Ave., Melrose Pk., IL 60160, Tel: 312-450-8992, TELEX: 72-1488, FAX: 312-450-8985; Empl.: 2300

Raychem

RAYCHEM CORP., Elctrns. Grp., 300 Constitution Dr., Menlo Park, CA 94025, Tel: 415-361-3860, TELEX: 34-8316, TWX: 910-373-1728; *Sls. Mgr.:* Robert Simpson; *Dist. Mgr.:* Joseph Rodgers ..... **B•1407; C•1515, 1700**

RAYOVAC®

FAX: 608-275-4994

RAYOVAC CORPORATION, 601 Rayovac Drive, Madison, WI 53711-0960, Tel: 608-275-4692, TELEX: 190428; FSC No.: 6135; Empl.: 2000; *Sls. Mgr.:* Jeff Heberlein ..... **D•1519**

Local Sales Offices & Reps

AZ	Phoenix, Howe & Howe Sls.	602-264-7971
CA	Santa Clara, Nova-Tronix, Inc.	408-727-9530
CA	Westminster, West Elctrn. Sls. Co.	714-898-0120
CO	Englewood, William J. Purdy Co.	303-790-2211
IL	Park Ridge, G MCL Cole Co.	312-692-6040
IN	Indianapolis, Elctrn. Sls. & Engrg.	317-849-4260
IA	Cedar Rapids, R. W. Kunz & Assocs.	319-396-5386
KS	Prairie Vl, R. W. Kunz & Assocs.	913-648-3535
LA	New Orleans, The Hancoci Grp.	504-568-0580
MA	Framingham, Stone Comp. Sls.	617-875-3266
MO	St. Louis, R. W. Kunz & Assocs.	314-966-4977
NJ	Berkeley Hgts., Cambridge Allen & Assocs.	201-464-0203
NY	Skaneateles, Empire Tech. Assocs., Inc.	315-685-5703
OH	Westlake, Baehr Greenleaf	216-892-1770
OR	Beaverton, Pacific Mktg. Specialists, Inc.	503-641-9373
PA	Birchrunville, Jadelectronic Assocs., Inc.	215-296-3800
TX	Dallas, TESCO	214-553-1200
WA	Redmond, Pacific Mktg. Specialists, Inc.	206-882-3144

Local Distributors

AK	Anchorage, Frigid North	907-561-4633
AZ	Phoenix, Lynntronics	602-433-0288
AZ	Scottsdale, Cypress Elctrns.	602-949-0802
CA	Buena Pk., Cypress Elctrns.	213-635-8888
CA	Palo Alto, Power Source	415-856-0700
CA	San Diego, Cypress Elctrns.	619-535-0018
CA	San Jose, Rose Elctrns.	408-943-0440
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CA	Tustin, Image Elctrns.	714-259-0900
CO	Wheat Ridge, Cypress Elctrns.	303-431-7191
FL	Ft. Lauderdale, Selex/Southeastern	305-563-4131
GA	Norcross, Dow Elctrns.	404-446-2620
IL	Chicago, Neward Elctrns.	312-784-5100
KS	Wichita, RSC Elctrns.	316-267-5213
MD	Gaithersburg, Axis Elctrns.	800-368-2815
MA	Hingham, Saeger	617-749-6700
MA	Sharon, Adcour	1-800-343-2522
MO	Kansas City, Elctrn. Supp.	816-931-0250
NE	Lincoln, Scotts Elctrns.	402-466-8221
NV	Las Vegas, Kiesub	702-733-3888
NH	Nashua, Brevan Elctrns.	603-889-7230
NJ	W. Berlin, GCI Corp.	800-524-1463
NY	E. Farmingdale, Battery Expeditors	516-752-0011
NY	Hauppauge, Saeger	516-348-1300
NY	Rochester, Masline Elctrns.	716-546-5373
OH	Columbus, Promark	614-876-8885
OH	Reno, New Era	614-373-3384
OR	Beaverton, Micro-Power	503-626-7086
TX	Dallas, Norvell Elctrns.	214-233-0020
TX	Ft. Worth, Allied Elctrns.	1-800-433-5700
UT	Salt Lake City, Kimball Elctrns.	801-328-2075
WA	Seattle, Radar Elec.	206-282-2511

RAY PROOF, Shielding Systems Corp., 50 Keeler Ave., P.O. Box 5060, Norwalk, CT 06856-5060, Tel: 800-243-5704, TELEX: 96-5812; *Sls. Mgr.:* James A. Graham, VP Bus. Dev.

RAYTEK, INC., 1201 Shaffer Rd., Santa Cruz, CA 95060, Tel: 408-458-1110, TELEX: 171890; *Sls. Mgr.:* S. Brager; *Dist. Mgr.:* Stuart Brager

RAYTHEON CO., 465 Centre St., Quincy, MA 02169, Tel: 617-479-5300, TWX: 710-337-1020; *Sls. Mgr.:* R. Whitt

RAYTHEON CO., Laser Products, 465 Centre St., Quincy, MA 02169, Tel: 617-479-5300, TELEX: 92-3455, TWX: 710-324-6568, FAX: 617-479-5300 (ext. 2359); Empl.: 1000; *Sls. Mgr.:* B. Werschler

RAYTHEON CO., Microwave & Power Tube Div., 190 Willow St., Waltham, MA 02154, Tel: 617-899-8400, TWX: 710-324-8400, FAX: 617-899-5451; *Sls. Mgr.:* J. Hieber

RAYTHEON SEMICONDUCTOR, 350 Ellis St., Mountain View, CA 94043, Tel: 415-968-9211, TWX: 910-379-6481; FSC No.: 07933; Empl.: 1200; *Sls. Mgr.:* Al Enamait, Dir. Worldwide Sls.; *Dist. Mgr.:* R. Johnson

RAYTHEON/TAG SEMICONDUCTORS LTD., 43 Third Ave., Burlington, MA. 01803, Tel: 617-272-3704 (3705), TELEX: 988586 TAG SEMI LTD UD, ESYLNK: 62958778, FAX: 617-272-1280; Empl.: 7; *Sls. Mgr.:* B. Cavender; *Dist. Mgr.:* Pat Mobilia

RCA SOLID STATE DIV., See GE/RCA Solid State Div.

RCD COMPONENTS, INC., 520 E. Industrial Pk. Dr., Manchester, NH 03103, Tel: 603-669-0054, TELEX: 943-512 RCD COMP MAN, FAX: 603-669-5455; Empl.: 450 ..... **A•2042-2043**

Local Sales Offices & Reps

CA	Arcadia, Van Gott & Assoc.	818-445-9728
CA	Burlingame, William J. Purdy	415-347-7701
FL	Longwood, Beacon	407-332-1940
IL	Barrington, Lancastle Sls.	312-381-6780
MN	Eden Prairie, Twist Co.	612-941-2040
MO	Florissant, Delltron	314-839-0033
NJ	Leonia, Peter E. Schmitt	201-944-1096
OH	Cincinnati, Campisano	513-574-7111
TX	Dallas, Beacon Elec.	214-437-1505
UT	Salt Lake City, Sage Assoc.	801-467-5451
WA	Renton, Excel	206-277-1940
WI	Colgate, Rep One	414-628-4016

Local Distributors

CA	Anaheim, A to Z Inds.	714-634-3620
CA	City of Industry, Ital Elctrns.	213-968-8515
CA	San Diego, Neumann Elctrns.	619-695-3005
CA	San Jose, Compass Comps.	408-432-7575
CA	San Jose, Passive Technlg. Sls.	408-435-5566
FL	Longwood, Stetco	407-767-0209
FL	Tampa, Reptron	813-854-2358
IL	Hillside, Schuten Elctrns.	312-449-5430
IL	Lisle, Components, Inc.	312-852-7707
IN	Elkhardt, Earlynn Elctrns.	219-862-2425
IN	Wakarusa, Earlynn	219-862-2425
MA	Newton, Greeneshaw	617-969-8900
MA	Wilmington, Heilind Elctrns.	617-657-4870
MA	Wilmington, North Star Elctrns.	617-657-5155
MA	Worcester, Coghlin	800-922-8565
MI	Livonia, Reptron	313-525-2700
MN	New Brighton, Parts One	612-633-8079
NH	Nashua, Brevan Elctrns.	603-889-7130
NJ	Whippany, ADI	201-428-0510
NY	Bohemia, Key Comps. Inc.	516-567-7500
NY	Bohemia, RBD Elctrns.	516-589-7717
PA	McKean, Advacom	814-476-7774
PA	Reading, Barbey Elctrns.	215-376-7451
TX	Ft. Worth, Allied Elctrns.	800-433-5700
WA	Redmond, Priebe Elctrns.	206-881-2363
WI	Oshkosh, Elctrn. Inds.	414-235-8930

R. C. ELECTRONICS INC., 5386 Hollister Ave., Ste. D, Santa Barbara, CA 93111, Tel: 805-964-6708, FAX: 805-964-4906; Empl.: 15; *Sls. Mgr.:* Chao-Sun Pang; *Dist. Mgr.:* Chao-Sun Pang

RCL-SHALLCROSS, 195 McGregor St., Manchester, NH 03102, Tel: 603-627-3831, TWX: 710-220-1876, FAX: 603-623-5610; FSC No.: 01686; Empl.: 400

RCL-SHALLCROSS, INC., U.S. Hwy. 70 East, Smithfield, NC 27577, Tel: 919-934-5181, TWX: 510-939-1463, FAX: 919-934-5186; FSC No.: 54294; Empl.: 150 ..... **A•1959, 1961; B•1015, 1017**

See RCL-Shallcross for Local Sales Reps. and Distributors

R-COLUMBIA PRODS. CO., INC., 2008 St. Johns Ave., Highland Park, IL 60035, Tel: 312-432-7915, TWX: 910-692-2160; Empl.: 20

RDI ELCTRNS., INC., 56 Harrison St., New Rochelle, NY 10801, Tel: 914-632-2828, FAX: 914-632-7464; Empl.: 9; *Sls. Mgr.:* Barry Miller

REACTEL, INC., 687-D Lofstrand La., Rockville, MD 20850, Tel: 301-279-5535, FAX: 301-340-7304; FSC No.: 60458; Empl.: 30; *Sls. Mgr.:* D. E. Claycomb

Local Sales Offices & Reps

CA	Sunnyvale, ESCO Assocs.	408-745-1410
FL	Clearwater, Brennan Assocs.	813-446-5006
NJ	Keansburg, Reps Five	201-495-2315
VA	Fairfax, Beacon North	703-591-1300

REAL TIME DEVICES, INC., Matternville Ctr., US 322, Port Matilda, PA 16870, Tel: 814-234-8087, TELEX: 4948141 SEDACOG; Empl.: 15

Rebco

REBCO INTERNATIONAL, 4960 Minas Dr., San Jose, CA 95136, Tel: 408-723-2932; Empl.: 19; *Sls. Mgr.:* Janice Borland; *Dist. Mgr.:* Andrew Real

RECOGNITION TECHNOLOGY, INC., 160 E. Main St., Westborough, MA 01581, Tel: 617-366-4800, FAX: 508-898-9351; Empl.: 12; *Sls. Mgr.:* J.A. Maddocus

RECORDER SYS. DIV., See Gulton Instruments Div.

RECORTEC, INC., 275 Santa Ana Ct., Sunnyvale, CA 94086, Tel: 408-737-8441, TWX: 910-379-5022, FAX: 408-737-8448; *Sls. Mgr.:* R. R. Troxell

RECOTON CORP., 46-23 Crane St., Long Island City, NY 11101, Tel: 718-392-6442, TELEX: 236047 RCTN, FAX: 718-784-1080; Empl.: 150; *Sls. Mgr.:* Peter Dayton

REDINGTON COUNTERS, 130 Addison Rd., Windsor, CT 06095, Tel: 203-688-6205, FAX: 203-688-1591; *Sls. Mgr.:* Dennis O'Shea; *Dist. Mgr.:* Dennis O'Shea

RED SQUARE COMPANY, 11770 Warner Ave., Ste. 226, Fountain Valley, CA 92708, Tel: 714-751-1373; *Sls. Mgr.:* Ed Burg

REEVE ELECTRONICS, Mellish E. Murray, 1715 W. Carroll Ave., Chicago, IL 60612, Tel: 312-670-0150; Empl.: 25; *Sls. Mgr.:* Ed Martinez

REEVES-HOFFMAN
DIVISION DYNAMICS CORPORATION OF AMERICA

FAX: 717-243-0079

REEVES-HOFFMAN DIV., Dynamics Corporation of America, 400 W. North St., Carlisle, PA 17013, Tel: 717-243-5929; Empl.: 340; *Sls. Mgr.:* Larry Barbary ..... **A•1472-1476; C•1624-1626**

Local Sales Offices & Reps

AZ	Phoenix, Chaparral Elctrns.	602-252-0897
CA	Culver City, Westaironics	213-641-4123
CA	Mountain View, Peninsula Tech. Sls.	415-965-3636
CO	Boulder, R.G. Entprs.	303-447-9211
FL	Tampa, APM Assocs.	813-886-2457
GA	Duluth, DTM, Inc.	404-381-5592
IL	Des Plaines, ESCO Assocs.	312-298-5310
MD	Ellicott City, Nelson Elctrns.	301-747-7887
MA	Wakefield, H. Jappe Co.	617-245-9359
MN	Minneapolis, Intl. Elctrns.	612-571-0000
OH	Cincinnati, Tri-State Mktg.	513-761-7993
PA	Hatboro, Electro Rep Engrg.	215-674-4421
TX	Irving, Kite Elctrns. Sls.	214-438-9336
Can	Rexdale, Ont., Myelco, Inc.	416-674-1636

REGDON SOLENOID, INC., 401 Plaza Drive, Westmont, IL 60559, Tel: 312-789-0600, FAX: 312-789-0614; FSC No.: 27190; Empl.: 65 ..... **B•1670-1671**

Local Sales Offices & Reps

AL	Decatur, Tenn Tech	205-350-0630
CA	Los Altos, J. W. Wilhoit	415-961-3660
CA	Valencia, DJM Elctrns.	818-362-4309
CT	Woodbury, Mark-Rep Assocs.	203-263-3047
FL	Maitland, EIR, Inc.	305-660-9600
GA	Atlanta, Tenn Tech	404-622-5784
IL	Downers Grove, Richmar Elect. Corp.	312-968-0118
IN	Indianapolis, Richmar Elctrns.	317-846-6383
MN	Hopkins, S. J. Collins & Assocs.	612-933-7661
NH	Plaistow, Mark-Rep Assocs.	603-382-9563
NJ	Florham Park, Varrelman-Gorman Co.	201-992-2505
NY	Binghamton, NHA	607-754-3214
NY	Pittsford, NHA	716-586-9002
NC	Raleigh, Tenn Tech	919-266-3610
OH	Cleveland, J. N. Bailey	216-892-1510
OH	New Lebanon, J. N. Bailey	513-687-1325
PA	Huntingdon Valley, Edwin Leiby & Assocs.	215-659-8938
TN	Chattanooga, Tenn Tech.	615-894-3012
TX	Plano, K & H Sales	214-423-6520
WI	Butler, Richmar Elctrns.	414-781-1730

Local Distributors

CA	San Carlos, Logan Elctrn. Supp.	415-594-0700
MA	Lynn, Land Elctrns.	617-592-2220
NJ	Fairlawn, Relay Specialties	201-797-3313

REGENCY LAND MOBILE, INC., 7707 Records St., Indianapolis, IN 46226, Tel: 317-545-4281, FAX: 317-545-2170; Empl.: 500

REGENT CONTROLS, INC., 39 Fanny St., P.O. Box 767, Shelton, CT 06484-0767, Tel: 203-736-2924, FAX: 203-736-2928; Empl.: 35; *Sls. Mgr.:* Lora C. Minor

REHLANDER ASSOCS., 118A Bridge St., Beverly, MA 01915, Tel: 617-922-5961; *Sls. Mgr.:* Michael Rehlander

REICH ASSOCIATES, Rt. 4, Box 4620, Lakehills, TX 78063, Tel: 512-751-3220, TELEX: 358048, ESYLNK: 62705740, FAX: 512-751-3054; FSC No.: 55916; Empl.: 10; *Sls. Mgr.:* W. Reich

RE INSTRUMENTS CORP., 31029 Center Ridge Rd., Westlake, OH 44145, Tel: 216-871-7617, FAX: 216-871-4303; Empl.: 15; *Sls. Mgr.:* P. A. Bosworth

REKCO, INC., See LEM/Rekco

RELAY SERVICE CO., 1300 N. Pulaski Rd., Chicago, IL 60651, Tel: 312-252-2700, FAX: 312-252-0300; Empl.: 25; *Sls. Mgr.:* Chas. H. Badger

Local Sales Offices & Reps

CA	Santa Cruz, Le Rep	408-458-0667
CA	Vista, Sado Sls.	619-941-2654
CO	Broomfield, Sunbird Inds., Inc.	303-460-9199
CO	Monument, Sunbird Inds., Inc.	303-481-2900
CT	Bethany, Reps. Corp.	203-393-0024

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IL	Woodridge, Trend-Tronics	312-985-0626
IN	Ft. Wayne, Naunas Sls.	219-432-4792
MA	Wellesley, Reps. Corp.	617-237-6476
NY	New Rochelle, Repco Assocs.	914-235-6405
OH	Goshen, John O. Olsen	513-722-3320
OH	Warfield Hgts., John O. Olsen	216-662-3454
OR	Beaverton, Cascade Sls. Co.	503-626-7978
PA	Glenside, Shelmar Elctrns. Corp.	215-885-0800
PA	Pittsburgh, John O. Olsen	412-279-2550
TX	Lewisville, Elctrn. Prod. Reps.	214-436-4772

Distributor

RELAY and Switch SPECIALTIES INC.

FAX: 201-337-1862

RELAY SPECIALTIES, 17 Raritan Rd., Oakland, NJ 07436, Tel: 201-337-1000, TELEX: 642751; Empl.: 48; *Sls. Mgr.:* S. R. Gershberg

.....603, 609, 621, 622, 643, 648, 659, 693, 698, 717, 744, 772

RELCO PRODUCTS, 5594 E. Jefferson Ave., Denver, CO 80237, Tel: 303-756-1143; FSC No.: 14454; Empl.: 7

Reliability® Incorporated

FAX: 713-492-0615

RELIABILITY, INC., P. O. Box 218370, Houston, TX 77218, Tel: 713-492-0550, TELEX: 4620383 RELUI; *Sls. Mgr.:* Len Moscovitz; *Dist. Mgr.:* J. Marcussen/Steve Popst ..... **D•2037**

Local Sales Offices & Reps

AL	Decatur, El Tech, Inc.	205-353-7899
AL	Huntsville, El Tech, Inc.	205-883-5030
AZ	Scottsdale, Electronic Tech. Sls.	602-941-9137
CA	Mountain View, Straube Assocs.	415-969-6060
CO	Denver, AKI Entpr.	303-388-4488
CT	Madison, Omni-Rep	203-421-4561
FL	Clearwater, Sigma Tech. Assoc., Inc.	813-791-0271
FL	Ft. Lauderdale, Sigma Tech. Assoc., Inc.	305-731-5995
GA	Lilburn, El Tech, Inc.	404-564-1236
IL	Schaumburg, Tech-Tron Sls., Inc.	312-843-7580
IN	Ft. Wayne, Jim Finnegan & Co.	219-747-9525
KS	Leneva, Mid Tec	913-541-0505
KY	Ft. Wright, El Tech, Inc.	606-331-3495
MD	Westminster, Eastern Comp. Sls.	301-875-0626
MA	Burlington, Omni-Rep	617-245-4511
MI	Jenison, R. C. Nordstrom	616-457-5762
MI	Southfield, R. C. Nordstrom & Co.	313-559-7373
MN	Minneapolis, George Russell & Assocs.	612-854-1166
MO	St. Louis, Mid Tech	314-275-8666
NJ	West Caldwell, Mariniello Tech. Sls.	201-228-4418
NY	Rochester, Electra Sls. Corp.	716-427-7860
NC	Raleigh, Electro-Mech	919-790-9300
OH	Columbus, Tom Mulligan & Co.	614-457-2242
OK	Tulsa, Advance Tech. Sls.	918-664-0482
PA	W. Conshohocken, Eastern Comp. Sls.	215-825-8610
RI	Cumberland, Omni-Rep	401-333-2353
TX	Austin, Advanced Tech. Sls.	512-467-9209
TX	Dallas, Advanced Tech. Sls.	214-340-1300
TX	Houston, Advance Tech. Sls.	713-440-3888
VA	Sterling, Eastern Comp. Sls.	703-444-1089
VA	Venton, Eastern Comp. Sls.	703-344-4756
Can	Langley, B.C., Electro Source, Inc.	604-888-2412
Can	Nepean, Ont., Electro Source, Inc.	613-592-3214
Can	Pointe Claire, Que., Electro Source, Inc.	514-630-7486
Can	Rexdale, Ont., Electro Source, Inc.	416-675-4490

Local Distributors

AZ	Phoenix, Force Elctrns.	602-437-1060
AZ	Phoenix, Sterling Elctrns.	602-268-2121
CA	Calabasas, Milgray	818-704-0041
CA	El Segundo, Force Elctrns.	213-772-1324
CA	North Hollywood, B.J. Wolfe co.	213-877-5518
CA	San Diego, Force Elctrns.	619-569-9661
CA	San Jose, B.J. Wolfe Co.	408-371-3443
CA	San Jose, Force Elctrns.	408-435-1324
CO	Englewood, Sterling Elctrns.	303-792-3939
CT	Bethel, Heilind Elctrns.	203-797-8600
CT	Milford, Milgray	203-878-5538
CT	Wallingford, Sager Elctrl. Supp.	203-265-4600
CT	Wallingford, Sterling Elctrns.	203-265-9535
FL	Winter Park, Milgray	407-647-5747
GA	Norcross, Milgray	404-446-9777
IL	Arlington Hgts., Milgray	312-253-1212
IL	Bensenville, Voyager Elctrns.	312-860-1300
KS	Overland Park, Milgray	913-236-8800
KS	Overland Park, Sterling Elctrns.	913-236-5589
LA	Westwego, Sterling Elctrns.	504-436-1418
MD	Columbia, Milgray	301-621-8169
MD	Columbia, Sager	301-995-6580
MA	Wilmington, Heilind Elctrns.	617-657-4870
MA	Wilmington, Milgray	508-657-5900
MA	Wilmington, Northstar Elctrns.	508-657-5900
MA	Woburn, Sterling Elctrns.	617-938-6200
MI	Mt. Clemens, Milgray	313-791-8200
MN	Fridley, Sager Elctrns.	612-571-7766
MN	Minneapolis, Sterling Elctrns.	612-831-2666
NJ	Marlton, Milgray	609-983-5010
NJ	Parsippany, Milgray	201-335-1766
NJ	South Plainfield, Sterling Elctrns.	201-769-7000
NM	Albuquerque, Sterling Elctrns.	505-884-1900
NY	Farmingdale, Milgray	516-391-3000
NY	Happauge, Sager Elctrn. Supp.	516-348-1300
NY	Rochester, Milgray	716-235-0830
NC	Raleigh, Sager Svc. Plus	919-850-9550
OH	Cleveland, Milgray	216-447-1520
OH	Dayton, Koenlke Comps. (KCI)	513-435-5435
OK	Tulsa, Sterling Elctrns.	918-663-2410
PA	Trevos, Sager Elctrn. Supp.	215-638-7491
TX	Austin, Sterling Elctrns.	512-836-1341
TX	Dallas, Force Elctrns.	214-247-9955
TX	Dallas, Milgray	214-248-1603
TX	Dallas, Sterling Elctrns.	214-243-1600
TX	Houston, Sterling Elctrns.	713-623-6600
UT	Salt Lake City, Milgray	801-272-4999
VA	Herndon, Sterling Elctrns.	703-742-8400
Can	Willowdale, Ont., Milgray	416-756-4481

RELIANCE COMM/TEC, Reliance Electric, P. O. Box 99502, Cleveland, OH 44199, Tel: 800-245-4501

RELIANCE ELECTRIC CO., Marketing Info Center, P.O. Box 99502, Cleveland, OH 44199, Tel: 800-245-4501

RELIANCE PLASTICS & PACKAGING, 225 Belleville Ave., Bloomfield, NJ 07003, Tel: 201-748-2222, FAX: 201-748-5257; Empl.: 60; *Sls. Mgr.:* Hale Smith

REMEE PRODUCTS CORP., 41 Bridge St., Florida, NY 10921, Tel: 914-651-4431, TELEX: 64-6715, FAX: 914-651-4160; FSC No.: 4R362; Empl.: 135; *Sls. Mgr.:* Ken Pimental; *Dist. Mgr.:* Ken Pimental

REMTEK CORPORATION, 46107 Landing Parkway, Fremont, CA 94538, Tel: 415-490-3999, FAX: 415-659-1849; Empl.: 40; *Sls. Mgr.:* Robert A. Wold; *Dist. Mgr.:* Robert T. Collins ..... **C•1701**

Local Sales Offices & Reps

AZ	Tempe, Rich Sls. Co.	602-968-7787
CA	Fallbrook, Gary Chilcote Assocs.	619-728-7678
CA	Fremont, Nicor-II	415-490-5975
CA	Fremont, Remtek Corp.	415-490-3999
CA	Montrose, Signal Entprs.	818-957-0640
CO	Boulder, R. F. Mayo & Assocs.	303-442-2155
FL	Deerfield, Brandel Stephens	305-427-8558
GA	Marietta, Remtek Corp.	404-977-1630
IL	Deerfield, Flaherty-Haines	312-948-7800
IN	Ft. Wayne, Hoyle Assocs.	219-485-6433
KS	Overland Park, Spectrum Sls.	913-648-6811
MA	Clinton, Browning & Naughton	617-365-6365
MI	Birmingham, Forand Sls. Co.	313-644-0087
MN	Eden Prairie, EMT Engrg.	612-934-4147
NJ	Hicksville, J-Square Mktg.	516-935-3200
NY	Rochester, L-Mar Assocs.	716-323-1000
OH	Cleveland, Versatron	216-581-0090
OR	Tualatin, Nicor-I	503-692-0421
PA	Telford, Dalbrook	215-723-3300
TX	Dallas, R. D. Spooner	214-357-6636

RENARD MANUFACTURING COMPANY, INC., 3131 N.W. 79th Avenue, Miami, FL 33122-1011, Tel: 305-592-1500, TELEX: 989326, ESYLNK: 62929141, FAX: 305-593-9990; *Sls. Mgr.:* S. Simerly

RENCO, Robbins & Myers, 26 Coromar Dr., Goleta, CA 93117-3094, Tel: 805-968-1525, TWX: 910-334-1180; FSC No.: 34479; Empl.: 100; *Sls. Mgr.:* Sid Russell; *Dist. Mgr.:* Sid Russell

RENCO ELECTRONICS, INC. CONSISTENT SERVICE START TO FINISH

FAX: 516-586-5562

RENCO ELECTRONICS, INC., 60 Jefryn Blvd., East, Deer Pk., NY 11729, Tel: 516-586-5566, 1-800-645-5828, TELEX: 220-883; FSC No.: 14778; Empl.: 200; *Sls. Mgr.:* Edward W. Rensing; *Dist. Mgr.:* Rhonda Rizzo ..... **A•1293-1297, 2435-2439**

Toll-Free Engineering Hot Line 800-645-5828, in NY State 516-586-5566

Local Sales Offices & Reps

CA	Arcadia, Van Gott & Assoc.	818-445-9728
CA	La Jolla, Coastal Elctrn. Sls.	619-459-4148
CA	Santa Clara, Cummings & Assoc.	408-247-8656
IL	Schaumburg, Tech-Tron Sls.	312-843-7530
NY	Buffalo, NRM Mktg. Grp.	716-634-4300
NC	Kernsville, El-Tech-East	919-996-8885
AR	Ft. Smith, Electra Reps	501-452-7822
CA	San Diego, Coastal Sls.	619-459-4148
CO	Parker, The Remington Grp.	303-841-0523
CT	Norwalk, Northeast Reps.	203-886-6030
FL	Casselberry, Symco	407-695-6010
IA	Davenport, Rush & West Assocs.	319-388-9494
KS	Olathe, Rush & West Assocs.	913-764-2700
MD	Gaithersburg, Eltron Sls.	301-963-7082
MA	Hingham, Northeast Reps.	617-749-8700
MN	Minneapolis, All Phase	612-835-4940
MO	St. Louis, Rush & West Assocs.	314-965-3322
NH	Nashua, Northeast Reps.	603-880-8199
NJ	Marlton, BGR Assocs.	609-983-1020
OH	Columbus, Baehr Greenleaf & Assocs.	614-486-4046
OH	Westlake, Baehr Greenleaf & Assocs.	216-892-1770
OR	Hillsboro, Temco Northwest	503-649-8375
PA	Evans City, Baehr Greenleaf & Assocs.	412-776-2151
TX	Austin, Electra Reps	512-339-1163
TX	Dallas, Electra Reps	214-248-3852
UT	Parker, The Remington Grp.	303-841-0523
VA	Front Royal, Eltron Sls.	703-635-1933
WA	Kirkland, Temco Nortwest	206-823-6388
WI	Milwaukee, Bert Wartchow Assocs.	414-964-0942
Can	Montreal, Eli Manis, Inc.	514-861-5571

REN ELECTRONICS CORPORATION, C.C.G., An Insico Co., 755 New Ludlow Rd., S. Hadley, MA 01075, Tel: 413-536-1800, TELEX: 315617, FAX: 413-536-8425; FSC No.: 70143; Empl.: 75; *Sls. Mgr.:* S. W. Pai, Div. Mgr.

REPRODUCTION TECHNOLOGIES INC., Dept. EM, P.O. Box 790, Bristol, IN 46507-0518, Tel: 219-848-5233, TELEX: 510 600 2378 R T I; Empl.: 10; *Sls. Mgr.:* Maxine Beasey

REPUBLIC ELECTRONICS CO., 200 Wireless Blvd., Hauppauge, NY 11788, Tel: 516-273-9800, TELEX: 96-1460; FSC No.: 95750; Empl.: 145; *Sls. Mgr.:* Sy Newman

RESDEL ENGRG. CORP, Resdel Inds., 300 E. Live Oak Ave., Arcadia, CA 91006, Tel: 213-684-2600, TWX: 910-582-3219; FSC No.: 10412; Empl.: 225

RESEARCH DEVICES, The American Optical Corp., 121 Ethel Rd., Piscataway, NJ 08856, Tel: 201-572-4800, TELEX: 467058, FAX: 201-572-4808; Empl.: 25; *Sls. Mgr.:* Michael Schneider

RESEARCH SPECIALISTS, 1816 Settlers Oval, Cleveland, OH 44145, Tel: 216-871-8909; Empl.: 10; *Sls. Mgr.:* Tim Howard

RESISTANCE TECHNOLOGY INC., 1260 Red Fox Rd., St. Paul, MN 55112, Tel: 612-636-9770, FAX: 612-636-8944; *Sls. Mgr.:* T. Michael Ferris

resistors, inc.

FAX: 312-863-4272

RESISTORS, INC., 5226 W. 26th St., Chicago, IL 60650, Tel: 312-652-7555; Empl.: 35; *Sls. Mgr.:* Marlene Pingel ..... **A•2040**

Local Sales Offices & Reps

CA	Santa Clara, K M Entprs.	408-986-1458

FAX: 408-982-0210

RESONANT POWER TECHNOLOGY, 3350 Scott Boulevard, Bldg.5302, Santa Clara, CA 95054, Tel: 408-982-0200; FSC No.: 0BZ13; Empl.: 10; *Sls. Mgr.:* Dan H. Burgoon ..... **D•2038-2039**

Local Sales Offices & Reps
FL Land O Lakes, AJ'S Power Source 813-996-2583
NH Salem, OEM Marketing & Sales 603-893-0009
TX Richardson, Jim Gray & Associates ... 214-699-9976

REVERE CORPORATION OF AMERICA, 845 N. Colony Rd., Wallingford, CT 06492, Tel: 203-269-7701, TELEX: 96-3482, TWX: 710-476-3197; Empl.: 389; *Sls. Mgr.:* R. Paukstys

RFI CORPORATION, 100 E. Pine Aire Dr., Bay Shore, NY 11706, Tel: 516-231-6400, TWX: 510-227-6233, FAX: 516-231-6465; FSC No.: 13619; Empl.: 250; *Sls. Mgr.:* Dave Radford ..... **A•1667**

Local Sales Offices & Reps
AL Huntsville, Murcota Corp. 205-539-8476
AZ Scottsdale, Williams-Assocs. 602-947-4297
CA Alhambra, M.W. Riedel Co. 213-283-7694
CA Mountain View, Peninsula Tech. Sls. .. 415-965-3636
CO Commerce City, Williams Assocs. 303-289-5647
FL Clearwater, Tech-Rep Assocs. 813-572-9900
FL Ft. Lauderdale, Tech Rep Assocs. 305-791-2708
FL Merritt Island, Tech-Rep Assocs. 407-453-3313
FL Winter Springs, Tech-Rep Assocs. 407-699-4010
IL Palatine, Technlg. Sls., Inc. 312-991-6600
IN Fort Wayne, Denton Mktg., Inc. 219-486-0665
IA Cedar Rapids, Ensco-Rep 319-396-1109
KS Countryside, Ensco-Rep 913-384-0840
KS Wichita, Ensco-Rep 316-683-1070
MD Rockville, Mechtronics Sls. 301-340-2130
MO Maryland Heights, Ensco-Rep 314-423-3935
NH Hudson, EMC Sls., Inc. 603-889-5751
NJ Cherry Hill, H.J. White Co. 609-428-4544
NM Albuquerque, Williams-Assocs. 505-255-1638
NY Buffalo, Upstate Engrg. Sls. 716-632-0011
NY Great Neck, Trionic Assocs. 516-466-2300
NY Rochester, Upstate Engrg.Sls. 716-225-2383
NY Utica, Upstate Engrg.Sls. 315-797-6721
NC Winston-Salem, Murcota Corp. 919-722-9445
PA Glenside, Koebert Assocs.,Inc. 215-887-2310
TX Garland, McBride Sci. Sls. 214-494-5000
UT Salt Lake City, Williams Assocs. 801-485-6511
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RF INDUSTRIES, Celltronics, 10040 Mesa Rim Rd., San Diego, CA 92121, Tel: 619-587-0656, FAX: 619-587-0049

RFL INDS., INC., (DBA) Dowty Elctrns. Co., PO Box 250 Prospect St., Brandon, VT 05733, Tel: 802-247-6811, FAX: 802-247-3946; Empl.: 130; *Sls. Mgr.:* Dan Boutin; *Dist. Mgr.:* Dan Boutin

RF MONOLITHICS, INC., 4441 Sigma Rd., Dallas, TX 75244, Tel: 214-233-2903, TELEX: 463-0088, FAX: 214-387-8148; FSC No.: 2U874; Empl.: 90; *Sls. Mgr.:* C. Baker, T. Hinkle, W. Spurgeon

R.F. POWER LABS., 22125 17th Ave. S.E., , Bothell, WA 98021, Tel: 206-481-8833, TELEX: 32-1042, FAX: 206-486-1002; FSC No.: 057143; Empl.: 17; *Sls. Mgr.:* Glenn Kalmus

RHG ELECTRONICS LABORATORY, INC., Adams Russell, 161 E. Industry Ct., Deer Park, NY 11729, Tel: 516-242-1100, TWX: 510-227-6083, FAX: 516-242-1222; Empl.: 214; *Sls. Mgr.:* David E. Krautheimer

FAX: 714-896-0971

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CA Santa Clara, Westrep 408-988-8833
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MA Malden, J. K. Assocs. 617-321-2922
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TX Houston, Space Elctrns. 713-266-9245
TX Irving, Space Elctrns. 214-251-3636
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CA Manhattan Bch., Prime Electro Prods. 213-379-3642
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CA San Diego, Sterling Elctrns. 619-271-6558
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RICHARD-LEE CO., 3 Quine St., Cranford, NJ 07016, Tel: 201-276-0710, FAX: 201-276-6179; Empl.: 13

RICHARDS, ARKLAY S., CO., INC., 72 Winchester St., Newton Highlands, MA 02161-1793, Tel: 617-527-4385, FAX: 617-964-3746; *Sls. Mgr.:* L. K. Richards

RICHARDSON ELECTRONICS, LTD., 40W267 Keslinger Rd., LaFox, IL 60147, Tel: 800-323-1770, 312-232-6400, TELEX: 283461RichElecLFox, FAX: 312-208-2550; FSC No.: 5L804; Empl.: 625; *Sls. Mgr.:* William Burton; *Dist. Mgr.:* William Burton

RICHCO PLASTIC CO., P.O. Box 804238, Chicago, IL 60680, Tel: 312-539-4060, TWX: 910-221-1938, FAX: 312-539-6770; FSC No.: 06915; Empl.: 250; *Sls. Mgr.:* Ted E. Pavoris; *Dist. Mgr.:* Ted Pavoris

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FAX: 308-235-2609

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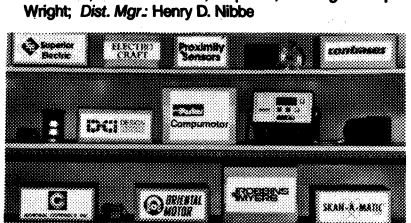

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RMS TECHN., 11833 Canon Blvd., Ste 100, Newport News, VA 23601, Tel: 804-873-0100, FAX: 804-873-1512; FSC No.: 59606; Empl.: 42

ROANWELL, 180 Varick St., New York, NY 10014, Tel: 212-989-1090, TWX: 710-581-6555, FAX: 212-989-3285; FSC No.: 82872; Empl.: 80; *Sls. Mgr.:* Ray Lefebvre; *Dist. Mgr.:* Ray Lefebvre

RO ASSOCIATES

FAX: 408-744-1521

RO ASSOCIATES, INC., 246 Caspian Dr., Box 61419, Sunnyvale, CA 94088, Tel: 408-744-1450; FSC No.: 24230; Empl.: 90; *Sls. Mgr.:* R. D. Okada ..... **B•1028-1030; D•2042-2045**

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ROBBINS & MYERS/ELECTRO-CRAFT, 6950 Washington Ave. So., Eden Prairie, MN 55344, Tel: 612-942-3600, FAX: 612-942-3636; *Sls. Mgr.:* Harry Webber

ROBERT SHAW INSTRUMENT DIV., Kendall Lane, Natick, MA 01760, Tel: 617-875-9711, TWX: 710-346-0398, FAX: 617-872-8437; Empl.: 600; *Sls. Mgr.:* David LeBlanc

ROBINSON-HALPERN PRODUCTS, Transicoil, Inc., One Apollo Rd., P.O. Box 248, Plymouth Meeting, PA 19462-0248, Tel: 215-825-9200, TWX: 510-660-9200, FAX: 215-834-1917; FSC No.: 12400; Empl.: 80; *Sls. Mgr.:* Robert C. Rehborn, Prod. Mgr.

ROBINSON NUGENT, INC., 800 East 8th St., New Albany, IN 47150, Tel: 812-945-0211, TWX: 810-540-4082, FAX: 812-945-0804; Empl.: 567; *Sls. Mgr.:* Terry Johnson; *Dist. Mgr.:* Vic Siccone

ROBISON ELECTRONICS, P.O. Box 8121, San Luis Obispo, CA 93403-8121, Tel: 805-544-8000, FAX: 805-544-8091; FSC No.: 19080; Empl.: 45

ROCHESTER INSTRUMENT SYSTEMS, 255 N. Union St., Rochester, NY 14605, Tel: 716-263-7700, TELEX: 978457, TWX: 82971, FAX: 716-262-4777; Empl.: 330

ROCKLAND INSULATED WIRE & CABLE, 87 Broadway, Haverstraw, NY 10927, Tel: 914-429-3103, FAX: 914-947-1712; FSC No.: 12111

ROCKLAND SCIENTIFIC CORPORATION, 10 Volvo Dr., Rockland Indl. Pk., Rockleigh, NJ 07647, Tel: 201-767-7900, TWX: 710-991-9852, FAX: 201-767-1890; Empl.: 60; *Sls. Mgr.:* M. Schiavone

ROCKWELL INT'L:SEMICONDUCTOR PRODUCTS DIVISION, 4311 Jamboree Rd., Newport Beach, CA 92660, Tel: 714-833-4600, TWX: 910-591-1698; FSC No.: 34576; Empl.: 1995; *Sls. Mgr.:* Jack Ordway, Dir. of Sls.; *Dist. Mgr.:* K. Reutemann

RODANN ELECTRONICS MFG. CO., 133 S. Brea Blvd, Brea, CA 92621, Tel: 714-529-1301; *Sls. Mgr.:* Alex Skarbek

RODELCO ELECTRONICS CORP., 111 Haynes Ct., Ronkonkoma, NY 11779, Tel: 516-981-0900, FAX: 516-981-1792; Empl.: 44

ROD-L ELECTRONICS, INC.

FAX: 415-326-1993

ROD-L ELECTRONICS, INC., 923 Hamilton Ave., Menlo Park, CA 94025, Tel: 415-322-0711, TWX: 296210; Empl.: 20; *Sls. Mgr.:* Tom Cooke ..... **D•1338-1339**

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IN Indianapolis, Loren Green Assocs. 317-293-9827
KS Lenexa, Midtec Assocs. 913-541-0505
MD Cockeysville, Sci. Reps. 301-321-1411
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Can Ontario, Webster Instrs. Ltd. 416-625-0600

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ROEAN INDUSTRIES, INC., 12970 Branford, Ste. C, Pacoima, CA 91331, Tel: 818-767-7047, FAX: 818-768-4974; Empl.: 8

ROGAN, 3455 Woodhead Dr., Northbrook, IL 60062, Tel: 312-498-2300, 800-423-1543, FAX: 312-498-2334; FSC No.: 86797; Empl.: 100; *Sls. Mgr.:* D. Pelletier; *Dist. Mgr.:* D. Pelletier

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ROHDE & SCHWARZ, INC., 4425 Nicole Drive, Lanham, MD 20706, Tel: 301-459-8800, FAX: 301-459-2810; FSC No.: 82199; Empl.: 65; *Sls. Mgr.:* David R. Cook

ROHM CORPORATION, 8 Whatney, Irvine, CA 92718, Tel: 714-855-2131, TWX: 910-595-1721, FAX: 714-855-1669; Empl.: 125

ROLM SYSTEMS DIVISION, IBM Corp., 4900 Old Ironsides Dr., M/S 605, Santa Clara, CA 95054, Tel: 408-986-1000; Empl.: 4,100; *Dist. Mgr.:* Ken Batorski

ROLYN OPTICS CO., 706 Arrowgrand Circle, Covina, CA 91722-2199, Tel: 818-915-5707/5717, TELEX: 67-0380, FAX: 818-915-1379

ROSE ELECTRONICS,INC. DIV. OF ENERGY PRODUCTS GROUP, 1991 Concourse Dr., San Jose, CA 95131, Tel: 408-943-0440, FAX: 408-943-0360; Empl.: 13; *Sls. Mgr.:* Bob Burres; *Dist. Mgr.:* Bob Burres

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ROWE INDUSTRIES, INC., 6225 Benore Rd., P.O. Box 6877, Toledo, OH 43612, Tel: 419-729-9761, TWX: 810-442-1734; FSC No.: 82878; Empl.: 89; *Sls. Mgr.:* Nick Ladas; *Dist. Mgr.:* Nick Ladas ..... **C•1517-1519, 1922**

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CT	Plantsville, Allied Control	203-621-6771

RUSH ENTERPRISES INC.:A HEICO COMPANY, 20 Hampshire Drive, Hudson, NH 03051, Tel: 603-886-9460, FAX: 603-886-0372; Empl.: 12; *Sls. Mgr.:* Richard Mulcahy

RUSSTECH ENGINEERING COMPANY, INC., 23322 (D) Madero Road, Mission Viejo, CA 92691, Tel: 714-472-0880, FAX: 714-951-4601

RUSTRAK INSTRUMENTS, Mark IV Company, Rte. 2 & Middle Rd., E. Greenwich, RI 02818, Tel: 401-884-6800, 800-332-3202, TWX: 710-387-1500; Empl.: 250; *Sls. Mgr.:* John Olobri; *Dist. Mgr.:* John Olobri

RUTHERFORD RESEARCH, Box 249, Rutherford, NJ 07070, Tel: 201-933-2091; Empl.: 4; *Sls. Mgr.:* Dr. A. Blanck; *Dist. Mgr.:* Dr. A. Blanck

DYTRONICS

FAX: 614-885-8307

RYAN INTERNATIONAL CORP., 4800 Evanswood Dr., Columbus, OH 43229-6207, Tel: 614-885-3303; Empl.: 30 ..... **D•1341**

RYE INDUSTRIES, INC., 125 Spencer Pl., P.O. Box M, Mamaroneck, NY 10543, Tel: 914-698-0080; Empl.: 50

S A B NIFE, INC., Div. of Sonesson, P.O. Box 7366, 251 Industrial Blvd., Greenville, NC 27834, Tel: 919-830-1600, TELEX: 92-9407; Empl.: 150; *Sls. Mgr.:* Alan Feo; *Dist. Mgr.:* Alan Feo

SABRE COMMUNICATIONS CORP., 3400 Hwy 75 N., P.O. Box 536, Sioux City, IA 51102, Tel: 712-258-6690, FAX: 712-258-8250; FSC No.: 60348; *Sls. Mgr.:* Jerry W. Audus; *Dist. Mgr.:* Richard Krone

SABRITEC, 1733 Kaiser Ave., Irvine, CA 92714, Tel: 714-660-1970, TELEX: 678401, FAX: 714-660-9136; FSC No.: 58795; Empl.: 49

SAFE POWER SYSTEMS, Acme Electric Corporation, 528 W. 21st St., Tempe, AZ 85282, Tel: 602-894-6864, FAX: 602-921-0470; *Sls. Mgr.:* Rod Pullen; *Dist. Mgr.:* Jim Heidenreich

SAFT AMERICA INC., Box 1886, Valdosta, GA 31601, Tel: 912-247-2331, TELEX: 547620, TWX: 810-786-5866, FAX: 912-247-6680 ..... **D•1520-1525**

SAFT AMERICA INC., 107 Beaver Ct., Cockeysville, MD 21030, Tel: 301-771-3200, TWX: 710-862-2637 ..... **D•1446**

Local Sales Offices & Reps

CA	Chatsworth, Mike Murphy, Zone Mgr.	818-998-0626
CA	Grenada Hills, Don Sandler	818-360-1853
CA	Redwood City, John Marciano	415-365-4539
FL	Boca Raton, Vince Malkiewicz	305-395-1535, 800-328-5049
GA	Marietta, Doug Thompson, Zone Mgr.	404-992-6950
IL	Carol Stream, Tom Roberts	312-690-8035
IL	Oak Forest, Dan Misheck, Zone Mgr.	312-687-6690
MA	W. Hanover, Chuck Dare	617-871-0204
MN	Maplewood, George Petrich	612-770-0082
OH	Brownsville, Roy Edgar	216-861-1877
PA	Bensalem, Milton Batley	215-831-9520

Local Distributors

AZ	Tempe, Anjon Entprs.	602-894-1332
CA	Chatsworth, Mil-Com Dist. Inc.	818-998-3111
CA	Mountain View, Energy Sls.	415-969-0800
CA	N. Hollywood, CH & M Entprs.	818-980-7358
CA	San Rafael, Elctrns. Plus	415-457-0466
CO	Englewood, Indl. Elctrns.	303-694-9444
FL	Altamonte Springs, TNR Tech., Inc.	800-346-0601
FL	Ft. Lauderdale, P.A. Intl.	305-566-5799
FL	Hialeah, Pro Battery Specialists	305-944-8800
GA	Decatur, ELS Prods.	800-521-2903,800-334-5066
IL	Downers Grove, Telecomm. Dvcs. (TDI)	800-323-7307,312-971-3460
IL	Rosemont, Advent Elctrns.	312-297-6200
IN	Indianapolis, Advent Elctrns.	317-872-4910
IA	Cedar Rapids, Advent Elctrns.	319-363-0221
MA	Billerica, A. W. Mayer	617-229-2255
MA	Danvers, Generation Elctrns.	617-777-4866
MA	Middleboro, Glynn Elctrns.	617-947-4262
MI	Farmington Hills, Advent Elctrns.	313-477-1650
MN	Minneapolis, D.C. Battery Prods, Inc.	612-721-8547
NM	Albuquerque, Alliance Elctrns.	505-292-3360
NY	Deer Pk., TNR Tech., Inc.	516-242-4800
NY	Rochester, Masline Elctrns.	716-546-5373
NC	Charlotte, Electro Sys., Inc.	704-525-2421
OH	Cincinnati, Schuster Elctrns.	216-425-8134
PA	Bensalem, Avex Elctrns.	215-638-3300
TN	Mt. Juliet, Batteries Unltd.	615-754-8179
TX	Houston, K-Tec (Kent) Elctrns.	713-780-7770
TX	Spring, Battery Pak, Inc.	713-367-9393, 1-800-245-1138
UT	Salt Lake City, Standard Supp. Co.	801-486-3371
VA	Falls Church, Perrott Engrg. Labs, Inc.	703-532-0700
WA	Redmond, Energy Sls. (N.)	206-883-2343

SAFT AMERICA, INC., Portable Battery Division, 711 Industrial Blvd., Valdosta, GA 31601, Tel: 912-247-2331, TELEX: 547-620; Empl.: 1200; *Sls. Mgr.:* Michael Marcoux ..... **D•1446, 1520-1525**

Local Sales Offices & Reps

CA	Chatsworth, SAFT America, Inc.	818-998-0626
CA	Granada Hills, SAFT America, Inc.	818-360-1853
CA	Redwood City, SAFT America Inc.	415-365-4539
FL	Boca Raton, SAFT America, Inc.	305-338-7730
GA	Marietta, SAFT America, Inc.	404-992-6950
IL	Carol Stream, SAFT America, Inc.	312-690-8035
IL	Oak Forest, SAFT America, Inc.	312-687-6690
MA	Hanover, SAFT America, Inc.	617-871-0204
MN	Minneapolis, SAFT America, Inc.	612-770-0082
OH	Columbus, SAFT America, Inc.	216-861-1877
PA	Philadelphia, SAFT America, Inc.	215-831-9520

Local Distributors

AZ	Phoenix, Lynntronics	602-433-0288
CA	Carlsbad, Energy Concepts	619-438-2202
CA	Chatsworth, Mill Comm. Distrs., Inc.	818-998-3111
CA	Mountain View, Energy Sls.	415-969-0800
CA	N. Hollywood, C.H. & M	818-982-3150
CA	San Rafael, Elctrns. Plus	415-457-0466
CO	Englewood, Industrial Elctrns.	303-694-9444
FL	Altamonte Springs, TNR Tech.	407-767-2411
FL	Hialeah, Pro Battery	305-884-4040
GA	Decatur, ELS Prods.	404-981-2288
IL	Downers Grove, Telecomms. Dvcs., Inc.	312-971-3460
IL	Lisle, Jabro Batteries	312-964-9358
MA	Billerica, A. W. Mayer Co., Inc.	617-229-2255
MA	Middleboro, Glynn Elctrns.	508-947-4262
MI	Livonia, R. S. Elctrns.	313-525-1155
MN	St Louis, D. C. Battery Prods. Inc,	612-646-7478
NM	Albuquerque, Alliance Elctrns., Inc.	505-292-3360
NY	Deer Park, TNR Tech., Inc.	516-242-4800
NY	Flushing, W & W Assocs.	212-961-2103
NC	Charlotte, Electro Sys., Inc.	704-525-2421
PA	Bensalem, Avex Elctrns. Corp.	215-638-3300
TN	Mt. Juliet, Batteries Unlimited	615-754-8179
TX	Houston, Kent Elctrns.	713-780-7770
TX	Richardson, Kent Elctrns.	214-669-2600
TX	Spring, Battery Pk.	713-367-9393
UT	Salt Lake City, Standard Supp. Co.	801-486-3371
VA	Falls Church, Perrott Engrg. Labs, Inc.	703-532-0700
WA	Redmond, Energy Sls.	206-883-2343

SAGE LABORATORIES, INC., 11 Huron Dr., Natick, MA 01760, Tel: 508-653-0844, TWX: 710-346-0390, FAX: 508-653-5671; FSC No.: 07180; Empl.: 43; *Sls. Mgr.:* Tony Cieri

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FAX: 219-262-8819

SAIA INC., P.O. Box 3030, Elkhart, IN 46515-3030, Tel: 219-262-4418; *Sls. Mgr.:* Keith Scraper; *Dist. Mgr.:* Keith Scraper ..... **B•1300-1301**

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AZ	Tucson, Cornelia Sls. Assocs.	602-577-8706
CA	Alhambra, C.E. Mello Co.	818-282-1405
CA	Milpitas, Maxim Elctrn. Sls.	408-946-6001
IL	Schaumburg, Tech-Tron Sls., Inc.	312-843-7530
IN	Indianapolis, Wilson Tech. Sls.	317-872-2513
MD	Glenarm, Hodgins Assocs.	301-592-7047
MA	Braintree, R.F. Duffy Assocs.	617-848-3550

MN Minneapolis, Holmgren Assocs. 612-786-7641
NY Rochester, Application Specialists 716-586-6226
OK Tulsa, Advance Tech. Sls. 918-664-0482
OR Hillsboro, Temco Northwest 503-645-2030
PA Wayne, Hodgins Assocs. 215-688-9056
TX Dallas, Advance Tech. Sls. 214-340-1300
WA Bothell, Temco Northwest 206-821-5434
Can Scarborough, Ont., Burgess Switch Co. 416-299-0852

SAINT SWITCH, INC., 103 N. 11th Ave.,Box 604, St. Charles, IL 60174, Tel: 312-377-3779, FAX: 312-377-7438; FSC No.: 60198; Empl.: 30

SAMARIUS PRECISION INSTRUMENTS, INC., 300 Seymour Ave., P.O. Box 377, Derby, CT 06418, Tel: 203-735-7405, TWX: 710-451-2495, FAX: 203-732-8975; FSC No.: 18065; Empl.: 40 ..... **A•2143**

Local Sales Offices & Reps
CT Derby, Samarius Precision Instrs., Inc. 203-735-7405

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SAM SUNG ELCTRN. DVCS., America, Inc., 14251 E. Firestone Bl, La Mirada, CA 90638, Tel: 213-802-8425, TWX: 183423 SEDLA; *Sls. Mgr.:* Myung Bang ..... **B•1106-1108**

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S & EI MANUFACTURING, Box 832, Northridge, CA 91324, Tel: 818-349-4111, FAX: 818-349-4651; FSC No.: 24152; Empl.: 40

SANDERS ASSOCIATES, INC., ECBD, A Lockheed Company, 955 Perimeter Rd., Manchester, NH 03108-8500, Tel: 603-645-5548, TWX: 710-220-1845; FSC No.: 31637; Empl.: 760; *Sls. Mgr.:* James Korcuba; *Dist. Mgr.:* James Korcuba

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SANGAMO COMPONENTS DIVISION, Box 128, Pickens, SC 29671, Tel: 803-878-6311, FAX: 803-878-7257; FSC No.: 00853

SAN-O INDUSTRIAL CORP., 85 Orville Dr., Bohemia, NY 11716, Tel: 516-567-5556, TWX: 510-228-7701, FAX: 516-567-5128; Empl.: 50; *Sls. Mgr.:* S. Terry/P. Wernick/A. Konon

SANTA FE TEXTILES, Barcel Wire & Cable, 3151 W. Adams St., Santa Ana, CA 92704-5863, Tel: 714-751-7733, TELEX: 910-595-1959; FSC No.: 31415; Empl.: 20; *Sls. Mgr.:* Mike Ross

SANYO ENERGY CORP., 1201 Sanyo Ave., San Diego, CA 92073, Tel: 619-661-6620, FAX: 619-661-6743; Empl.: 500; *Sls. Mgr.:* Joseph A. Carcone ..... **D•1526**

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CA San Diego, Sanyo Energy 619-661-6620
CO Denver, West Inc. 303-477-8180
FL Gainesville, Sanyo Energy 904-376-6711
IL Bensonville, Sanyo Energy 312-595-5600
CA Santa Clara, ITS 408-727-3406
NJ Little Ferry, Sanyo Energy 201-641-2333
OR Tigard, Rep West 503-639-0325
UT Centerville, West Inc. 801-295-5544
WA Seattle, Rep West 206-283-8351

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CA Escondido, Alexander 619-480-4445
CA Long Bch., Battery Specialists 213-437-1809
CA San Jose, Powell Elctrns. 408-943-9020
CO Denver, Car-Go Battery Co. 303-296-8763
MA Stoughton, Adcour 617-784-8123
NJ Clifton, Engrd. Assemblies 201-340-0600
NC Raleigh, Engrd. Assemblies 919-790-9700
NC Winston-Salem, Progressive Technlgs. 919-761-1375
OR Aloha, Elctrn. Concepts 503-642-9715
PA Philadelphia, Powell Elctrns. 215-365-1900
TX Houston, Kent Elctrns. 713-780-7770
UT Salt Lake City, Stand. Supp. 801-486-3371

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AL Madison, Jack Harvey & Assocs., Inc. 205-461-8591
AZ Tempe, Toribre Entprs. 602-461-9069
CA Burbank, DARCO 818-504-2425
CA Santa Clara, Rymex Int'l. Corp. 408-296-6626
GA Norcross, Jack Harvey & Assocs., Inc. 919-361-5885
IL Park Ridge, Metcom Assocs. Corp. 312-696-1490
IN Indianapolis, Jack Harvey & Assocs., Inc. 317-872-1031
IN Kokomo, Jack Harvey & Assocs., Inc. 317-453-4260
KY Prospect, Jack Harvey & Assocs., Inc. 502-228-4100
MA Marlboro, OK Engrg. Co. 508-481-6400
MI Farmington Hills, Luebbe Sls. Co. 313-489-8828
MN Crystal, Technical Comps. 612-461-9069
MN Crystal, Technical Comps. 612-536-9512
NJ Pompton Lakes, Austin Labs. 201-696-9749
NC Research Triangle Park, Jack Harvey & Assocs., Inc. 919-361-5885
OH Cincinnati, Luebbe Sls. Co. 513-530-0600
PA Montgomeryville, Eastern Sci. Mktg. 215-368-4570
PA Pittsburgh, Luebbe Sls. Co. 412-364-0490
TN Knoxville, Jack Harvey & Assocs., Inc. 615-524-7057
TX Austin, Barry Sls., Inc. 512-837-3616
TX Houston, Barry Sls., Inc. 713-784-5860
TX Richardson, Barry Sls., Inc. 214-234-0255
WA Redmond, Quadra Sls. Corp. 206-883-3550
WI West Allis, Metcom Assocs. Corp. 414-476-1300
Can Don Mills, Ont., Update Elctrns., Inc. 416-447-9101

Local Distributors
NJ Allendale, Sanyo Semiconductor Distbn. 201-818-9070

SAPHIKON, INC., 51 Powers St., Milford, NH 03055, Tel: 603-673-5831, FAX: 603-673-1256; Empl.: 75; *Sls. Mgr.:* Linda Berthiaume

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FAX: 415-856-4732

SARONIX, 151 Laura Lane, Palo Alto, CA 94303, Tel: 415-855-6900, TELEX: 348465; FSC No.: 61441; Empl.: 44; *Sls. Mgr.:* Dean Ransom; *Dist. Mgr.:* Dean Ransom ..... **A•1477-1481**

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AL Huntsville, Electramark, Inc. 205-830-4400
CA Fallbrook, Gary Chilcote Assocs. 619-728-7678
CA Irvine, Saronix 714-955-1220
CO Denver, Lindberg Co. 303-758-9033
FL Altamonte Springs, Sls. Engrg. Concepts 305-682-4800
FL Deerfield Beach, Sls. Engrg. Concepts 305-426-4601
FL St. Petersburg, Sls. Engrg. Concepts Inc. 813-823-6221
GA Norcross, Electramark, Inc. 404-446-7915
GA Snellville, J & B Sls., Inc. 404-985-1940
IL Elk Grove Vl, Parcom, Inc. 312-228-6360
IN Kokomo, Schillinger Assocs., Inc. 317-455-2708
KS Kansas City, BC Elctrn. Sls., Inc. 913-342-1211
KS Wichita, BC Elctrn. Sls., Inc. 316-722-0104
MA Hingham, Northeast Reps., Inc. 617-749-8700
MA Norwell, Norris Assocs. Inc. 617-659-7988
MI Jenisen, R. C. Nordstrom & Co. 616-457-5762
MI Southfield, R. C. Nordstrom & Co. 313-559-7373
MN Eden Prairie, Stan Clothier Co. 612-944-3456
MO St. Louis, BC Elctrn. Sls. 314-521-6683
NV Reno, Galena Technlg. Grp. 702-786-5030
NJ Cherry Hill, Trinkle Sls. 609-795-4200
NJ Englewood, Harold Gray Assocs. 201-894-0894
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EXP CA, Palo Alto, SaRonix 415-856-6900
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CA San Diego, Deco Elctrns. 619-693-1595
CA San Diego, Southland Comps. 619-578-6630
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IN Indianapolis, MAR Elctrns., Inc. 317-633-6699
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MD Columbia, Aztech Elctrns., Inc. 301-995-6800
MA Wilmington, Northstar Elctrns. 508-657-5155
MI Livonia, R.S. Elctrns. 313-525-1155
MO Maryland Heights, Olive Elctrns. 314-997-7709
MO Maryland Hgts., Chelsea Elctrns./Olive 314-426-4500
NH Atkinson, Astrum Elctrns., Inc. 603-898-3399
NJ Camden, General Radio Supp. Co. 609-964-8383
NJ Whippany, ADI 201-428-0510
NY Hauppauge, Chelsea Elctrns./Fairmont 516-231-3313
NY Mt. Vernon, QAR 914-699-2224
NY Stonybrook, Dove Elctrn. Comps. 516-689-7733

NC Raleigh, Sager/Service Plus 919-850-9550
OH Cincinnati, Schuster Elctrns., Inc. 513-489-1400
OR Portland, Radar Elec. Co. 503-232-3404
OR Tualatin, Moore Elctrns. 503-692-5333
PA McKean, Advacom, Inc. 814-476-7774
TX Richardson, Ewing Elctrns., Inc. 214-231-6725
UT Salt Lake City, Standard Supp. 801-486-3371
WA Seattle, Crystal Solutions 206-782-0889
WA Seattle, Radar Elec. Co. 206-282-2511
WI Milwaukee, Technlg. Sls. Inc. 414-964-5015
Can Downsview, Ont., Westburne Elctrns. 416-635-2980

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Local Sales Offices & Reps

CA Los Angeles, Southern CA Tech. Sls. 818-704-9087
CA San Diego, Qualtronics 619-560-8955
CA San Diego, Qualtronics, Inc. 619-695-0118
CA San Francisco, Fischer Assocs. 408-733-7350
CA Santa Clara, Fisher Assocs. 408-733-7350
CO Broomfield, Sunbird Inds., Inc. 303-460-9199
CO Monument, Sunbird Inds., Inc. 719-481-2900
CT Watertown, The Cygnus Sls. Co., Inc. 203-274-3777
FL Clearwater Beach, Perrott Assocs., Inc. 813-443-5214
FL Orlando, Perrott Assocs., Inc. 407-298-7748
FL West Palm Beach, Perrott Assocs., Inc. 407-790-5722
GA Duluth, Grindinger & Assocs. 404-381-1915
ID Boise, N.R. Schultz Co. 208-377-8686
IL Park Ridge, Metcom Assocs. Corp. 312-696-1490
TX Plano, William Assocs. 214-248-1516
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IA Cedar Rapids, ENSCO-REP, Inc. 319-396-1109
KS Countryside, ENSCO-REP, Inc. 913-384-0840
KS Wichita, ENSCO-REP, Inc. 316-683-1070
MA Woburn, The Cygnus Sls. Co., Inc. 617-935-1395
MN Minneapolis, E P I 612-784-5554
MO Maryland Hgts., ENSCO-REP, Inc. 314-423-3935
NJ Trenton, Murtronic Assocs. 609-394-3737
NY Melville, RF Elctrn. Sls. Co. 516-420-8890
OR Beaverton, N.R. Schultz Co. 503-643-1644
TX Houston, William Assocs. 713-463-1354
TX Plano, William Assocs. 214-424-2804
VT East Hardwick, The Cygnus Sls. Co., Inc. 802-472-6870
WA Bellevue, N.R. Schultz Co. 206-454-0300
WI West Allis, Metcom Assocs., Corp. 414-476-1300
Can Montreal, Solid State Engrg. 514-481-3313

SAWTEK INC., P.O. Box 609501, Orlando, FL 32860-9501, Tel: 407-886-8860, TELEX: 514083, TWX: 810-862-0835; FSC No.: 58068; Empl.: 150

SAYLOR ELECTRONICS INT'L, INC., 1852 N. Mountain St., Carson City, NV 89703, Tel: 702-883-4184; Empl.: 4

S. B. ELECTRONICS, INC., 131 South Main St., Barre, VT 05641, Tel: 802-476-4146, FAX: 802-476-4149; FSC No.: 5910; Empl.: 26; *Sls. Mgr.:* Mark Browning

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Local Sales Offices & Reps

CA 714-250-4141
CA Irvine, Future Elctrns. 714-250-4141

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AL Huntsville, Hall-Mark Elctrns. 205-837-8700
AZ Phoenix, Force Elctrns. 602-437-1060
AZ Phoenix, Future Elctrns. 602-968-7140
AZ Phoenix, Hall-Mark Elctrns. 602-437-1200
CA Chatsworth, Future Elctrns. 818-772-6240
CA Chatsworth, Hall-Mark Elctrns. 818-773-4500
CA El Segundo, Force Elctrns. 213-772-1324
CA San Diego, Future Elctrns. 619-278-5020
CA San Jose, Rose Elctrns. 408-263-9700
CA Tustin, Hall-Mark Elctrns. 714-669-4100
CO Englewood, Hall-Mark 303-790-1662
CT Cheshire, Hall-Mark Elctrns. 203-271-2844
CT Danbury, Heilind Elctrns. 203-797-8600
CT Danbury, Pilgram Elctrns. 203-792-7274
FL Largo, Hall-Mark Elctrns. 813-541-7440
FL Melbourne, Green-Shaw Elctrns. 813-541-7440
FL Orlando, Hall-Mark Elctrns. 305-855-4020
FL Pompano Bch., Hall-Mark Elctrns. 305-971-9280
GA Norcross, Hall-Mark Elctrns. 404-447-8000
IL Rosemont, Advent Elctrns. 312-397-6200
IL Woodale, Hall-Mark Elctrns. 312-860-3800
IN Indianapolis, Advent Elctrns. 317-872-4910
IN Indianapolis, Chelsea Elctrns. 317-253-9065
IN Indianapolis, Hall-Mark Elctrns. 317-872-8875
IA Cedar Rapids, Advent Elctrns. 319-363-0221
KS Lenexa, Hall-Mark Elctrns. 913-888-4747
MD Columbia, Hall-Mark Elctrns. 301-988-9800
MD Jessup, Treeko Sls. 301-470-3300
MA Billerica, Hall-Mark Elctrns. 617-667-0902
MA Milford, Car-Lac Elctrns. 617-478-7797
MA Newton, Greene-Shaw 617-969-8900
MA Wilmington, Heilind Elctrns. 617-657-4870
MI Farmington Hills, Advent Elctrns. 313-477-1650
MI Livonia, Hall-Mark Elctrns. 313-462-1205
MI Livonia, R.S. Elctrns. 313-525-1155
MN Eden Prairie, Hall-Mark Elctrns. 612-941-2600
MN Minneapolis, Indl. Comps. 612-831-2666
MO Earth City, Hall-Mark Elctrns. 314-291-5350
MO St. Louis, Olive Elctrns. 314-426-4500
NJ Cranford, Garden State Elctrns. 201-272-6400
NJ Fairfield, Hall-Mark Elctrns. 201-575-4415
NJ Mt. Laurel, Hall-Mark Elctrns. 609-235-1900
NM Albuquerque, International Elctrns. 505-291-9951
NY Bohemia, Car-Lac Elctrns. 516-567-4200
NY Buffalo, Summit Elctrns. 716-887-2800
NY Fairport, Hall-Mark Elctrns. 716-425-3300
NY Lynbrook, Peerless Radio 516-593-2121
NY Rochester, Summit Elctrns. 716-334-8110
NY Ronkonkoma, Hall-Mark Elctrns. 516-737-0600
NC Raleigh, Hall-Mark Elctrns. 919-872-0712
OH Cleveland, Car-Lac Elctrns. 216-881-0050
OH Solon, Hall-Mark Elctrns. 216-349-4632
OH Worthington, Hall-Mark Elctrns. 614-888-3313
OK Tulsa, Hall-Mark Elctrns. 918-254-6110
OR Beaverton, Rose Elec. Distr. Co. 503-629-9288
PA Essington, Tri-Com 215-521-3080
TX Austin, Hall-Mark Elctrns. 512-258-8848
TX Dallas, Hall-Mark Elctrns. 214-553-4300
TX Dallas, International Elctrns. 214-233-9323
TX Framers Branch, Force ELctrns. 214-247-9955
TX Houston, Force Elctrns. 512-476-2104
TX Houston, Hall-Mark Elctrns. 713-781-6100
UT West valley City, Hall-Mark Elctrns. 801-972-1008
WA Seattle, Hall-Mark Elctrns. 206-547-0415
WI New Berlin, Hall-Mark Elctrns. 414-797-7844
WI Milwaukee, Marsh Elctrns. 414-475-6000

SCANNING DEVICES, INC., 108 Elm St., Waltham, MA 02154, Tel: 617-891-8991; Empl.: 12; *Sls. Mgr.:* David Chanoux

SCHAEFER, INC., Schaefer GmBH, 200 Butterfield Dr., Ashland, MA 01721, Tel: 508-879-8658, ESYLNK: 510-100-3630, FAX: 508-879-8669; Empl.: 60; *Sls. Mgr.:* Richard Sakakeeny

SCHAEVITZ ENGINEERING, 7905 N. Route 130, Pennsauken, NJ 08110-1489, Tel: 609-662-8000, TWX: 710-892-0714; FSC No.: 93190; Empl.: 325; *Sls. Mgr.:* Charles Gaver

SCHAFFNER EMC, INC., Components Division, 825 Lehigh Avenue, Union, NJ 07083, Tel: 201-851-0644, 800-367-5566, TELEX: 685-3444, FAX: 201-467-1330; *Sls. Mgr.:* Ken Schnitzer ..... **A•1672**

Local Sales Offices & Reps

AL Huntsville, Elctrn. Mfrs. Agts. 205-830-4030
AZ Scottsdale, BSE, Inc. 602-483-0373
CA Fallbrook, Gary Chilcote Assoc. 619-728-7678
CA Los Angeles, Universal Comps. 213-641-4255
CA Palo Alto, Mollard Mktg. 415-961-0456
CO Englewood, Delltron Co. 303-741-2122
FL Maitland, Hutto Hawkins Assoc. 407-831-2474
GA Roswell, Elctrn. Mfrs. Agt. 404-992-7240
IL Chicago, BNI Elctrns. 312-775-1717
IN Indianapolis, Mktg. Engrs. Inc. 317-872-5665
IA Marion, A.E.M. Inc. 319-377-1129
KS Lenexa, A.E.M. Inc. 913-888-0022
KY Louisville, Mktg. Engrs. Inc. 502-267-7093
MD Randallstown, Beacon North 703-478-2480
MA Millis, Selmark Assocs. 617-376-2914
MI Holland, Com-Tek Sls. 616-399-7273
MN Mendota Hgts., G-II Sls. 612-454-3086
MO St. Louis, A.E.M. Inc. 314-298-9900
NJ Clifton, R.O.I. Sls. 201-340-1515
NJ Marlton, BGR Assocs. 609-983-1020
NM Albuquerque, BSE Inc. 505-293-2582
NY Great Neck, F & F Metro 516-482-4080
NY Rochester, H. C. Johnson Agys. 716-586-0777
NC Charlotte, Elctrn. Mfrs. Agts. 704-365-0547
NC Raleigh, Elctrn. Mgrs. Agts. 919-846-6888
OH Cleveland, Comps. Inc. 216-243-9200
OK Tulsa, D.J. Sls. 918-663-8155
OR Beaverton, Harry Levinson Co. 503-690-1312
TX Austin, D.J. Sls. 512-258-3002
TX Dallas, D.J. Sls. 214-783-8876
UT Sandy, Delltron Co. 801-942-4678
VA Sterling, Beacon North 703-478-2480
WA Seattle, Harry Levinson Co. 206-382-1300
PR Bayamon, Selmark Assoc. 809-787-2096
Can Ontario, Callbrooke Mktg. 519-848-3810

Local Distributors

AZ Tempe, Acacia/VWR Elec. 602-894-2874
CA Buena Pk., Cypress Elctrns. 213-744-0355
CA Gardena, Cal Switch 213-770-2330
CA Irvine, Acacia 714-666-0834
CA Manhattan Bch., Prime Electro Prods. 213-379-3642
CA San Diego, Acacia 619-565-4365
CA San Diego, Cypress Elctrns. 619-535-0011
CA San Diego, Southland Comps. 619-578-6630
CA San Jose, Rose Elctrns. 408-263-9700
CA Santa Clara, Cypress Elctrns. 408-980-2500
CA Sunnyvale, Acacia 408-745-7200
CO Denver, IEC 303-292-6121
CO Lakewood, Acacia 303-232-2882
CT Bridgeport, Millenium Sls. 203-372-2037
CT Wallingford, Midstate Elctrns. 203-265-9900
FL Pompano Beach, Peerless Radio Corp. 305-973-4141
IL Hoffman Estates, IEC 312-843-2040
IL Schaumburg, QPS Elctrns. 312-884-6620
IN Evansville, Excalibur Entprs. 812-464-0079
MD Columbia, D.K. Elctrns. 301-621-5775
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MA Framingham, Now Elctrns. 508-872-5876
MI Grand Rapids, RM Elctrns. 616-531-9300
MN New Brighton, Chris Elctrns. 612-631-2647
MO St. Charles, Finnigan Elctrns. 314-946-6201
NV Rancho Cordova, Acacia/VWR Elctrns. 916-638-1861
NJ Kenilworth, Federated Purchasers 201-272-0505
NJ Moorestown, Marlac 609-234-4200
NJ Rockaway, Nasco Elctrns. 201-625-7777
NY Rochester, Masline Elctrns. 716-546-5373
NY Ronkonkoma, Baldwin Comps. 516-588-5700
PA McKean, Advacom 814-476-7774
TX Richardson, Comp. Tech. Corp. 214-437-2211
UT Salt Lake City, IEC 801-298-1869
WA Seattle, Kam Elctrns. 206-382-1300
WI Racine, Badger Elctrns. 414-637-1256

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FAX: 201-467-1330

SCHAFFNER EMC, INC., Instr. Div., 825 Lehigh Avenue, Union, NJ 07083, Tel: 201-851-0644, 800-367-5566, TELEX: 685-3444; *Sls. Mgr.:* Albert A. Chiaravallo ..... **D•1343**

Local Sales Offices & Reps

AL Huntsville, BMI 205-881-1136
AZ Phoenix, Barnhill Assoc. 602-955-2955
CA Concord, Microwave Meas. 415-846-0377
CA Pleasanton, Microwave Meas. 415-846-0377
CA Westlake Village, Advanced Prods. Sls. 818-706-8351
CO Englewood, Barnhill Assoc. 303-741-3844
CO Grand Junction, Barnhill Assocs. 303-244-9811
FL Clearwater, BMI 813-796-2378
FL Longwood, BMI 407-332-1940
FL Melbourne, BMI 407-724-8276
GA Atlanta, BMI 404-256-9640
GA Sylvester, BMI 912-776-4100
IL Burr Ridge, PVA Corp. 312-655-3355
IN Fishers, Carter, McCormic & Peirce 317-842-9277
KS Wichita, Dytec/ South Inc. 316-945-7090
MA Burlington, Intersell 617-273-3844
MI Farmington Hills, Carter, McCormick & Peirce 313-477-7700
MN Minneapolis, Loren F. Green/Minn. 612-571-6666
MO Maryland Heights, Dytec/South Inc. 314-739--0665
NJ Milford, Bytec 201-995-7517
NM Albuquerque, Barnhill Assocs. 505-299-7658
NY Syracuse, Labtronics 315-455-7314
NY Wantagh, Bytec 516-781-7400
NC Raleigh, BMI 919-787-0330
OH Berea, Carter McCormic & Peirce 216-826-0400
OH Englewood, Carter, McCormic & Peirce 513-836-0951

OK Tulsa, Barnhill Assocs. 918-744-6535
OR Wilsonville, Syntek 503-682-2750
PA Melrose Park, Robert Meyers Assocs. 215-224-1663
PA Pittsburgh, Carter, McCormic & Peirce 412-826-3800
TX Austin, Barnhill Assocs. 512-343-6448
TX Houston, Barnhill Assocs. 713-444–1733
TX Houston, Barnhill Assocs. 713-776-2382
TX Richardson, Barnhill Assocs. 214-231-2573
TX San Antonio, Barnhill Assocs. 512-694-5575
UT Orem, Barnhill Assocs. 801-226-1239
VA Fairfax, Scientific Assocs. 703-385-0600
WA Bellevue, Syntek 206-462-7700
Can B.C., Jerome & Francis Co. 604-986-1286
Can Ontario, Amos, Mitchell & Assocs. 416-584-2238

SCHAUER MANUFACTURING, 4500 Alpine Ave., Cincinnati, OH 45242, Tel: 513-791-3030, FAX: 513-791-7192; Empl.: 195; *Sls. Mgr.:* A. A. Groenewold; *Dist. Mgr.:* Dan Shaw

SCHENCK PEGASUS CORP., 2890 John R, Troy, MI 48083, Tel: 313-689-9000, TWX: 810-232-1529, FAX: 313-689-8578; Empl.: 130; *Sls. Mgr.:* David Sallberg

SCHLAGE ELECTRONICS, 5452 Betsy Ross Drive, Santa Clara, CA 95054-1102, Tel: 408-727-5170, FAX: 408-727-6707; Empl.: 200

SCHLEGEL CORP., P.O. Box 23197, Rochester, NY 14692, Tel: 716-427-7200, TELEX: 6854121, FAX: 716-427-9993; Empl.: 250; *Sls. Mgr.:* Jay C. Metzler ..... **C•1747**

SCHLUMBERGER INSTRUMENTS, Schlumberger Technologies, 20 North Avenue, Burlington, MA 01803, Tel: 617-229-4825, FAX: 617-229-4885; FSC No.: 1T316; Empl.: 50; *Sls. Mgr.:* Al Prosuk

SCHONSTEDT INSTRUMENT CO., 1775 Wiehle Ave., Reston, VA 22090, Tel: 703-471-1050, TWX: 710-833-9880; Empl.: 45

SCHOTT CORP., 1000 Parkers Lk. Rd., Wayzata, MN 55391, Tel: 612-475-1173, TWX: 910-576-2964; FSC No.: 80023; Empl.: 325; *Sls. Mgr.:* A. Schmitt

Local Sales Offices & Reps
MA Needham, Hatch Assocs. 617-963-3306

SCHOTT ELECTRONICS, 42 Silvermine Road, Seymour, CT 06483, Tel: 203-881-0102, TWX: 710-451-8911, FAX: 203-881-0098; Empl.: 150; *Sls. Mgr.:* Ross Wieringa

SCHOTT GLASS TECHNOLOGIES, INC., 400 York Ave., Duryea, PA 18642, Tel: 717-457-7485, TWX: 510-671-4535, FAX: 717-457-6960; FSC No.: 23-169-1403; Empl.: 500; *Sls. Mgr.:* D.J. Dougherty

SCHRACK NORTH AMERICA CORP., 1995 Pond Rd., Ronkonkoma, NY 11779-7209, Tel: 516-737-0099, FAX: 516-737-2550; Empl.: 10; *Sls. Mgr.:* John Walsh; *Dist. Mgr.:* James Amor ..... **B•1616-1622**

Local Sales Offices & Reps
AL Huntsville, DHR Mktg. 205-533-5165
AZ Glendale, Aspen Power 602-931-9289
CA Arcadia, Van Gott & Assocs. 818-445-9728
CA Santa Rosa, Cummings & Assocs. North 408-247-8656
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FL Miami, Omnitron 305-448-0050

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IL Elk Grove Vl, Oasis Sls. Corp. 312-640-1850
IN Indianapolis, C.C. Elctrns. 317-255-1508
MO Hazelwood, Acorn Elctrns. 314-731-2002
MA Lexington, Hathaway Elec. 617-861-7010
MN Roseville, TLC 612-483-2226
NJ Lawrenceville, DVS Co. 609-896-1112
NJ Westwood, Jarms 201-666-9390
NY Liverpool, Malcom M. Hare 315-457-6859
NC Raleigh, DHR 919-781-1961
SC Greenville, DHR Mktg. 803-235-3594
WA Bellevue, Caruso & Co. 206-454-1261
Can St. Laurent, Electromatic Comps. Ltd. 514-337-1104

Local Distributors
AZ Tempe, Control Des. Supp. 602-829-7981
CA City of Industry, ITAL 818-968-8515
CA San Rafael, Elctrns. Plus 415-457-0466
CO Denver, CSID 303-292-9594
CT Middlefield, Control Des. Supp. 203-349-0200
FL Ft. Lauderdale, Southeastern Elctrns. 305-563-4131
FL Opa Locka, Baron Elctrn. Sls. 305-685-1400
GA Stone Mountain, Control Des. Supp. 404-979-3500
ID Boise, Bolen's Control House 208-363-5280
IL Carol Stream, Lectro Comps. 312-690-0520
IN Indianapolis, Control Des. Supp. 317-788-4559
IA Marion, Control Des. Supp. 319-373-2923
KS Kansas City, Control Des. Supp. 913-362-4248
ME Gray, Longhill Electro. Tech. 207-657-2183
MA Norwood, Emtel 617-769-9500
MN Minneapolis, Control Des. Supp. 612-721-1628
MO St. Louis, Control Des. Supp. 314-426-3150
NJ Lodi, Nidisco 201-773-1771
NJ Paramus, Electro Control Supp. 201-836-2112
NJ Pennsauken, IMS Distbn. 609-662-1770
NC Pineville, Control Des. Supp. 704-588-4410
OR Portland, O4 Controls, Inc. 503-231-8058
PA Malvern, Control Des. Supp. 215-296-0150
TX Dallas, Control Des. Supp. 214-358-1441
WA Seattle, Stusser Elec. Co. 206-624-8770

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SCHROFF INCORPORATED, Schroff GMBH, 170 Commerce Dr., Warwick, RI 02886, Tel: 401-732-3770, TELEX: 952175; Empl.: 75; *Sls. Mgr.:* Samuel Hopp ..... **C•1091**

Local Sales Offices & Reps
AL Huntsville, 20th Century Mktg., Inc. 205-933-9281
AZ Scottsdale, Luscombe Engr. 602-949-9333
CA Los Gatos, Luscombe Engrg. 408-370-2020
CA Pasadena, Luscombe Engr. 213-684-2000
CA San Diego, Luscombe Engr. 619-549-9699
CO Longmont, Luscombe Engrg. 303-772-3342
FL Altamont Springs, Carter Assocs. 305-671-6800
GA Norcross, 20th Century Mktg., Inc. 404-446-1999
IL Hillside, Cadre Tech. Rep. 312-449-3900
IA Marion, MSB Assocs. 319-377-6261
KS Roeland Park, MSB Assocs. 913-432-2131
MD Baltimore, Miller & Dietz Co. 215-647-7373
MI Troy, C. B. Jensen 313-643-0506
MN Minneapolis, D. A. Case Assoc. 612-869-3700
MO St. Charles, MSB Assocs. 314-946-5577
NH Salem, Sales Engr. 603-893-5521
NJ Englewood, Sprung-Nussbaum 201-569-5666
NY Clifton Park, Bastian Sls. 518-452-2026
NY E. Syracuse, Bastian Sls. 315-437-1482
NY Fairport, Bastian Sls. 716-223-0237
NC Cary, 20th Century Mktg., Inc. 919-481-3370
OH Aurora, EMA 216-562-6104
OH Centerville, EMA 513-433-2800
OR Tigard, Elctrn. Comps. Sls. 503-245-2342
PA Huntington Valley, Omega Elctrn. Sls. 215-947-4135
TN Knoxville, 20th Century Mktg., Inc. 615-966-2099
TX Garland, CMZ 214-681-1414
WA Mercer Island, Elctrn. Comp. Sls. 206-232-9301

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SCHURTER, INC., 1016 Clegg Ct., Petaluma, CA 94952, Tel: 707-778-6311, TELEX: 176-084; FSC No.: 61935; *Sls. Mgr.:* Bruno H. Schurter ..... **A•1670-1671; B•1408, 1835; C•1520-1523**

Local Sales Offices & Reps
AL Athens, Effective Mktg. Force 205-233-2947
AZ Scottsdale, Elctrns. Tech. Sls. Assocs., Inc. 602-941-9137
AR Little Rock, Doby Assoc. 501-221-0326
CA Fullerton, Gru Assocs. 213-691-2993
CA Moraga, Ruppert Sls. & Engrg. 415-376-8040
CA San Jose, Ruppert Sls. & Engrg. 408-998-8717
CO Lakewood, Cristee-Meade Co. 303-232-0287
FL Pompano, IMR, Inc. 305-942-2449
GA Lawrenceville, Effective Mktg. Force .. 404-925-2060
GA Lithia Springs, Effective Mktg. Force .. 404-948-4209
IL Arlington Hgts., MJ Petersen & Assoc., Ltd. 312-577-8200
IN Carmel, Newton & Assocs. 317-848-2016
MN Minnetonka, Frank Anthony Mktg. 612-934-0773
MS Jackson, Doby Assocs. 601-981-1138
NH Nashua, Bell Controls 603-882-6984
NJ Ho-Ho-Kus, D. J. Fisher Co. 201-652-0090
NJ Medford, Champion Elctrn. Sls. Co. 609-983-0932
NY Fairport, TAC Sls, Inc. 716-425-1070
NC Lillington, Effective Mktg. Force 919-893-9650
OH Beachwood, Electronic Salesmasters 216-831-9555
OR Portland, Westmark 503-641-8780
TX Dallas, Reese & Assocs. 214-351-0703
WA Seattle, Westmark 206-281-4025

Local Distributors
CA Scotts Valley, Quail Elctrns. 408-354-3643
CA Sunnyvale, Target Elctrns., Inc. 408-734-5611
IL Elk Grove Village, Nu-Way Elctrn. Distrbs. Inc. 312-437-7120
MD Rockville, FIC Corp. 800-638-6594
MA Wilmington, JV ELctrns. 617-657-6523
OH Strongsville, Fuse World 216-238-1330
OR Tualatin, Moore Elctrns., Inc. 503-692-5333
TX Dallas, Fuses, Inc. 214-341-6407
Can Markham, Ont., Birde Mktg. 416-477-7722

SCHUSTER ELECTRONICS, 8 Beattie Court, Huntington, NY 11530, Tel: 516-271-0590; *Sls. Mgr.:* Max Schuster

SCIENCE ACCESSORIES CORP., 200 Watson Blvd., Stratford, CT 06497, Tel: 203-386-9978, TELEX: 964300 SAC SPRT, FAX: 203-381-9270; Empl.: 40; *Sls. Mgr.:* H. A. Cleveland

SCIENCE & ENGRG. CONSULTANTS, INC., 11800 Sunrise Valley Dr., Ste. 300, Reston, VA 22091, Tel: 703-860-0600, FAX: 703-281-9778; Empl.: 2; *Sls. Mgr.:* Dr. Joseph T. Siewick

SCIENCE/ELECTRONICS, P. O. Box 986, Dayton, OH 45401-0986, Tel: 513-859-5555, FAX: 513-859-7930; Empl.: 25; *Sls. Mgr.:* E. E. Pohl; *Dist. Mgr.:* J. Tanksley

SCIENTECH, INC., 5649 Arapahoe Ave., Boulder, CO 80303, Tel: 303-444-1361, 800-525-0522, TWX: 910-940-0994, FAX: 303-444-9229; Empl.: 35

SCIENTIFIC-ATLANTA, INC., See Optima Enclosures

SCIENTIFIC COLUMBUS, INC., Esterline Corporation, 1900 Arlingate Lane, Columbus, OH 43223, Tel: 614-274-0400, TELEX: 245-426, FAX: 614-272-2288; *Sls. Mgr.:* Donald M. Yore

SCIENTIFIC COMMUNICATIONS, INC., 3425 Kingsley Rd., Garland, TX 75041, Tel: 214-271-3685, TWX: 910-860-5172; *Sls. Mgr.:* Donald G. Luiken

SCIENTIFIC RESEARCH CORP., See TRAK Microwave Corp.

SCIENTIFIC TECHNOLOGIES, Optical Sensor Div. Inc., 31069 Genstar Rd., Hayward, CA 94544, Tel: 415-471-9717, TELEX: 34-5506, FAX: 415-471-9752; Empl.: 100

SCITEQ ELECTRONICS, INC., 8401 Aero Dr., San Diego, CA 92123, Tel: 619-292-0500, TELEX: 882008, FAX: 619-292-9120; FSC No.: 70561; Empl.: 35; *Sls. Mgr.:* Phil Feinberg

SCOPE INCORPORATED, 1860 Michael Faraday Dr., Reston, VA 22090, Tel: 703-471-5600, TWX: 710-883-1178; Empl.: 260; *Sls. Mgr.:* Robert W. Griffin, Sls. Mgr. VP

SCREEN DATA CORP., 65 Elm St., Dover, NJ 07801, Tel: 201-887-7713, 800-248-1212, TELEX: 710-387-209, FAX: 201-633-7119

SC TECHNOLOGY, INC., 2450 Armstrong St., Livermore, CA 94550, Tel: 415-373-9230, FAX: 415-373-9416; *Sls. Mgr.:* Susan L. Karl

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NY	Rochester, Upstate Engrg. Sls.	716-225-2383
NC	New Hill, Tom Santel Assocs.	919-362-4091
OH	Powell, Val-Skol Sls.	614-889-0174
OH	Willoughby, Val-Skol Sls.	216-942-6021
OK	Tulsa, Encore Technlg. Co.	918-665-3562
PA	King of Prussia, Freedman-Malta Assocs.	215-337-9211
SC	Mauldin, Carl Hart Assocs.	803-288-2323
TX	Richardson, Encore Technlg. Co.	214-669-0232
TX	Round Rock, Encore Technlg. Co.	512-388-7930
WI	Brookfield, Heartland Tech. Mktg.	414-796-1128

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CA	Garden Grove, Natl. Cap. Supp.	714-892-7744
CA	San Jose, Compass Comps.	408-432-7575
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MN	Fridley, Voyager Elctrns.	612-571-7766
NH	Hudson, T.N.T.	603-880-8300
NJ	E. Brunswick, Brothers Elctrns.	201-238-2200
NY	Farmingdale, Pride Elctrns.	516-293-4020
NY	Hauppauge, Jaco Elctrns.	516-273-5500
NY	Melville, S.A.I.	516-293-2710
NY	Ronkonkoma, Spectrum Comp.	516-737-6900
TX	Dallas, Off-the-Shelf Comps.	214-238-0808
TX	Ft. Worth, C & W Supp.	817-831-0395
TX	Richardson, G.T.T. Elctrns.	214-234-1555
WA	Seattle, Vesco Elctrns.	206-575-3607

SEA DATA, INC., One Bridge St, Newton, MA 02158, Tel: 617-244-8191, TELEX: 951107; Empl.: 30; *Sls. Mgr.:* D. Crouse

SEAFAB, INC., 14648 N.E. 95th St, Redmond, WA 98052, Tel: 206-881-2778, FAX: 206-882-0707; Empl.: 80; *Sls. Mgr.:* Bruce Murray

SEALTRON, INC., 9705 Reading Road, Cincinnati, OH 45215, Tel: 513-733-8400, FAX: 513-733-0131; Empl.: 140; *Sls. Mgr.:* James Dawson

SEASTROM MANUFACTURING CO., INC., 701 Sonora Ave., Glendale, CA 91201, Tel: 213-245-9121, FAX: 818-246-6803; FSC No.: 86928; Empl.: 75; *Sls. Mgr.:* Bob Seastrom

SEATTLE AIRCRAFT BEARINGS, 2835 82nd Ave. S.E., P.O. Box 20, Mercer Island, WA 98040, Tel: 206-232-4800, TWX: 910-444-4126, FAX: 206-236-5480; Empl.: 40; *Sls. Mgr.:* Jim Innes ..... **C•1686-1688**

Local Sales Offices & Reps

CA	San Diego, Mechatronics SAB	619-944-1184
CA	San Jose, SAB Mechatronics	415-829-4014
FL	Miami Lakes, Mechatronics SAB	305-822-5823
TX	Dallas, SAB Mechatronics	817-488-6634
NH	Nashua, SAB Mechatronics	603-888-3054

SECTOR MICROWAVE IND. INC., 999 Grand Blvd., Deer Park, NY 11729, Tel: 516-242-2300, TWX: 510-227-6075, FAX: 516-242-8158; Empl.: 40; *Sls. Mgr.:* Thomas Nelson

SECURITY PLASTICS, INC., 14427 N.W. 60th Ave., Miami Lakes, FL 33014, Tel: 305-823-5440, FAX: 305-557-1431; Empl.: 400; *Sls. Mgr.:* Nelson Rodriguez

SEEQ TECHNOLOGY, 1849 Fortune Dr., San Jose, CA 95131, Tel: 408-432-7400, 1-800-3EEPROM, TELEX: 296609, TWX: 9103382313, FAX: 408-432-9549; Empl.: 530; *Sls. Mgr.:* Phil Ortiz, V.P Worldwide Sls.; *Dist. Mgr.:* Carolyn Troland

Seiko Instruments

FAX: 213-517-7792

SEIKO INSTRUMENTS U.S.A., INC., Components Div., 2990 W. Lomita Blvd., Torrance, CA 90505, Tel: 213-517-7770; *Sls. Mgr.:* David Brooks; *Dist. Mgr.:* Lee Guio ..... **A•1483; B•1109; D•1110**

Local Sales Offices & Reps

AL	Huntsville, Electro-Mech	205-880-0592
AZ	Scottsdale, Fred Board Assocs.	602-994-9388
AZ	Tucson, Fred Board Assocs.	602-299-1508
CA	Irvine, Groh Assoc.	714-837-9871, 619-696-0054
CA	San Diego, Groh Assocs.	619-453-7572
CA	San Jose, Exis, Inc.	408-433-3047
CO	Aurora, Electrodyne	303-695-8903
CT	Madison, Focus Elctrn. Sls.	203-245-4314
FL	Plantation, Gallagher & Assocs.	305-473-2101
GA	Norcross, Electro-Mech	404-447-6478
IL	Elk Grove Village, TriStar Grp., Inc.	312-593-0200
IN	Ft. Wayne, Electro Rep Inc.	219-484-2682
IN	Indianapolis, Electro Rep Inc.	317-842-7202
IA	Cedar Rapids, J.R. Sls. Engrg., Inc.	319-393-2232
KS	Overland Park, Electri-Rep	913-649-2168
MI	Grand Rapids, R.P. Urban & Assoc.	616-245-0511
MD	Middleton, S. T. Woolard Co.	301-371-4500
MA	Taunton, Focus Elctrns. Sls.	508-824-3840
MI	Detroit, R.P. Urban & Assoc.	313-535-2355
MN	St. Paul, Stan Clothier Co.	612-944-3456
MO	St. Louis, Electri-Rep	314-993-4421
NM	Albuquerque, Fred Board Assocs.	505-888-1121
NY	Cazenovia, S.I. Woolard Co.	315-655-6145
NY	E. Syracuse, Nycom, Inc.	315-437-8343
NC	Raleigh, Electo-Mech	919-790-9300
NC	Raleigh, Electro-Mech	919-790-9300
OH	Brunswick, J. N. Bailey & Assocs.	216-273-3798
OH	Columbus, J. N. Bailey & Assocs.	614-262-7274
OH	New Lebanon, J. N. Bailey & Assocs.	513-687-1325
OR	Tigard, Electronic Comp. Sls.	503-245-2342
PA	Frazer, Industrial Comps., Inc.	215-889-0650
TN	Jonesboro, Electro-Mech	615-753-2964
TX	Austin, TL Mktg.	512-467-7370
TX	Dallas, TL Mktg.	214-484-6800
TX	Houston, TL Mktg. Inc.	713-589-2763
UT	Salt Lake City, Electrodyne	801-264-8050
WA	Mercer Island, Electronic Comp. Sls.	206-232-9301
WA	Spokane, Electronic Comp. Sls.	509-456-0100
WI	Brookfield, TriStar Grp., Inc.	414-782-2670

Local Distributors

AZ	Phoenix, Aerospace S.W.	602-582-2779
AZ	Phoenix, Sterling Elctrns.	602-268-2121
CA	Agoura Hills, Pacesetter Elctrns.	818-991-3984
CA	Anaheim, Pacesetter Elctrns.	714-779-5855
CA	Irvine, OBI	714-250-9003
CA	Mountain View, I/O Sls.	415-968-1080
CA	Oakland, Paragon Sys. Inc.	415-452-1024
CA	Reseda, Jan Dvcs.	818-708-1100
CA	San Diego, Added Value Elctrns.	619-792-0251
CA	San Diego, Neumann Elctrns.	619-695-3005
CA	San Jose, Pacesetter Elctrns.	408-436-8822
CA	Sunnyvale, Pacesetter Elctrns. USA	408-734-5470
CA	Tustin, Added Value Elctrns.	714-259-8258
CA	West Lake Village, Added Value Elctrns.	818-889-2861
CO	Englewood, Sterling Elctrns.	303-792-3939
CT	Wallingford, Sterling Elctrns.	203-265-9535
FL	Melbourne, Greene-Shaw Co. Inc.	407-951-3636
FL	Tampa, Lectro Distrs.	813-960-1631
ID	Boise, Radar Elec.	208-336-2227
IL	Northbrook, Classic Comps.	312-272-9650
IN	Indianapolis, RM Elctrns.	317-291-7110
IA	Cedar Rapids, Dee Elctrns., Inc.	319-365-7551
KS	Lenexa, Sterling Elctrns.	913-492-5406
LA	West Wego, Sterling Elctrns.	504-436-1418
MD	Middletown, Current Comps.	301-473-5333
MA	Norwood, Emtel	617-769-9500
MA	Sharon, Adcour	617-784-8123
MA	Woburn, Sterling Elctrns.	617-938-6200
MI	Grand Rapids, RM Elctrns.	616-531-9300
MN	Minneapolis, Aerospace Computer Supps.	612-884-4725
MN	Minneapolis, Sterling Elctrns.	612-831-2666
NJ	S. Plainfield, Sterling Elctrns.	201-769-7000
NM	Albuquerque, Sterling Elctrns.	505-884-1905
NY	E. Syracuse, Add Elctrns.	315-437-0300
NY	Hewlett, Metropolitan Sls.	516-599-7900
NY	Mt. Vernon, QAR Elctrns.	914-699-2224
NY	Victor, Add Elctrns.	716-924-4760
OH	Cincinnati, Schuster Elctrns.	513-489-1400
OK	Tulsa, Sterling Elctrns.	918-663-2410
OR	Portland, Radar Elec./Porland	503-232-3404
OR	Tualatin, Moore Elctrns.	503-692-5333
PA	Exton, VSH Elctrns.	215-363-2250
PA	Pittsburgh, CAM/RPC Elctrns.	412-782-3770
PA	Wayne, Peak Elctrns.	215-293-9000
TX	Austin, Sterling Elctrns.	512-836-1341
TX	Dallas, Sterling Elctrns.	214-243-1600
TX	Houston, Sterling Elctrns.	713-627-9800
UT	West Valley City, Added Value	801-975-0245
VA	Herndon, Sterling Elctrns.	703-742-8400
WA	Richland, Radar Elec.	509-943-8336
WA	Seattle, Radar Elec.	206-282-2511
WA	Spokane, Radar Elec.	509-747-3053
WI	New Berlin, Classic Comps.	414-786-5300
CO	Wheatridge, Added Value Elctrns.	303-422-1701
Can	Burnaby, B.C., ITT/RAE Multicomps.	604-291-8866
Can	Concord, Ont., ITT Multicomps.	416-736-1144
Can	Markham, Ont., Semad Elctrns./DEW Elctrns.	416-475-8500

SEIKO INSTRUMENTS U.S.A., INC., Robotics/Automation Div., 2990 W. Lomita Blvd., Torrance, CA 90505, Tel: 213-517-7850, FAX: 213-517-7792; *Sls. Mgr.:* K. Curtis

SEKAI ELECTRONICS OF AMERICA, INC., 14700 E. Firestone Blvd., Suite 122, La Mirada, CA 90638, Tel: 714-670-1854, TELEX: 882756, FAX: 714-670-1855; FSC No.: 8V398; Empl.: 6; *Sls. Mgr.:* Larry Klementowski

selco

FAX: 714-739-1507

SELCO PRODUCTS CO., SEL Sales, Inc., 7580 Stage Rd., Buena Park, CA 90621, Tel: 714-521-8673, TELEX: 65-5457; Empl.: 18; *Sls. Mgr.:* Bill Wilkinson; *Dist. Mgr.:* Bill Keneipp ..... **B•1917; C•1614**

Local Sales Offices & Reps

AR	Hot Springs, ASI	501-767-5444
CA	Arcadia, HMC, Inc.	818-447-0958
CA	La Mesa, Summit Sls.	619-697-0646
CA	Sunnyvale, Pass Assocs.	408-735-9040
IL	Elk Grove Vl, Parcom Inc.	312-228-6360
MA	Andover, Crawford Assocs.	617-470-2122
MS	Horn Lake, ASI	601-342-4989
NY	Naples, LMS Sls. Assoc.	716-374-2626
OR	Beaverton, Luscombe Engrg.	503-636-6664
PA	Hatboro, J. S. Wurts Co.	215-674-3562
TX	Dallas, Titan- Hill Co.	214-241-1398
WA	Bellevue, Luscombe Engrg.	206-223-1541

Local Distributors

CA	Arcadia, Parco	818-447-0958
IL	Wheeling, Hawk Elctrns.	312-459-4091
MA	Andover, Crawford Assocs.	617-470-2122
NY	New York City, Martin Audio/Video	212-541-5900

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SEL-REX DIV., OMI Intl. Corp., 75 River Rd., Nutley, NJ 07110, Tel: 201-667-5200, TELEX: 133-320, TWX: 710-989-1423; Empl.: 250; *Sls. Mgr.:* R. Berg

SEMICOA, 333 McCormick Ave., Costa Mesa, CA 92626, Tel: 714-979-1900, TELEX: 678-315, TWX: 910-595-1961, FAX: 714-557-4541; FSC No.: 34156; Empl.: 85; *Sls. Mgr.:* M. Gregson

SEMICON COMPONENTS, INC., Div. of Semicon, Inc., 10 North Ave., Burlington, MA 01803, Tel: 617-272-9015, TWX: 710-332-1919; Empl.: 300; *Sls. Mgr.:* Jack Lawrence

SEMICONDUCTOR CIRCIUTS, INC., Emerson Electric, Co., 49 Range Rd., Windham, NH 03087, Tel: 603-893-2330, FAX: 603-893-6280; Empl.: 100; *Sls. Mgr.:* Dale Raveney, VP Mktg. & Sls.

SEMICONDUCTOR PACKAGING MATERIALS CO., 431 Fayette Ave., Mamaroneck, NY 10543, Tel: 914-698-5353, ESYLNK: 910-380-9209, FAX: 914-698-5386; Empl.: 30

SEMICONDUCTOR TECHNOLOGY, INC., 3131 S.E. Jay St., Stuart, FL 34997, Tel: 407-283-4500, TWX: 510-953-7511, FAX: 407-286-8914; FSC No.: 50891; Empl.: 45

Local Sales Offices & Reps

AZ	Scottsdale, Fred Board Assocs.	602-994-9388
CA	Costa Mesa, Solid State Sls.	714-650-8414
CA	Mountain View, Leddy Assocs.	415-969-6313
CO	Englewood, Comp. Sls.	303-779-8060
FL	Altamonte Springs, APM Assoc.	305-869-6831
FL	Ft. Lauderdale, APM Assoc.	305-565-0056
FL	Tampa, APM Assoc.	813-886-2457
IL	Downers Grove, Splon Assocs.	312-665-5993
IA	Cedar Rapids, Lorenz Sls.	319-377-4666
KS	Overland Pk., Lorenz Sls.	913-649-5556
MD	Towson, Arbotek	301-825-0775
MA	Burlington, Conti-Younger	617-273-1582
MN	Minneapolis, Bill Deming & Assocs.	612-888-5000
MO	Bridgeton, Lorenz Sls.	314-298-8585
NE	Lincoln, Lorenz Sls.	402-475-4660
NJ	Hasbrouck Heights, Comp Tech Sls.	201-288-7400
NY	New Hyde Park, Comp Tech Sls.	516-593-2628
NY	Syracuse, Electra Sls.	315-463-1248
OH	Vandalia, Cleary Sls.	513-890-8642
OR	Portland, Index Inc.	503-297-3364
PA	Paoli, Stitzer Assocs.	215-644-5500
TX	Dallas, M-Rep	214-484-5711
UT	Salt Lake City, Component Sls.	801-268-8440

SEMIKRON, INC., 11E Executive Dr., P.O. Box 66, Hudson, NH 03051-0066, Tel: 603-883-8102, 1-800-258-1308, TELEX: 6711011, FAX: 603-883-8021; FSC No.: 58687; Empl.: 60; *Sls. Mgr.:* Frank Haase; *Dist. Mgr.:* John Flannery

SEMTECH, 652 Mitchell Rd., Newbury Park, CA 91320, Tel: 805-498-2111, TWX: 910-336-1264; FSC No.: 14099;Multiple; Empl.: 200; *Sls. Mgr.:* John Pennant-Jones; *Dist. Mgr.:* Bita Esfandiar

SEMTRONICS CORP., 211 Prospect Pk., P.O. Box 2248, Peachtree City, GA 30269, Tel: 404-487-6681, TELEX: 8107662244, FAX: 404-487-1128; Empl.: 30; *Sls. Mgr.:* Sue Heise

SENCORE, 3200 Sencore Dr., Sioux Falls, SD 57107, Tel: 605-339-0100, 800-843-3338, TWX: 910-660-0300, FAX: 605-335-6379; FSC No.: 33347; Empl.: 250; *Sls. Mgr.:* Doug Bowden

SENIOR INDS., INC., 610 Pond Dr., Wood Dale, IL 60191, Tel: 312-350-1600, FAX: 312-350-1654

SENSALL, Rosemount Corp., 250 Marcus Blvd., Hauppauge, NY 11788, Tel: 516-273-6600, TELEX: 14-4545, FAX: 516-273-6651; Empl.: 140; *Sls. Mgr.:* V. McCormack

SENSITEK CORPORATION, See Biddle Instruments

Sensitive Research
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FAX: 914-699-9410

SENSITIVE RESEARCH INSTRUMENTS, 25 Dock St., Mt. Vernon, NY 10550, Tel: 914-699-9717; FSC No.: 32590;16034A; Empl.: 35 ..... **D•1344-1345**

Local Sales Offices & Reps

AZ	Scottsdale, Williams Assocs.	602-947-4297
CO	Commerce City, Williams Assocs.	303-289-5647
DC	Washington, Whitcomb Assocs.	202-737-0763
IL	Lincolnwood, Saffro & Assocs.	312-677-9722
LA	Metairie, Data Mktg. Assocs.	504-833-3655
MA	Lexington, Zieco	617-861-8300
MI	Southfield, Comtel Instrs. Co.	313-358-2505
MN	Minneapolis, Hei-Lite Sls.	612-861-6051
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Mount Vernon, Elctrl. Instr. Svc.	914-699-9717
OH	Cleveland, Comtel Instrs. Co.	216-442-8080
OH	Dayton, Comtel Instrs. Co.	513-426-5310
OH	Hilliard, Comtel Instrs. Co.	614-876-8305
OK	Tulsa, Data Mktg. Assocs.	918-494-2711
PA	Pittsburgh, Comtel Instrs. Co.	412-922-5720
TX	Austin, Data Mktg. Assocs.	512-443-7722
TX	Dallas, Data Mktg. Assocs.	214-661-0300
TX	Houston, Data Mktg. Assocs.	713-954-5020
TX	San Antonio, Data Mktg. Assocs.	512-342-3031
UT	Salt Lake City, Data Mktg. Assocs.	801-485-6511
WI	Lake Mills, Saffro & Assocs.	1-800-327-0312

SENSORAY CORP., 44160 Old Warm Springs Blvd., Fremont, CA 94538, Tel: 415-657-7290; Empl.: 6; *Sls. Mgr.:* Richard Soundy

Local Distributors

SC	Greer, CDI	803-877-8700

SENSOR CORP., Box 140, Scottdale, PA 15683, Tel: 412-887-4080, FAX: 412-887-0383; Empl.: 6

Sensor Scientific, inc.

FAX: 201-227-8063

SENSOR SCIENTIFIC, INC., 6 Kingsbridge Rd., Fairfield, NJ 07006, Tel: 201-227-7790, 800-524-1610; Empl.: 100; *Sls. Mgr.:* Carol Dunbar ..... **B•1918-1919**

Local Sales Offices & Reps

CA	Belmont, Ken Stroube Assoc.	415-593-4137
CA	Irvine, Vale Elctrn. Assoc.	714-551-4004
CA	San Diego, Vale Elctrns.	619-693-0113
CA	Saratoga, Mead Advantage	408-741-5300
CA	Van Nuys, Vale Elctrns.	818-705-0283
CO	Ft. Collins, Rep. Sls.	303-226-1504
FL	Hollywood, Askland Elctrn. Corp.	305-987-1074
IL	Des Plaines, ESCO Assocs.	312-298-5310
MA	Lexington, Jodan Technlg.	617-863-8898
NJ	Wayne, Breen Assocs.	201-696-8683
NY	Williamsville, CEF Tech. Sls.	716-633-7324
PA	Huntington Valley, C M C	215-938-7057
TX	Dallas, Allied Comps. Inc.	214-238-0408
TX	Houston, Allied Comps. Inc.	713-988-1600

SENSOR SYSTEMS, INC., 8929 Fullbright Ave., Chatsworth, CA 91311, Tel: 818-341-5366, TELEX: 69-1583; *Sls. Mgr.:* E. Schneider

SENSOTEC, INC., 1200 Chesapeake Ave., Columbus, OH 43212, Tel: 614-486-7723, TWX: 810-482-1188; FSC No.: 29927; *Sls. Mgr.:* Jack Feil

SENSYM, INC., 1255 Reamwood Ave., Sunnyvale, CA 94089, Tel: 408-744-1500, FAX: 408-734-0407; FSC No.: 5955; Empl.: 150; *Sls. Mgr.:* Fred Jones; *Dist. Mgr.:* Fred Jones

SENTRY MANUFACTURING, Crystal Park, Chickasha, OK 73018, Tel: 405-224-6780; FSC No.: 5955; Empl.: 30; *Sls. Mgr.:* Barbara Maberry

SERCO PRODUCTS DIVISION:SERCO MOLD, INC., 612 Commercial Ave., Covina, CA 91723, Tel: 818-331-0517, 800-843-8172(Calif.), FAX: 818-331-8584; Empl.: 45; *Sls. Mgr.:* Neil Reckon ..... **C•1092-1093**

Local Sales Offices & Reps

CA	Corte, Paul O'Neal & Assocs.	415-924-1691
CA	Covina, Serco Prods.	818-331-0517
CA	Valencia, Lessing & Assocs.	805-295-0225
CO	Northglenn, JBR Mktg. Svcs.	303-451-5338
GA	Norcross, Hollingsworth & Still, Inc.	404-447-1700
IL	Cary, Ellinger Sls. Corp.	312-639-1850
MA	Waltham, Gerber Sls. Corp.	617-890-3334
MO	Florissant, Delltron Co., Inc.	314-839-0033
NY	Pt. Washington, Ashtec, Inc.	516-767-0336
PA	Blue Bell, Techparts	215-628-3200
TX	Richardson, R. F. Kimball Co., Inc.	214-231-3447
Can	Ontario, Avotronics Ltd.	416-475-2024

Local Distributors

AL	Montgomery, Handey's Elctrn. Ctr. Inc.	205-262-4885
AZ	Phoenix, Capital Elctrns.	602-252-5897
AZ	Phoenix, Elctrn. Emporium Inc.	602-437-8633
AZ	Tucson, Electronic City	602-622-1173
CA	Canoga Park, Sandy's Elctrns.	818-346-0510
CA	Costa Mesa, Mar Vac Elctrns.	714-650-2001
CA	Fremont, Fry's Elctrns.	415-770-3700
CA	Fullerton, RF Elctrns.	714-447-1133
CA	Goleta, DOW Elctrns.	805-968-7272
CA	Hawiian Gardens, DOW Elctrns.	213-421-3786
CA	Hollywood, Pacific Radio Exchange	213-462-1393
CA	Inglewood, Inglewood Elctrns.	213-674-2366
CA	Oxnard, DOW Elctrns.	805-486-6353
CA	Pasadena, DOW Elctrns.	818-793-1195
CA	Pomona, DOW Elctrns.	818-966-8461
CA	Sacramento, Mar Vac California Radio	916-922-6531
CA	San Jose, Quement Elctrns.	408-998-5900
CA	Santa Maria, Elctrn. Parts Supermart	805-925-8604
CA	Sunnyvale, Fry's Elctrns.	408-733-1770
CT	Wallingford, Midstate Elctrns.	203-265-9900
FL	Delray Bch., Fastbolt FL Corp.	407-272-3100, 800-233-5036
FL	Largo, Applied Specialties of FL Inc.	800-722-4599
FL	Tampa, Sunnex Elctrn. Supp. Inc.	813-885-4074
FL	West Palm Beach, Dolphin Elctrn. Supp. Inc.	305-659-7166
IL	S. Holland, Union Elctrn. Distrs.	312-333-4100, 800-648-6657
MA	Lynn, Land Elctrns. Inc.	617-592-2220
MA	Waltham, Atlantic Comps.	617-890-3334
MI	Detroit, Elctrn. Parts Co.	313-891-7400
MN	S. Minneapolis, Tor Tec Corp.	612-866-3661
NJ	Lodi, Nidisco, Inc.	201-773-1771
NY	Hempstead, Davis Elctrns.	516-483-9200
NC	Durham, Southeastern Elctrns.	919-638-8204
NC	Greensboro, Guilford Elctrn. Supp. Inc.	919-275-1385
NC	Raleigh, Southeastern Elctrns.	919-828-2311
NC	Winston-Salem, Elctrn. Distrbg. Inc.	919-723-1097
TN	Clarksville, Randolph, Hale & Matthews Inc.	615-647-2325
TX	Austin, Electrotex, Inc.	512-454-0318
TX	Dallas, Electrotex, Inc.	214-234-0433
TX	Houston, Electrotex, Inc.	713-526-3456
WI	Fond du Lac, Fedco Elctrns. Inc.	414-922-6490
WI	Milwaukee, Marsh Elctrns. Inc.	414-475-6000
Can	Kingston, Ont., Electronic Packaging Sys. Ltd.	613-384-1142

SERIAL LAB PRODS., INC., 162 Cook Lane, P.O. Box 766, Marlboro, MA 01752, Tel: 617-481-1684, TELEX: 955318 Attn: SERIAL LAB; Empl.: 12; *Sls. Mgr.:* R. L. Wiedeman; *Dist. Mgr.:* D. Kreck

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SERVO-TEK PRODUCTS CO., 1086 Goffle Rd., Hawthorne, NJ 07506, Tel: 201-427-3100, TELEX: 130273; Empl.: 60; *Sls. Mgr.:* T. J. Daly ..... **B•1302**

SETRA SYSTEMS, INC., 45 Nagog Park, Acton, MA 01720, Tel: 508-263-1400, 1-800-25-SETRA, TELEX: 4430243, FAX: 508-264-0292; FSC No.: 53367; Empl.: 95; *Sls. Mgr.:* Ed Cope ..... **B•1990-1992**

Local Sales Offices & Reps

AL	Huntsville, Burnette Techno Metrics	205-830-2832
AK	Anchorage, Unit Process	907-522-1010
CA	Concord, QCon, Inc.	415-682-2020
CA	Downey, Dynasales Co.	213-806-1400
CA	Los Angeles, Dynasales Co.	213-268-1175
CO	Westminster, RMS Sls.	303-429-1111
FL	Tampa, Quantum Measurements Corp.	813-933-8078
GA	Atlanta, Craft Assocs.	404-256-0420
HI	Honolulu, Unit Process	808-834-7195
IL	Wheaton, Ray Knitter Assocs., Inc.	312-690-6363
IN	Ft. Wayne, Domino, Inc.	219-456-5512
IN	Indianapolis, Domino, Inc.	317-841-6159
KY	Louisville, Domino, Inc.	502-425-2848
LA	Metairie, Slaton & Assocs., Inc.	504-455-3855
MD	Columbia, Stein Instrs.	301-596-3748
MA	Ashland, J. M. Lancaster Co.	617-875-8893
MI	Hazel Park, Tiby Co.	313-547-3550
MN	Minneapolis, The Mark Co.	612-933-3026
OK	St. Louis, Adelphi, Inc.	314-821-2142
MT	Billings, Unit Process	406-252-0455

NJ Cedar Grove, KLS Assocs. 201-785-4450
NM Albuquerque, TMA, Inc. 505-345-8921
NY E. Rochester, A & D Dvcs. 716-385-2778
OH Cleveland, Tiby Co. 216-371-5335
OH Dayton, Tiby Co. 513-277-3822
OK Tulsa, Inotek Corp. 713-688-7000
OR Beaverton, Unit Process 406-252-0455
PA Cheltenham, Stein Instrm. 215-379-1990
TX Dallas, Inotek Corp. 214-243-7000
TX Houston, Inotek Corp. 918-627-1500
WA Kirkland, Unit Process 206-827-0433
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Can Ontario, Alpha Controls & Instr. 416-477-2133

SEVEN MOUNTAINS SCI. INC., P.O. Box 650, Boalsburg, PA 16827, Tel: 814-466-6559; Empl.: 4; *Sls. Mgr.:* Josephine Chesworth

SFERNICE, INC., 461 North 22nd Street, Grand Junction, CO 81502, Tel: 303-242-0810, FAX: 303-242-5917; FSC No.: 05347; *Sls. Mgr.:* G. W. (Jerry) Krebill; *Dist. Mgr.:* Danny Jagirdar

SFE TECHNOLOGIES, 1501 1st St, San Fernando, CA 91340, Tel: 818-365-9411, TWX: 910-496-1535, FAX: 818-365-5117; FSC No.: 96733; Empl.: 2000; *Sls. Mgr.:* Joe Lucia

S. F. PRODUCTS CORPORATION, P. O. Box 369, Southport, CT 06490, Tel: 203-929-6180; Empl.: 8; *Sls. Mgr.:* Norman W. Johanson; *Dist. Mgr.:* R. S. Johanson

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AZ Phoenix 602-867-6100
CA Irvine 714-250-0455
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CO Longmont 303-449-9000
IL Schaumburg 312-517-1890
MA Waltham 617-890-6688
NJ Voorhees 609-772-6222
TX Austin 512-339-4191
TX Carrollton 214-466-8844

Shallco

FAX: 919-934-3298

SHALLCO, INC., Box 1089, Smithfield, NC 27577, Tel: 919-934-3135; Empl.: 40; *Sls. Mgr.:* M. D. Sutton ..... **B•1836-1840; D•1053**

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AZ Fountain Hills, Westech Engrg. Sls. ... 602-837-3137
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FL Melbourne, Reynolds & Assocs., Inc. .. 305-259-7000
IN Fort Wayne, J & B Engrg. Sls. Co. 219-483-2813
IA Cedar Rapids, S & O Sls. 319-363-7323
MD Towson, Holden Engrg. Sls. 301-823-3763
MA Norwood, MPS Elctrn. 617-769-8700
MN Minneapolis, R-J Inc. 612-866-3661
NY E. Rockaway, HLJ 516-599-2999
NY Manhattan, Lothar Sanford Corp. 212-757-3881
NY Pittsford, D. Hurley Sls. 716-586-6159
OH Englewood, Allen Nace Co. 513-836-0931
OR Portland, Comp. Technlg., Inc. 503-292-1518
PA King of Prussia, Freedman-Malta Assocs. 215-337-9211
TX Dallas, Oeler & Menelaides, Inc. 214-361-8876

Local Distributors

FL Jacksonville, Southeast Elctrns. 904-356-3007
OH Cincinnati, United Radio 513-761-4030
TN Bristol, Broadcast Equip. & Supp. 615-878-2531
TX Dallas, Wholesale Elctrns. 214-824-3001

SHALLTRONIX

SHALLTRONIX CORP., Preston St., P.O. Box 235, Selma, NC 27576, Tel: 919-965-6346; FSC No.: 58258; *Sls. Mgr.:* Joe Deans ..... **D•1346**

Local Sales Offices & Reps

TX Arlington, Electronic Prod. Reps. 817-467-0377

SHAPE MAGNETRONICS, INC., 901 DuPage Ave., Lombard, IL 60148, Tel: 312-620-8394, 1-800-367-5811, TWX: 910-991-2352, FAX: 312-620-0784; Empl.: 110; *Sls. Mgr.:* Judy M. Madden; *Dist. Mgr.:* Judy M. Madden

SHAPIRO SCIENTIFIC INST., 3500 E. Coast Hwy., Corona del Mar, CA 92625, Tel: 714-675-1024; Empl.: 7

SHARP ELECTRONICS CORP., Microelectronics Div., Sharp Plaza, Mahwah, NJ 07430, Tel: 201-529-8757, TELEX: 71 134327, FAX: 201-529-8759; *Sls. Mgr.:* Terry Manton; *Dist. Mgr.:* Dave Matthews .. **A•1770-1773, 2200-2201; B•1110-1116, 1180-1183, 1218-1219, 1335-1346, 1623, 1995**

Local Sales Offices & Reps

AL Huntsville, Interep Assocs. 205-881-1096
AL Mobile, Interep Assocs. 205-478-1036
AZ Scottsdale, Thorson Desert State Inc. (TDSI) 602-998-2444
CA Newport Bch., Plustronics 714-476-8009
CA Ojai, Plustronics 805-646-1950
CA San Diego, Mesa Comps. 619-278-8021
CA Santa Clara, Quorum Tech. Sls. 408-980-0812
CA Sherman Oaks, Plustronics 818-995-8908
CO Denver, Seale & Assocs., Inc. 303-756-8855
CT Southington, Orion/DSA Grp. 203-621-8371
FL Boca Raton, Lawrence Assocs. 407-368-7373
FL Palm Bay, Lawrence Assocs. 407-951-0901
FL Winter Springs, Lawrence Assocs. 407-365-1945
GA Norcross, Interep Assocs. 404-449-8680
IL Des Plaines, Electron Mktg. 312-298-2330
KS Wichita, Baka Corp. 316-682-8411
MD Towson, Advanced Technlg. Sls., Inc. 301-296-9360
MA Marlborough, Orion/DSA Grp. 508-480-0516
MA Peabody, Orion/DSA Grp. 508-532-6266
MI Grand Rapids, DEM Sls., Inc. 616-364-4024
MI St. Clair Shores, DEM Sls., Inc. 313-777-1750
MN Minneapolis, Comstrand 612-788-9234
MO St. John, Baka Corp. 314-429-2252
NJ Allendale, Eastec Assocs. 201-934-7135
NY Pittsford, Noeth-Honsinger 716-586-9002
NC Raleigh, Zucker Assocs. 919-782-8433
OH Dayton, Five Star Elctrns., Inc. 513-299-1718
OH Solon, Five Star Elctrns., Inc. 216-349-1611
OR Beaverton, Blair Hirsh 503-641-1875
PA Erdenheim, Omni Sls. 215-233-4600
TN Greenville, Interep Assocs. 615-639-3491
TX Austin, Impaq Sls. Co. 512-474-1125
TX Carrollton, Impaq Sls. Co. 214-247-3300
TX Houston, Impaq Sls. Co. 713-820-0288
UT Salt Lake City, Seale & Assocs., Inc. .. 801-266-9056
VA Richmond, Advanced Technlgy. Sls. .. 804-320-8756
WA Lynwood, Blair Hirsh 206-774-8151
Can Mississauga, Ont., Hi-Tech Sls. Co., Ltd. 416-670-0284
Can Richmond, BC, Enerlec Sls. 604-273-0882

Local Distributors

CA El Monte, Marshall Inds. 818-459-5574
CA Saratoga, Western Micro Technlgy. 408-725-1660
CA Tustin, Added Value Elctrns. 714-259-8259
NY Farmingdale, Milgray 516-420-9800
Can Montreal, Que., Space Elctrns. 514-694-7710

SHELDAHL, INC., 1150 Sheldahl Rd., Northfield, MN 55057, Tel: 507-663-8000, TWX: 910-565-2180, FAX: 507-663-8545; Empl.: 1,257; *Sls. Mgr.:* Ed Lundstrom

SHELLY associates

FAX: 714-669-1081

SHELLY ASSOCIATES, INC., 14811 Myford Rd., Tustin, CA 92680, Tel: 714-669-9850, TELEX: 85-2263; FSC No.: 00303; Empl.: 30 ..... **B•1122**

Local Sales Offices & Reps

AZ Tempe, Spectrum Assocs., S.W. 602-966-1788
CA Mountain View, Leddy Assocs. 415-969-6313
CA San Diego, O'Donnell Assocs., Inc. 619-578-1645
CA Torrance, O'Donnell Assocs., Inc. 213-539-9664
CO Broomfield, Connors Co. 303-466-9628
FL Charlotte, Hollingsworth & Still, Inc. ... 800-241-5712
FL Plant City, Hollingsworth & Still, Inc. ... 800-241-5712
GA Norcross, Hollingsworth & Still, Inc. ... 404-447-1700
IL Skokie, Electro Tech Mktg. 312-676-3151
IN Ft. Wayne, Scott Elctrns. 219-484-7865
IN Indianapolis, Scott Elctrns. Inc. 317-841-0010
MA Sudbury, KSA of New England 508-443-5881
MI Ypsilanti, Techrep, Inc. 313-572-1950
MN Hopkins, Steve Forsythe & Assocs. ... 612-933-8267
MO Grandview, R. R. Burton & Assocs. 816-763-5385
MO Kirkwood, R. R. Burton & Assocs. 314-965-0451
NJ Boonton, TMA 201-263-2946
NY N. Syracuse, R. F. Roux Co. 315-458-9169
NY Port Washington, TMA 516-883-2432
NC Charlotte, Hollingsworth & Still, Inc. ... 800-241-5712
NC Kernersville, Hollingsworth & Still, Inc. 800-241-5712
OH Cincinnati, Scott Elctrns. 513-791-2513
OH Cleveland, Scott Elctrns. Inc. 216-473-5050
OH Kettering, Scott Elctrns., Inc. 513-294-0539
OH Reynoldsburg, Scott Elctrns. 614-863-1281
OR Beaverton, Luscombe Engrg. Co. 503-636-6664
PA Pittsburgh, Scott Elctrns. 412-963-6116
TX Dallas, de Forest Sls. Co. 214-349-3290
WA Bellevue, Luscombe Engrg. Co. 206-223-1541
WI Brookfield, Electro-Tech Mktg. Assocs. 414-785-9554
Can Scarborough, Ont., Banke Elctrns. 416-292-5152

Local Distributors

AR Ft. Smith, Radio, Inc. 501-646-5200
CA Anaheim, Bisco Inds. Inc. 714-635-0380
CA Fremont, VIC/TAL Sls. 415-651-6420
CA San Jose, Bisco Inds. Inc. 408-435-8980
CT Bridgeport, Park Distrs. Inc. 203-366-7200
CT Wallingford, Midstate Elctrns. Co. 203-265-9900
FL Bradenton, Specialty Distbg. 813-756-9571
FL Clearwater, Jenkins Supp. Co., Inc. 813-584-5252
GA Albany, Specialty Distrbg. Co., Inc. 912-435-1711
GA Athens, Specialty Distrbg. Co., Inc. 404-548-1334
GA Atlanta, A-C Equip. Co. 404-451-2747
GA Atlanta, Specialty Distrbg. Co., Inc. 404-458-6341
GA Augusta, Specialty Distrbg. Co., Inc. ... 404-772-1526
GA Brunswick, Specialty Distrbg. Co., Inc. 912-265-1927
GA College Park, Specialty Distrbg. Co., Inc. 404-763-3828
GA Columbus, Specialty Distrbg. Co., Inc. 404-327-7414
GA Macon, Specialty Distrbg. Co., Inc. 912-743-5421
GA Marietta, Specialty Distrbg. Co., Inc. ... 404-422-4333
GA Norcross, Specialty Distrbg. Co., Inc. .. 404-448-4004
GA Savannah, Specialty Distrbg. Co., Inc. 912-234-1684
IL Franklin Park, Bisco Inds. Inc. 312-451-1230

IN	Indianapolis, Mar Elctrns., Inc.	317-633-6699
IA	Cedar Rapids, Iowa Radio Supp. Co.	313-393-4510
IA	Cedar Rapids, Iowa Radio Supp. Co.	319-393-4510
MA	Woburn, Bisco Inds.	617-938-8590
MO	Kansas City, Elctrns. Supp. Co., Inc.	816-931-0250
NJ	Cranford, Garden State Indl. Elctrns.	201-272-6400
NJ	Fair Lawn, Relay Specialties	201-797-3313
NJ	Oakland, Relay Specialties	201-337-1000
NY	Elmsford, White Plains Elctrl.	914-592-9555
NY	Huntington, Energy Elctrl. Supp.	516-549-2722
NC	Raleigh, Svc. Plus Elctrns.	919-850-9550
OH	Strongsville, Roberts Elctrns. Co., Inc.	216-238-1711
OH	Twinsburg, Advacom, Inc.	216-425-8477
OK	Tulsa, Radio, Inc.	918-587-9123
PA	McKean, Advacom	814-476-7774
TN	Chattanooga, Specialty Distbg. Co.	615-267-9531
TX	Arlington, Bisco Inds.	817-640-7046
TX	Austin, Wofford Elctrns.	512-339-1131
TX	Houston, Wofford Elctrns.	713-847-3583
TX	Midland, ESI Supp.	915-694-9657
WI	Mequon, Lakeview Elctrns.	414-377-8250
Can	Calgary, Alberta, Memco	403-258-3399
Can	Surrey, B.C., Memco	604-590-1553

SKC

FAX: 818-764-6845

SHINANO KENSHI CORP. (SKC), 7525 Ethel Ave. Ste. I & K, N. Hollywood, CA 91605, Tel: 818-764-4266; Empl.: 6; *Sls. Mgr.:* Ken Shimizu ..... **B•1303**

Local Sales Offices & Reps

AL	Madison, Benchmark	205-464-0033
CA	North Hollywood, Shinano Kenshi Corp.	818-764-4266
CA	Santa Clara, Norcomp, Inc.	408-727-7707
CO	Denver, Tech Rep Sls. Co.	303-758-7031
CT	Bloomfield, SIR Assocs.	203-243-9343
FL	Melbourne, Phoenix Comps.	407-723-4414
GA	Norcross, Benchmark	404-446-1711
MA	Westford, SIR Assocs.	508-692-2500
MI	Brighton, A.P. Assoc.	313-229-6550
MN	Eagan, REL Comp.	612-688-8006
NY	Albertson, DOL Engrg.	516-747-3944
NY	Cazenovia, D & O Engrg.	315-655-8602
NY	Youngstown, D & O Engrg.	716-754-7650
NC	Charlotte, Benchmark	704-525-2131
NC	Raleigh, Benchmark	919-881-0077
OR	Portland, Intertech Sls.	503-775-7885
TX	Dallas, Theodore Borek Assoc.	214-985-7702
UT	Sandy, Intermountain Technlg.	801-566-5000

Local Distributors

CA	N. Hollywood, Digilog Dvcs., Inc.	818-764-9777

Shindengen America, Inc.

FAX: 805-373-3710

SHINDENGEN AMERICA INC., 2649 Townsgate Road, Ste. 200, Westlake Vl, CA 91361, Tel: 800-634-3654; Empl.: 10; *Sls. Mgr.:* Peter Gajewski; *Dist. Mgr.:* Peter Gajewski ..... **D•2046-2049**

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CA	Huntington Beach, Mil-Com Sls., Inc.	714-840-2424
CA	San Diego, Power Assocs.	619-275-0641
CA	Santa Clara, Quorum Tech. Sls.	408-980-0812
CO	Arvada, Arrowhead/CSI	303-423-5597
FL	Land O' Lakes, A.J.'s Power Source, Inc.	813-996-2583
GA	Norcross, 20th Century Mktg., Inc.	404-446-1999
IL	Rolling Meadows, Eagle Tech. Sls., Inc.	312-991-0700
IA	Cedar Rapids, C-Tron, Inc.	319-373-2029
KS	Olathe, C-Tron	319-373-2029
MD	Randallstown, Chesapeake Indl. Mktg.	301-922-5997
MI	Lathrup Vl, R. C. Nordstrom & Co.	313-559-7373
MO	St. Charles, C-Tron, Inc.	314-928-8078
NH	Nashua, Bell Controls, Inc.	603-882-6984
NJ	Parsippany, HLM Assocs.	201-263-1535
NY	Northport, HLM Assocs.	516-757-1606
NY	Pittsford, Franklin Sls. Corp.	716-248-8251
NC	Cary, 20th Century Mktg., Inc.	919-481-3370
OH	Cleveland, KT/Depco	216-777-7454
PA	Dresher, CMS Mktg.	215-885-4424
PA	Pittsburgh, KT/DEPCO	412-367-1011
TN	Knoxville, 20th Century Mktg., Inc.	615-966-2099
TX	Richardson, Jim Gray & Assocs.	214-699-9976
TX	Richmond, Jim Gray & Assocs.	713-342-1710
UT	Salt Lake City, Arrowhead/CSI	801-269-8614
Can	Concord, Ont., Votron Elctrns., Inc.	416-669-9870

Local Distributors

CO	Englewood, Displays Plus, Inc.	303-779-8053
CO	Wheat Ridge, A.V.E.D.-Rocky Mtn., Inc.	303-422-1701
IL	Schaumburg, QPS Elctrns.	312-884-6620
MD	Gaithersburg, Axis Elctrns.	301-840-9640
MI	St. Clair Shores, Spemco	313-771-2700
NJ	Pennsauken, Alta Elctrns.	609-488-1442
OH	Cleveland, Major Elctrns.	216-442-6200
UT	West Valley, A.V.E.D.-Salt Lake, Inc.	801-975-9500

SHIN-ETSU POLYMER AMERICA, INC., 34135 7th St, Union City, CA 94587, Tel: 415-475-9000, TWX: 910-338-2229, FAX: 415-475-0613; *Sls. Mgr.:* Doug Hall

SHOGYO INTERNATIONAL CORPORATION

FAX: 516-466-0922

SHOGYO INTERNATIONAL CORP., 287 Northern Blvd., Great Neck, NY 11021, Tel: 516-466-0911, TELEX: 4758024, TWX: 12218 ..... **A•2441; B•1186, 1841; C•1525-1527, 1920-1921; D•1054-1055, 1527, 2051**

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SHOKAI FAR EAST, LTD., 280 North Central Ave., Hartsdale, NY 10530, Tel: 914-681-0700; Empl.: 362; *Sls. Mgr.:* Shirlee Serber; *Dist. Mgr.:* Lee Goldberg, V.P. ..... **B•1187**

SHURE BROTHERS INC., 222 Hartrey Ave., Evanston, IL 60202-3696, Tel: 312-866-2200, TELEX: 4330191, FAX: 312-866-2279; *Sls. Mgr.:* L.Z. Morgan, VP Sls.

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Local Sales Offices & Reps

CA	Burbank, Modco Co.	818-848-2215
CA	Fremont, Abel & Assocs.	415-792-1686
CA	Fremont, Abel & Assocs.	415-794-4030
CA	San Diego, Qualtronics	619-695-0118
CO	Denver, Nelson Co. Inc.	303-295-1017
FL	Lakeland, Munday Sls. Co.	813-858-5606
IL	Cary, Bob Burns Assocs.	312-516-3322
IN	Indianapolis, John Sukup Inc.	317-253-5501
IA	Des Moines, The Beams Co.	515-255-1148
KS	Shawnee Mission, The Beams Co.	913-631-0300
MI	E. Detroit, Jack M. Thorpe Co.	313-779-6363
MO	St. Louis, The Beams Co.	314-434-8448
NJ	Belleville, D. F. Tobias & Co.	201-751-8680
NJ	Lawrenceville, DVS Co.	609-896-1112
NY	Fayetteville, H.C. Johnson Agencies	315-637-1143
NY	Rochester, H. C. Johnson Agys., Inc.	716-586-0777
NC	Raleigh, B.T. Funderburk Inc.	919-846-2373
OH	Cleveland, John Olsen Co.	216-662-3454
OH	Columbus, John Olsen Co.	614-478-9911
OH	Goshen, John Olsen Co.	513-722-3320
RI	Coventry, Adams McGregor Inc.	401-726-1300
TX	Dallas, The Crockett Sls. Co.	214-350-3377
WA	Seattle, Evergreen Mktg. Grp.	206-633-3160
Can	Thornhill, Ont., R. C. Kahnert Sls. Ltd.	416-731-9232
Can	Winnipeg, Manitoba, Smith-Patterson & Assocs.	204-885-1376

SIDEREAL CORP., TransTechnology Corporation, 9600 S.W. Barnes Rd., Portland, OR 97225, Tel: 503-297-5531, TELEX: 36-0640, TWX: 910-464-6139, FAX: 503-292-7730; Empl.: 250; *Sls. Mgr.:* Jeff Gretz

SIECOR ELECTRO-OPTIC PRODUCTS, Siecor Corporation, P.O. Box 13625, Research Triangle Park, NC 27709, Tel: 1-800-888-LAN1, 919-481-5100, TELEX: 821353, FAX: 919-481-0753; Empl.: 50; *Sls. Mgr.:* Glenn R. Constable

SIEMENS COMPONENTS, INC., Optoelectronics Division, 19000 Homestead Rd., Cupertino, CA 95014, Tel: 408-257-7910, TELEX: 352084, TWX: 910-338-0022; FSC No.: 50579; Empl.: 1100; *Sls. Mgr.:* Chuck Berghoff; *Dist. Mgr.:* Regina Walls

SIEMENS

FAX: 201-321-3961

SIEMENS COMPONENTS, INC., Special Products Div., 186 Wood Ave., South, Iselin, NJ 08830, Tel: 201-321-3400, TWX: 710-998-0588/0529; Empl.: 800; *Sls. Mgr.:* Curt Hozian; *Dist. Mgr.:* Dick Robert ..... **A•1171, 1331**

Local Sales Offices & Reps

AL	Huntsville, Interep assocs.	205-533-1730
AZ	Phoenix, Westrep	602-997-8899
CA	Anaheim, Westrep	714-527-2822
CA	Cupertino, Siemens Comps., Inc.	408-725-3566
CA	Cupertino, SC Sls. West	408-725-3531
CA	Orange, Siemens Comps., Inc.	714-385-1274
CA	San Diego, Varigon-San Diego, Inc.	619-576-0100
CO	Littleton, Lange Sls.	303-795-3600
FL	Apopka, G.F. Bohman Assocs.	305-886-1882
GA	Norcross, INTEREP	404-449-8680
GA	Norcross, Siemens Comps., Inc.	404-449-3981
IL	Park Ridge, Metcom Assocs.	312-696-1490
IL	Rosemont, Siemens Comps., Inc.	312-629-6000
IN	Indianapolis, Electro Reps., Inc.	317-842-7202
IA	Cedar Rapids, Cahill-Schmitz-Cahill	319-377-8219
MD	Lutherville, D.G. Reps.	301-583-1360
MA	Westborough, Anchor Engrg.	617-898-2724
MI	Troy, C. B. Jensen & Assocs.	313-643-0506
MN	St. Paul, Cahill-Schmitz-Cahill	612-646-7217
NJ	Special Prods. Div.	800-222-2203
NJ	Bellmawr, TAI Corp.	609-933-2600
NJ	Ft. Lee, Necco	201-461-2789
NJ	Princeton, Simens Comps., Inc.	609-987-0083
NM	Albuquerque, F-P Sls.	505-345-5553
NY	Liverpool, Gen- Tech	315-451-3480
NC	Smithfield, ADI, Inc.	919-934-8136
OH	Columbus, Siemens Comps., Inc.	614-433-7500
OH	Strongsville, Dolfuss-Root & Co., Inc.	216-238-0300
PA	Bridgeville, Dolfuss Root & Co.	412-221-4420
TN	Greenville, Interep	615-639-3491
TX	Arlington, CompTech Sls., Inc.	817-265-6007
TX	Austin, CompTech Sls., Inc.	512-331-8922
TX	Houston, CompTech Sls., Inc.	713-776-8330
UT	Salt Lake City, Lange Sls., Inc.	801-487-0843
WA	Bellevue, Micro Sls.	206-451-0568
PR	Rio Piedras, Klamco Elec.	809-752-6169

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AL	Huntsville, Hall-Mark	205-837-8700
AZ	Phoenix, Hall-Mark	602-437-1200

CA Canoga Park, Hall-Mark 818-716-7300
CA Irvine, Marshall 714-458-5394
CA Milpitas, Marshall Elec. 408-942-4700
CA San Jose, Hall-Mark 408-432-0900
CA Sunnyvale, Permag-Sierra Div. 408-738-1080
CO Thornton, Marshall Elec. 303-451-8444
FL Orlando, Hall-Mark 305-855-4020
GA Norcross, Marshall 404-923-5750
IL Elk Grove, Permag-Central Div. 312-956-1140
IL Rosemont, Advent 312-298-4210
IL Wooddale, Hall-Mark 312-860-3800
IN Indianapolis, Marshall 317-297-0483
MD Columbia, Hall-Mark 301-988-9800
MI Farmington Hills, Advent 313-477-1650
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NJ Fairfield, Hall-Mark 201-575-4415
NY Rochester, Marshall 716-235-7620
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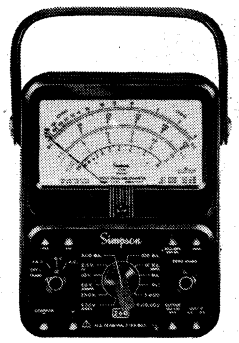

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SOLATRON ENTERPRISES, 421 E. Beach Ave., Inglewood, CA 90302, Tel: 213-678-4981; Empl.: 20

SOLDER ABSORBING TECHNOLOGY (SAT), A Spirig Co., 144 Oakland St., Springfield, MA 01108, Tel: 800-628-8862, FAX: 413-788-0490; Empl.: 8; *Sls. Mgr.:* Joyce White

SOLDER REMOVAL, P.O. Box 1678, Covina, CA 91722, Tel: 818-967-3681, TWX: 910-584-1820; FSC No.: 34605

SOLID STATE, INC., 46 Farrand St., Bloomfield, NJ 07003, Tel: 201-429-8700, TWX: 710-994-4780; Empl.: 110; *Sls. Mgr.:* T. King

SOLID STATE DEVICES, 14830 Valley View Ave., La Mirada, CA 90638, Tel: 213-921-9660, TWX: 910-583-4807, FAX: 213-921-2396; FSC No.: 30043; Empl.: 200

SOLID STATE ELECTRONICS CORP., 18646 Parthenia St., Northridge, CA 91324, Tel: 818-993-8257, FAX: 818-993-8259; FSC No.: 11911; Empl.: 15

SOLID STATE RELAYS, 71 Regent, Oak Brook, IL 60521, Tel: 312-932-1660, FAX: 312-887-9522; *Sls. Mgr.:* D. E. Wienke

SOLID STATE SYSTEMS, 1300 Shiloh Rd., N.W., Kennesaw, GA 30144, Tel: 404-423-2200, FAX: 404-423-2228; Empl.: 150; *Sls. Mgr.:* Max Biller; *Dist. Mgr.:* Max Biller

SOLID STATE TESTING, INC., 56 Middlesex Tpke., Burlington, MA 01803, Tel: 617-272-0972, TWX: 710-332-1620, FAX: 617-273-4896; Empl.: 150; *Sls. Mgr.:* James Roberts; *Dist. Mgr.:* James DiGiacomo

SOLITRON DEVICES, INC., Semiconductor Group, 1177 Blue Heron Blvd., Bldg. No.1, Riviera Beach, FL 33404-9978, Tel: 407-848-4311, TELEX: 51-3435, TWX: 510-952-7610, FAX: 305-863-5946; Empl.: 800; *Sls. Mgr.:* Margaret McNutt; *Dist. Mgr.:* Leah Rastrilli

SOLITRON/MICROWAVE, Solitron Devices, Inc., 1177 Blue Heron Blvd., Solitron Pk., Bldg. 2, Riviera Bch., FL 33404-9978, Tel: 407-848-4311, TELEX: 51-3435, FAX: 407-863-5946,Ext.116; FSC No.: 95077; Empl.: 200; *Sls. Mgr.:* Ray Sutzer; *Dist. Mgr.:* Deloris Martinez

SOLTEC CORP., Sol Vista Pk., San Fernando, CA 91340-1597, Tel: 818-365-0800, 800-423-2344, TELEX: 365-7089; Empl.: 80; *Sls. Mgr.:* Byron G. McIntire

SONICALL, INC., 35 Corporate Dr., Trumbull, CT 06611, Tel: 203-452-9555, FAX: 203-452-9555; *Sls. Mgr.:* Frank Handler ..... **D•1057**

SONICOR INSTRUMENT CORP., 100 Wartburg Ave., Copiague, NY 11726, Tel: 516-842-3344, TELEX: 649494, FAX: 516-842-3389; FSC No.: 31605; *Sls. Mgr.:* Arthur Liers; *Dist. Mgr.:* Arthur Liers

Sonnenschein

FAX: 203-271-2179

SONNENSCHEIN BATTERIES INC., 300 E. Johnson Ave., P.O. Box 339, Cheshire, CT 06410, Tel: 203-271-0091, 800-4-DRYFIT; Empl.: 21; *Sls. Mgr.:* C. T. Wright, V.P.; *Dist. Mgr.:* Lawrence (Skip) Moran ..... **D•1529**

Local Sales Offices & Reps

AZ Scottsdale, Electro Mktg. 602-991-0110
CA Cupertino, West-Comp, Inc. 408-245-3100
CA Norwalk, E.D. Rivers Assocs. 213-868-1471
CT Ansonia, Pace Assocs. 203-732-8756
IL Glendale Hgts., Beta Technlg. Sls. 312-790-9886
IN Greenfield, France Entprs. Inc. 317-462-6098
IL Cedar Rapids, Tech. Elctrns. Inc. 319-366-3443
MD Hunt Valley, Eagle Sls. Corp. 301-666-3930
MI Grand Rapids, R. P. Urban & Assocs. 616-245-0511
MN Minneapolis, International Elctrns. 612-571-0000
NY Victor, Net Sls. Co. 716-924-1844
NC Raleigh, L. G. White Southern 919-872-6049
NC Winston-Salem, L. G. White Southern 919-725-3612
PA Norris Town, Rivco January Inc. 215-631-1414
SC Greenville, L. G. White Southern, Inc. .. 803-271-0630
TX Austin, Delta Comps. 512-458-4288
TX Seagoville, Delta Comps. 214-287-6333
WI Milwaukee, Beta Technlg. Sls., Inc. 414-543-6609
Can Mississauga, Ont., Advanced Battery Sys. 416-670-7159

Local Distributors

AZ Scottsdale, Electro Mktg. 602-991-0110
CA Escondido, American Battery Supp. ... 619-746-8010
CA Garden Grove, MK Battery 714-554-9991
CA Mtn. View, Energy Sls. 415-969-0800
CA San Diego, Tauber Elctrns. 619-459-0216
CT Bloomfield, Midstate Battery 203-243-0646
CT Southbury, Justin Roberts Entprs. 203-746-6161
CT Wallingford, Greene-Shaw Co. 203-265-3333
FL Ft. Lauderdale, Marine & Gen. Battery 305-587-3523
GA Fayetteville, Frankland, Inc. 404-461-4026
GA Norcross, Applied Power Inc. 404-263-0421
HI Honolulu, Battery Factory 808-533-3312
IL Niles, Joseph Elctrns. 312-297-4200
IL Summit, Standard Battery 312-594-5401
IA Cedar Rapids, Dee Elctrns. 319-365-7551
MD Beltsville, Mark Elctrns. Supp. 301-792-0072
MD Glen Burnie, McClean Brothers 301-761-9200
MD Glen Burnie, Revacto Elctrns. 301-766-3400
MA Newton, Greene-Shaw Co. Inc. 617-969-8900
MI Grand Rapids, S F Elctrn. Supp. 616-459-0216
MI Lansing, Battery Exchange(Dynalite) .. 517-694-0411
MI Livonia, LWC Distrs. 313-464-7700
OH Columbus, Foster Battery (Dynalite) .. 614-444-1000
OH Millbury, Dynalite 419-837-6837
PA Phoenixville, OPS Prods. 215-933-9100
TX Dallas, M. Hutton & Co. 214-484-0580
TX Houston, Houston Whls. Elctrns. 713-644-8320
TX Kemah, Sail Tech 713-334-4690
VA Chesapeake, Battery Outlet 804-545-4442
VA Manassas, Battery House 703-631-2425
WA Redmond, Energy Sls., Inc. 206-883-2343
WA Redmond, GR Battery Sys. 206-885-4344

EXP Nasau, Bahamas, 21st Century Welding Co. 809-325-4624
EXP St. Thomas, V.I., Island Marine 809-776-0753
Can Mississauga, Ont., Advanced Battery Sys. 416-670-7159

SONOBOND ULTRASONICS INC., Inductotherm Industries, 200 E. Rosedale Ave., West Chester, PA 19380, Tel: 215-696-4710, 800-323-1269, TELEX: 902497, FAX: 215-692-0674; FSC No.: 15882; Empl.: 35; *Sls. Mgr.:* P. C. Krause

SORENSEN COMPANY, 5555 N. Elston Ave., Chicago, IL 60630, Tel: 312-775-0843, FAX: 312-775-7432; Empl.: 850; *Sls. Mgr.:* Ed Larrabee

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Local Sales Offices & Reps

AL	Huntsville, Advanced Comps. Mktg.	205-881-5493
AZ	Scottsdale, Advent Comp. Corp.	602-481-0044
CA	Mt. View, Del Bucchia & Assoc.	415-965-8045
CA	San Dimas, JPE Assoc.	818-359-4293
CO	Boulder, The Stratford Grp.	303-530-3194
FL	Tampa, Florida Comp. Sls.	813-960-7044
IL	Schiller Park, W.R.B. Inc.	312-678-7888
IN	Fort Wayne, Menze Sls.	219-747-5616
KS	Mission, The Mertens Co.	913-432-9323
MD	Glen Burnie, Macrotech Assocs.	301-766-1111
MA	Canton, Comtek Assoc.	617-828-2948
MI	Dearborn, Pitcher-Poulin, Inc.	313-582-5450
MN	Minneapolis, Tech. Comps. Grp.	612-536-9512
MO	Clayton, Mertens Co.	314-993-6600
NJ	Burlington, VDE Elctrns.	609-387-9331
NJ	Union, Pacent Engrg.	201-687-7197
NJ	Wayne, November Elctrn. Sls.	201-696-8683
NY	Great Neck, Pacent Eng. Co.	516-482-4678
NC	Siler City, Crossroads Elctrns.	919-742-2372
OR	Beaverton, Evergreen Mktg. Grp.	503-643-8020
TX	Irving, AID Elctrns.	214-790-4761
WA	Bothell, Evergreen Mktg. Grp.	206-485-8063
WI	Mequon, WM Bolles Assoc., Inc.	414-241-3320

Local Distributors

AZ	Phoenix, Minarik Elec. Co.	602-233-3000
CA	Covina, Selecta Switch	818-967-4123
CA	Gardena, California Switch & Signal	212-538-9830
CA	Glendale, Minarik Elec. Co.	818-507-6445
CA	Hayward, KEA Elctrns.	415-887-2900
CA	Irvin, J & J Elctrns.	714-455-0104
CA	Los Angeles, Electric Switches	213-660-1310
CA	San Diego, Minarik Elec. Co.	619-560-6632
CA	Santa Clara, Minarik Elec. Co.	408-727-0575
CA	Tustin, Western Switches	714-259-8144
CA	Van Nuys, Wes-Garde Comps. Grp.	213-873-4802
CO	Commerce City, Minarik Elec. Co.	303-289-5800
CT	Hartford, Wes-Garde Comp. Grp.	203-527-7705
FL	Lakeland, Wes-Garde Comp. Grp.	813-644-7564
GA	Tucker, CID, Inc.	404-491-3143
IL	Carol Spring, Wes-Garde Comp. Grp.	312-653-1460
IL	Crystal Lake, Sub-Sem	815-459-4139
IA	Atkins, The Carl Bergquist Co.	319-446-7456
MA	Canton, Comtek Assocs.	617-828-2948
MI	St. Clair Shores, Specialities Mfg.	313-771-2700
MN	Minneapolis, Carl Bergquist	612-835-2322
MO	St. Louis, Wes-Garde Comp. Grp.	314-567-7776
NH	Nashua, Wes-Garde Comp. Grp.	603-880-1971
NJ	Mt. Laurel, Wes-Garde Comp. Grp.	609-778-8190
NY	Woodside, Switches Unltd.	718-478-5000
OH	Westerville, Wes-Garde Comps. Grp.	614-885-0319
OR	Portland, Minarik Elec.	503-253-3402
SC	Columbia, Dixie Elctrns.	803-779-5332
TX	Dallas, Wes-Garde Comp. Grp.	214-357-1768
TX	San Antonio, Minarik Elec.	512-822-7097
WI	Mequon, Lake-View Elctrns.	414-377-8250
Can	Edmonton, Deskin Sls.	403-466-2106
Can	Montreal, Deskin Sls.	514-331-2860
Can	Ottawa, Deskin Sls.	613-729-1099
Can	Richmond, Vancouver, Deskin Sls.	604-324-8343
Can	Toronto, Deskin Sls.	416-475-1412
Can	Winnipeg, Deskin Sls.	403-466-2106

SOSHIN ELECTRIC CO., LTD., No. 18-18, 1-Chome Nakamagome, Ota-Ku, Tokyo, Japan, Tel: (03) 775-2111, TELEX: 246-6377, FAX: (03)775-2071; Empl.: 1,000; *Sls. Mgr.:* N. Hiraide, Foreign Trade Dept.

Local Sales Offices & Reps

CA	Chatsworth, Arco Elctrns.	818-882-8707

Local Distributors

CA	Chatsworth, Arco Elctrns.	818-882-8707
PA	Norristown, Capar Comps.	215-277-4188

SOUNDCOAT CO., INC., 1 Burt Dr., Deer Park, NY 11729-5701, Tel: 516-242-2200, TELEX: 12-5514, FAX: 516-242-2246; Empl.: 100; *Sls. Mgr.:* Mr. Carl Wolaver

SOURIAU, INC., 28309 N. Avenue Crocker, Valencia, CA 91355, Tel: 805-257-4830, TELEX: 4720328, TWX: 910-336-1553, FAX: 805-257-2383; Empl.: 79; *Sls. Mgr.:* Keith L. Olsen

SOUTH AMERICAN DEVELOPMENT CORP., Rte. 9G, R.D. 413, Hyde Park, NY 12538, Tel: 914-229-8866, FAX: 914-229-2634; Empl.: 80; *Sls. Mgr.:* C. Healy

SOUTHCO, INC., 210 N. Brinton Lake Rd., Concordville, PA 19331, Tel: 215-459-4000, TELEX: 83-1485, TWX: 710-760-1715, FAX: 215-459-4012; *Sls. Mgr.:* R. W. Dougherty

SOUTHERN COMPUTER CORP., 141 W. Wieuca Rd., Ste. 300-B, Atlanta, GA 30342, Tel: 404-252-3340, FAX: 404-252-8929; *Sls. Mgr.:* Ray Manley

SOUTHERN ELECTRONICS, F-Dyne, 726 So. Flower St., Burbank, CA 91502, Tel: 818-845-2458, FAX: 818-845-6348; Empl.: 100; *Sls. Mgr.:* Wayne Melvin

SOUTHTRONICS, INC., 1265 Kennestone Circle, Marietta, GA 30066-6029, Tel: 404-429-1000, FAX: 404-424-2000

SPACE ELECTRONICS, INC., 81 Fuller Way, Berlin, CT 06037, Tel: 203-829-0001, FAX: 203-829-0005; Empl.: 26; *Sls. Mgr.:* Richard Boynton

SPARKOMATIC, Rte. 6 & 209, Milford, PA 18337, Tel: 717-296-6444, TWX: 510-260-2682; Empl.: 400; *Sls. Mgr.:* Gary Pomes

SPECIALTY CABLE CORPORATION, P.O. Box 50, Wallingford, CT 06492, Tel: 800-456-SPEC, TWX: 510-100-4275, FAX: 203-269-5293; Empl.: 72

SPECIALTY CONNECTOR CO., 2100 Earlywood Dr., Franklin, IN 46131, Tel: 317-738-2800, TELEX: 217084

SPECIALITY ELECTRONICS, INC., 105 E. Rutherford St., Landrum, SC 29356, Tel: 803-457-3824; Empl.: 10; *Sls. Mgr.:* John Galli ..... **C•1529**

SPECO DIV., Components Specialties, Inc., P.O. Box 624, 1172 Rte. 109, Lindenhurst, NY 11757, Tel: 516-957-8700, 800-645-5516, TELEX: 96-7754, FAX: 516-957-9142; FSC No.: 516-957-9142; Empl.: 29; *Sls. Mgr.:* Eric Forman; *Dist. Mgr.:* Mel Hulkower

SPECTRACOM CORPORATION, 101 Despatch Drive, East Rochester, NY 14445-1484, Tel: 716-381-4827, TELEX: 9103509587, FAX: 716-381-4998

SPECTRAGRAPHICS CORP., 9125 Rehco Rd., San Diego, CA 92121, Tel: 619-450-0611, TELEX: 295439; Empl.: 250; *Sls. Mgr.:* Ray Barger, VP Sls.; *Dist. Mgr.:* Elliot Shev

SPECTRAL DYNAMICS DIVISION, Scientific-Atlanta, Inc., 4141 Ruffin Rd., San Diego, CA 92123-0575, Tel: 619-496-3400, TWX: 910-335-2022; Empl.: 250; *Sls. Mgr.:* John Anderson

SPECTRA LUX CORP., 11825 120th Ave. NE, Kirkland, WA 98034, Tel: 206-747-0560, FAX: 206-821-3193; FSC No.: 51896; Empl.: 85; *Sls. Mgr.:* Jon Dulude

SPECTRAN CORP., 50 Hall Road, Sturbridge, MA 01566, Tel: 508-347-2751, TELEX: 709816, FAX: 508-347-2747; FSC No.: 6V569; Empl.: 65

SPECTRASCAN, INC., 1110A Elkton Drive, Colorado Springs, CO 80907, Tel: 719-599-9254, TWX: 312194 SPECTRASCAN UD, FAX: 719-599-0815; Empl.: 15; *Sls. Mgr.:* Richard Schlueter

SPECTRA SONICS, 3750 Airport Rd., Ogden, UT 84405, Tel: 801-392-7531; Empl.: 35

SPECTRA-STRIP, See Amphenol Products

SPECTROL ELECTRONICS, 17070 East Gale Ave., City of Industry, CA 91745, Tel: 818-964-6565, TWX: 910-584-1314; Empl.: 600; *Sls. Mgr.:* S. Deiling

SPECTRON GLASS & ELECTRONICS, INC., 595 Old Willets Path, P.O. Box 13368, Hauppauge, NY 11788, Tel: 516-582-5600, TELEX: 968296; FSC No.: 57349; *Sls. Mgr.:* Bob Marshall

SPECTRONICS CORP., 956 Brush Hollow Rd., Westbury, NY 11590, Tel: 516-333-4840, TWX: 510-222-5877, FAX: 516-333-4859; Empl.: 125; *Sls. Mgr.:* Gary Naftaly

SPECTRUM CONTROL, INC., 2185 W. 8th St., Erie, PA 16505, Tel: 814-455-0966, FAX: 814-455-2550; FSC No.: 33095;5733; Empl.: 450; *Sls. Mgr.:* Herb Bostrom; *Dist. Mgr.:* H. Bostrom

Local Sales Offices & Reps

AL	Huntsville, Elctrn. Mktg., Inc.	205-536-3044
AZ	Phoenix, Westrep	602-997-8899
CA	Brea, Masco Elctrn., Inc.	714-529-0866
CA	Costa Mesa, Spectrum Control	714-432-8404
CA	Sunnyvale, Spectrum Control	408-735-9015
CO	Denver, Lindberg Co.	303-758-9033
FL	Altamonte Springs, Micro Elctrns.	305-332-7158
FL	Deerfield Bch., Micro-Elctrns. Comps.	305-426-8944
GA	Atlanta, Elctrn. Mktg. Assocs.	404-448-1215
IL	Crystal Lake, Spectrum Control	815-477-2600
KS	Overland Pk., Thomas L. Dowell & Assocs.	913-648-7373
MA	Chelmsford, Spectrum Control	617-458-9079
MN	Eagan, Spectrum Control, Inc.	612-452-9745
MO	St. Louis, Thomas L. Dowell & Assocs., Inc.	314-849-4234
NH	Nashua, Key Sls. of New England	603-888-8742
NJ	Brielle, EMC Technlgs., Inc.	201-223-6699
NJ	Clifton, Spectrum Control	201-779-7666
NY	E. Patchogue, EMC Technlgs.	516-286-5522
NC	Raleigh, Elctrn. Mktg. Assocs.	919-847-8800
PA	Erie, Spectrum Control, Inc.	814-455-0966
SC	Greenville, Elctrn. Mktg. Assocs.	803-223-4637
TX	Irving, Spectrum Control	214-929-0909
WA	Redmond, Elctrn. Mktg. Grp.	206-882-0962
EXP	PA, Erie, Spectrum Control	814-455-0966

Local Distributors

AZ	Scottsdale, Cypress Elctrns., Inc.	602-256-9642
CA	Buena Pk., Cypress Elctrns.	213-744-0355
CA	San Diego, Cypress Elctrns., Inc.	619-292-5611
CA	Santa Clara, Cypress Elctrns.	800-538-5112
CO	Englewood, Cypress Elctrns.	303-792-5829
FL	Melbourne, Aschbacher Elctrns.	305-729-0628
IL	Chicago, Newark Elctrns.	312-784-5100
MN	Eden Prairie, Cypress Elctrns., Inc.	612-934-2104
MO	St. Charles, Finnigan Elctrns., Inc.	314-946-6201
NJ	Old Bridge, Metuchen Capacitors	201-679-3366
NY	Buffalo, Summit Distrs.	716-887-2800
NY	Rochester, Summit Distrs.	716-334-8110
OH	Dayton, Aschbacher	513-252-7785
OR	Beaverton, Cypress Elctrns., Inc.	503-641-2233
TX	Dallas, Cypress Elctrns.	214-869-1435
WA	Bothell, Cypress Elctrns. Inc.	206-483-1144
Can	Buffalo, Summit Distrs.	800-245-0152

SPECTRUM SIGNAL PROCESSING INC., 264 H Street, P.O. Box 8110-25, Blaine, WA 98230, Tel: 1-800-663-8986 (US), 604-438-7266 (Can.), FAX: 604-430-3046; Empl.: 14; *Sls. Mgr.:* Judy A. Bishop

Local Sales Offices & Reps

CA	Manhattan Bch., Forth, Inc.	213-372-8493
MA	Waltham, Spectrum Signal Processing	800-323-1842,617-890-3400
TX	Dallas, Hyperception	214-343-8525
Can	Vancouver, B.C., Spectrum Signal Processing	800-663-8986,604-438-7266

Spectrum Technology Inc.

FAX: 805-683-3481

SPECTRUM TECHNOLOGY, INC., DATUM, Incorporated, 300 Lopez Rd., Goleta, CA 93436, Tel: 805-964-7791, TWX: 910-334-1163; FSC No.: 32464; Empl.: 80; *Sls. Mgr.:* Bill Beck ..... **A•1484-1487**

Local Sales Offices & Reps

AZ	Phoenix, Sedco Sls.	602-461-9069
CA	Los Angeles, The Thorson Co.	213-595-0361
FL	Ocala, Felcomp	904-288-2365
IL	Elgin, R.K. Elctrns.	312-695-8552
MA	Needham Hgts., Todino Engrg. Sls.	617-444-7925
TX	Dallas, Caton Sls.	214-243-4716
VA	Fairfax, Schibley Assocs.	703-591-3008

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High Voltage Electronics Corporation

FAX: 516-349-8699

SPELLMAN HIGH VOLTAGE ELCTRNS. CORP., 7 Fairchild Ave., Plainview, NY 11803, Tel: 516-349-8686, TWX: 510-221-2155; Empl.: 150; *Sls. Mgr.:* Tom Stutzbach; *Dist. Mgr.:* Eric Marko ..... **D•2057-2061**

Local Sales Offices & Reps

WA	Kirkland, Syntek	206-488-0394
Can	British Columbia, Broman Engrg.	604-254-6311

SPEMCO SWITCHES, 23425 Harper, Box 386, St. Clair Shores, MI 48080, Tel: 800-482-2828, FAX: 313-771-3491; Empl.: 12

SPERRY, A. W. INSTRUMENTS, P.O. Box 9300, Smithtown, NY 11787, Tel: 516-231-7050, 800-645-5398, TELEX: 645104, FAX: 516-434-3128; Empl.: 50; *Sls. Mgr.:* Dennis W. Carroll

SPIRA MANUFACTURING CORP., 12721 Saticoy Street South, North Hollywood, CA 91605, Tel: 818-764-8222, FAX: 818-764-9880; FSC No.: 60050; Empl.: 18; *Sls. Mgr.:* Lisa A Panzich

SPIRICON, INC., 2600 North Main, Logan, UT 84321, Tel: 801-753-3729, TELEX: 296-465 SPIR UR, FAX: 801-735-5231; Empl.: 15; *Sls. Mgr.:* Chuck Farnworth

SPRAGUE ELECTRIC COMPANY, Distbn.Div., 41 Hampden Rd., P.O. Box 9102, Mansfield, MA 02048-9102, Tel: 617-339-8900, TELEX: 928071, TWX: 7103210021; FSC No.: 56289; Empl.: 10,500; *Sls. Mgr.:* Lyle Pirnie, GM; *Dist. Mgr.:* James O'Sullivan, Sls. Mgr. ..... A•1173

Local Sales Offices & Reps

AL	Huntsville, Montgomery Mktg., Inc.	205-830-0498
AZ	Tempe, Techni-Source, Inc.	602-730-8093
CA	Cupertino, Sprague Elec. Co.	408-973-7878
CA	Santa Ana, Jones & McGeoy Sls., Inc.	714-547-6466,818-244-9884
CA	Santa Clara, Criterion Sls.	408-988-6300
CA	Torrance, Sprague Elec. Co.	213-534-1165
CA	Van Nuys, Jones & McGeoy Sls., Inc.	818-994-6500
CO	Englewood, William J. Purdy Assocs.	303-790-2211
CT	North Haven, Kitchen & Kutchin, Inc.	203-239-0212
CT	Southbury, Sprague Elec. Co.	203-264-9595
FL	Altamonte Springs, Sprague Elec. Co.	407-831-3636
FL	St. Petersburg, Electramark Florida, Inc.	813-894-2299
FL	Tampa, Sprague Elec. Co.	813-962-1882
GA	Norcross, Montgomery Mktg., Inc.	404-447-6124
GA	Norcross, Sprague Elec. Co.	404-263-3715
ID	Boise, Bob Sickler Sls.	208-344-9588
IL	Rolling Meadows, Sumer, Inc.	312-991-8500
IN	Indianapolis, Sprague Elec. Co.	317-253-4247
IN	Indianapolis, SAI Mktg. Corp.	317-545-1010
IA	Cedar Rapids, J.R. Sls. Engrg., Inc.	319-393-2232
KS	Overland Park, EPI Inc.	913-642-9118
MD	Owings Mills, Sprague Elec. Co.	301-363-7600
MA	Burlington, Kitchen & Kutchin, Inc.	617-229-2660
MI	Ann Arbor, Sprague Elec. Co.	313-665-8900
MI	Fenton, SAI Mktg. Corp.	313-750-1922
MN	Minneapolis, HMR, Inc.	612-888-2122
MS	Jackson, EPI Southwest	601-856-6251
MO	St. Louis, EPI Inc.	314-962-1411
NH	Salem, Sprague Elec. Co.	603-893-0016
NJ	Cherry Hill, Trinkle Sls., Inc.	609-795-4200
NJ	Fairfield, Astrorep, Inc.	201-808-0025
NY	Babylon, Astrorep, Inc.	516-422-2500
NY	East Syracuse, Ossmann Assocs., Inc.	315-437-7052
NY	Hauppauge, Sprague Elec. Co.	516-231-8090
NY	Henrietta, Ossmann Assocs., Inc.	716-359-1200
NC	Charlotte, Sprague Elec. Co.	704-527-1306
NC	Raleigh, Montgomery Mktg., Inc.	919-851-0010
OH	Columbus, SAI Mktg. Corp.	614-451-0778
OH	Dayton, SAI Mktg. Corp.	513-435-3181
OH	Warrensville Heights, SAI Mktg. Corp.	216-591-0530
TX	Austin, Sprague Elec. Co.	512-458-2514
TX	Dallas, Sprague Elec. Co.	214-235-1256
TX	Richardson, Bonser-Philhower Sls.	214-234-8438
WA	Vancouver, Sprague Elec. Co.	206-892-0361
WI	Brookfield, Sumer, Inc.	414-784-6641
PR	Rio Piedras, Elctrn. Sls. Assocs.	809-762-6707
Can	Burnaby, B.C., Vitel Elctrns.	604-439-1136
Can	Kanata, Ont., Vitel Elctrns.	613-592-0090
Can	La Chine, Que., Vitel Elctrns.	514-636-5951
Can	Mississauga, Ont., Vitel Elctrns.	416-676-9720
Can	Toronto, Ont., Sprague Elec. of CAN, Ltd	416-766-6123

Local Distributors

CA	Culver City, Hamilton/Avnet Elctrns.	213-558-2000
CA	El Monte, Marshall Inds., Inc.	818-459-5500
CA	Santa Clara, Wyle Labs/EMG	408-727-2500
CA	Sunnyvale, Acacia/VWR Elctrns.	408-745-7200
CA	Tustin, Projections Unltd., Inc.	714-544-2700
CT	Milford, Falcon Elctrns., Inc.	203-878-5272
FL	Tampa, Reptron Elctrns., Inc.	813-855-4656
IL	Chicago, Newark Elctrns. Corp.	312-784-5100
IN	Indianapolis, Graham Elctrn. Supp., Inc.	317-634-8202
MD	Timonium, Zebra Elctrns.	301-252-6576
MA	No. Adams, Elctrn. Supp. Ctr.	413-664-1086
NY	Buffalo, Summit Distrs.	716-887-2800
NY	Mamaroneck, New Yorker Elctrns., Inc.	914-698-7600
NY	Melville, Arrow Elctrns. Distbn. Div.	516-391-1300
NY	Port Chester, Zeus Comps., Inc.	914-937-7400
NY	Ronkonkoma, Tri-Start Elctrns.	516-737-2200
NY	Westbury, Schweber Elctrns. Corp.	516-334-7555
OK	Tulsa, Radio, Inc.	918-587-9123
PA	Montgomeryville, Pyttronic Inds., Inc.	215-643-2850
PA	Philadelphia, Almo Elctrns., Inc.	215-698-4003
TX	Ft. Worth, TTI, Inc.	817-831-8300
TX	Houston, Kent Elctrns.	713-780-7770
TX	Houston, Sterling Elctrns.	713-623-6600
WI	Milwaukee, Marsh Elctrns., Inc.	414-475-6000
Can	Pointe Claire, Montreal, Future Elctrns., Inc.	514-694-7710

SPRAGUE ELECTRIC COMPANY:THICK FILM PRODUCTS, 267 Lowell Road, Hudson, NH 03051, Tel: 603-881-7200, FAX: 603-881-3168

See Sprague Electric World Headquarters listing for list of sales offices and reps.

SPRAGUE ELECTRIC COMPANY:THE COMPONENTS GROUP, 267 Lowell Rd., Hudson, NH 03051, Tel: 603-881-7200

See Sprague Electric World Headquarters listing for list of sales offices and reps.

SPRAGUE ELECTRIC COMPANY, FIL-MAG Business Unit, 3010 Del Sol Blvd., San Diego, CA 92154-3483, Tel: 619-575-9353, TWX: 619-575-9425, FAX: 619-575-4081; FSC No.: 56289; *Sls. Mgr.:* Lindo Sorrentino

See Sprague Electric World Headquarters listing for list of sales offices and reps.

SPRAGUE ELECTRIC COMPANY, The Semiconductor Group, 115 Northeast Cutoff, Box 2036, Worcester, MA 01613-2036, Tel: 617-853-5000, TWX: 710-340-6304, FAX: 617-853-5049; *Sls. Mgr.:* Brad Marshall, VP Sls. & Mktg., Semiconductor Grp.

See Sprague Electric World Headquarters listing for list of sales offices and reps.

SPRAGUE GOODMAN

FAX: 516-746-1396

SPRAGUE-GOODMAN ELCTRNS., INC., 134 Fulton Ave., Garden City Pk., NY 11040, Tel: 516-746-1385, TELEX: 14-4533; FSC No.: 52769; Empl.: 80; *Sls. Mgr.:* Michael Trubowitsch ..... A•1174-1175

Local Sales Offices & Reps

AL	Huntsville, Interep Assocs.	205-533-1730
AZ	Mesa, System Sls. of Arizona	602-464-9989
CA	Cupertino, Dura Elctrn. Sls.	408-255-2084
CA	Garden Grove, ELSCO Elctrns.	714-891-4621
CO	Denver, West Inc.	303-477-8180
CT	Beacon Falls, KSA Connecticut	617-443-5881
FL	Clearwater, Beacon Elctrn. Assocs.	813-796-2378
GA	Norcross, Interep Assocs., Inc.	404-449-8680
IL	Chicago, B.N.I. Elctrns.	312-775-1717
IN	Ft. Wayne, Denton Mktg., Inc.	219-486-0665
IA	Marion, M.S.B. Assocs.	319-377-6261
KS	Shawnee Mission, M.S.B. Assocs.	913-432-2131
MD	Monkton, Imagitron Sls.	301-374-5600
MA	Sudbury, KSA of New England	617-443-5881
MI	Brighton, A.P. Assocs.	313-229-6550
MO	St. Charles, M.S.B. Assocs.	314-946-5577
NJ	Chatham Township, Richman/Waterview Tech. Sls.	201-635-1839
NM	Albuquerque, SSA of New Mexico	505-889-2901
NY	Commack, Richman Sls. Co.	516-543-5532
NY	Utica, Upstate Engrg. Sls.	315-797-6721
NC	Raleigh, Micro Sls. Inc.	919-881-0007
OH	Cincinnati, Stegman Blaine Mktg.	513-729-1969
OR	Portland, Harry Levinson	503-245-1902
PA	Maple Glen, Imagitron/Pennsylvania	800-638-3592
TN	Greenville, Interep Tennessee	615-639-3491
TX	Seagoville, Delta Comps.	214-287-6333
WA	Seattle, Harry Levinson Co.	206-382-1300
PR	Rio Piedras, Elctrn. Sls. Assocs.	809-762-6459
Can	Toronto, Ont., Norgay Entprs.	416-259-9663

Local Distributors

CA	Chatsworth, TTI, Inc.	818-709-1010
CA	Garden Grove, Natl. Elctrns.	714-892-7749
AL	Huntsville, Comp. Dists.	205-883-7501
CA	Irvine, Kelex Elctrns.	714-863-1230
CA	Milpitas, Projections Unltd.	408-942-1717
CA	Milpitas, TTI, Inc.	408-943-9155
AZ	Phoenix, Arizona Comps.	602-269-5655
CA	San Diego, Neumann Elctrns.	619-695-3005
CA	San Diego, Projections Unltd.	619-453-7900
CA	Tustin, Projections Unltd.	714-544-2700
CO	Westminster, TTI, Inc.	303-429-6806
FL	Ft. Lauderdale, Bros. Elctrns. of FL	305-561-6700
FL	Ft. Lauderdale, Hammond Elctrns.	305-973-7103
FL	Melbourne, Comp. Dists.	305-724-9910
FL	Orlando, Hammond Elctrns.	305-849-6060
FL	Orlando, TTI, Inc.	305-859-1000
IL	Skokie, Kellner Elctrns., Inc.	800-323-0460
IN	Indianapolis, Pioneer/Indiana	317-849-7300 (x 350)
KS	Overland Pk., Schweber Elctrns.	913-492-2922
MD	Columbia, TTI, Inc.	301-995-1331
MA	Woburn, Sterling Elctrns.	617-938-6200
MA	Woburn, TTI, Inc.	617-938-8800
MN	Eden Prairie, TTI, Inc.	612-944-5080
MO	Earth City, Schweber Elctrns.	314-739-0526
NJ	Morganville, Varitech Elctrns., Inc.	201-591-8801
NY	Buffalo, Summit Dists., Inc.	716-887-2835/2836
NY	Mamoroneck, New Yorker Elctrns.	914-698-7600
AZ	Phoenix, TTI, Inc.	602-966-1616
NY	Ronkonkoma, Tri-Start Elctrns.	516-737-2200
NY	Ronkonkoma, TTI, Inc.	516-737-2000
OH	Columbus, TTI, Inc.	614-848-5770
OH	Dayton, Pioneer/Dayton	513-236-9900
PA	Harrisburg, Adtech	717-939-8337
PA	Pittsburgh, Schweber Elctrns.	412-782-1600
TX	Dallas, Comp. Dists.	214-644-0373
TX	Ft. Worth, TTI, Inc.	800-433-7637
TX	Garland, J & S	214-487-8808
VT	Charlotte, Kellner Elctrns., Inc.	800-323-0460
WA	Redmond, TTI, Inc.	206-882-0291
WA	Seattle, Kam Elctrns.	206-382-1300
WI	Milwaukee, Marsh Elctrns., Inc.	414-475-6000

SPRAGUE SEMICONDUCTOR GROUP:SPRAGUE ELECTRIC CO., 363 Plantation St., Worcester, MA 01605, Tel: 508-795-1300, TELEX: 476-1101, TWX: 510-661-7267, FAX: 508-792-9024; FSC No.: 31019,0CVK3,2D532; Empl.: 2000; *Sls. Mgr.:* B. Marshall

SPRUCE PINE MICA CO., Mtn. Laurel Dr., Spruce Pine, NC 28777, Tel: 704-765-4241, FAX: 704-765-7192; Empl.: 45; *Sls. Mgr.:* Bill Pittman

SPS INC. (MUIRHEAD VACTRIC), 51 Commerce St., Springfield, NJ 07081, Tel: 201-376-1222, TELEX: 13-8275; FSC No.: 0BKV4; Empl.: 60; *Sls. Mgr.:* Bob Conroy

SPS SOFTWARE PRODUCTS & SERVICES, INC., 14 E. 38th Street, 14th Fl, New York, NY 10016, Tel: 212-686-3790, TELEX: 852616, FAX: 212-481-7464; *Sls. Mgr.:* Peter Voletsky

SPUR PRODUCTS CORP., 13649 Beach Ave., Marina Del Rey, CA 90292, Tel: 213-822-7100, FAX: 213-578-0370; Empl.: 19; *Sls. Mgr.:* Ray Lorenz

SQUARE D CO., Executive Plaza, Palatine, IL 60067, Tel: 312-397-2600, TELEX: 247-119, FAX: 312-397-8814; Empl.: 20,500; *Sls. Mgr.:* C. N. Thompson, VP; *Dist. Mgr.:* E.P. Mazzetta

SR ENGINEERING, BW/IP International, Inc., 13961 Nautilus Dr., Dept. E, Garden Grove, CA 92643, Tel: 714-554-4200, TELEX: 364412INTR-871, FAX: 714-554-1069; FSC No.: 21441; *Sls. Mgr.:* Coleman W. Conrad

Local Sales Offices & Reps

AL	Huntsville, Hughes Assocs., Inc.	205-533-9108
AZ	Phoenix, The Knight Co.	602-994-1311
CA	Hayward, Liaison, Inc.	415-783-1131
CA	Los Angeles, The Knight Co.	714-833-8250
CA	Mesa, Protech-Mktg.	602-832-7113
MA	Hingham, Shain Assocs., Inc.	617-740-2334
FL	Orlando, Hughes Assocs., Inc.	305-774-7117
IL	La Grange Pk., Bierhaus Sls. Inc.	312-354-5100
IA	Cedar Rapids, Howard R. Brown Sls. Co.	319-366-6635
NH	Nashua, Shain Assocs., Inc.	603-881-4881
NY	Roslyn Hgts., Travco Assocs.	516-621-3223
OH	Dayton, Frederic L. Ohmer & Assoc.	513-434-1454
PA	Glenside, Koebert Assoc., Inc.	215-887-2310
WA	Seattle, Liaison, Inc.	206-767-3870

SRITEK, INC., 8705 Freeway Dr., Macedonia, OH 44056, Tel: 216-468-3380; Empl.: 40; *Sls. Mgr.:* Dennis Vinci

SSAC INCORPORATED, P.O. Box 1000, Baldwinsville, NY 13027, Tel: 315-638-1300, TELEX: 64-6221, FAX: 315-638-0333; FSC No.: 16-0985719; Empl.: 250; *Sls. Mgr.:* G. Weeks

STACKBIN CORP., Albion Road, P.O. Box 397, Lincoln, RI 02865, Tel: 401-333-1600, 800-333-1603, FAX: 401-333-1952; Empl.: 75; *Sls. Mgr.:* Valerie Baxter; *Dist. Mgr.:* Timothy J. O'Leary

STACKPOLE, CARBON DIV., 201 Stackpole St., St. Marys, PA 15857, Tel: 814-781-1234, TELEX: 914-514, TWX: 510-693-4511; *Sls. Mgr.:* R.E. Braund

STACKPOLE COMPONENTS CO., See Ark-les Special Products Grp., Div. of Stackpole Switches

STACKPOLE, MAGNET DIV., 201 Stackpole St., St. Marys, PA 15857, Tel: 814-781-1234, FAX: 814-781-8560; *Sls. Mgr.:* G.A. Olson Sr., Mktg. Mgr.

STACO, INC., See Staco Transpower

STACO ENERGY PRODUCTS CO.

FAX: 513-253-1723

STACO ENERGY PRODUCTS CO., 301 Gaddis Blvd., Dayton, OH 45403, Tel: 513-253-1191, TELEX: 288-032; FSC No.: 83008; Empl.: 146; *Sls. Mgr.:* Robert Simpson ..... **A•2460-2461; D•2234**

Local Sales Offices & Reps

CA	Costa Mesa, Stacoswitch	714-549-3041
CO	Wheat Ridge, Cluff	303-425-6604
FL	Maitland, H & H	305-831-2474
GA	Atlanta, Millar	404-634-3350
IL	Chicago, Saffro	312-677-9720
IN	Indianapolis, EMCI	317-921-3452
KS	Shawnee Mission, MSB	913-432-2131
MA	Lexington, Hathaway	617-861-1010
MI	Detroit, Shalco	313-547-4771
MN	St. Paul, Kencotronics	612-645-7717
NM	Albuquerque, Carlberg	505-836-1448
NY	Northport, LSC	516-266-5020
NC	Raleigh, Millar	919-828-8840
OH	Cleveland, Rockford	216-725-3705
PA	Philadelphia, ECSC	215-825-8610

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TX	Dallas, B E R	214-985-0028
WA	Seattle, Backer	206-285-1300
Can	Scarborough, Decade	416-439-9921

Local Distributors

AL	Birmingham, JLS	205-322-2486
CO	Arvada, Denver Beta Wintronics	303-431-7161
CO	San Francisco, Stevens Engrg.	415-588-9200
CT	Wallingford, Sager Elctrns.	203-265-4600
FL	Miami, Elctrn. Equip.	305-871-3500
GA	Atlanta, Cleveland Elec.	404-696-4550
HI	Honolulu, Victor Kim	808-841-6266
IL	Chicago, Newark Elctrns.	312-784-5100
IN	Indianapolis, Bell Elctrns.	317-875-8200
KY	Louisville, Peerless	502-637-7674
LA	Lafayette, Ralph's	318-234-4507
MA	Somerville, Electro Sls.	617-666-0500
MI	Madison Hgts., Galco	313-542-9090
MN	Minneapolis, Elctrn. Center	612-378-2442
MS	Jackson, Ellington Elctrns.	601-355-0561
MO	St. Louis, Chelsea Elctrns.	314-997-7709
NJ	Kenilworth, Federated Purchaser	201-272-0505
NY	Hauppauge, Broadline Elctrns.	516-231-4100
NC	Winston-Salem, Kirkman Elctrns.	919-722-9131
OH	Dayton, Stotts Friedman Elctrns.	513-298-5555
PA	Drexel Hill, Kass Elctrns.	215-449-2300
SC	Charleston, Wholesale Elctrns.	803-722-2634
TN	Knoxville, Indl. Elctrns.	615-573-7135
TX	Ft. Worth, Allied Elctrns.	817-336-5401
VA	Charlottesville, VA Elctrns.	804-296-4184
WA	Seattle, Radar Elec.	206-282-2511
WI	Milwaukee, Marsh Elctrns.	414-475-6000
Can	Scarborough, Decade Elctrns.	416-439-9921

STACOSWITCH, 1139 Baker St., Costa Mesa, CA 92626, Tel: 714-549-3041, TWX: 910-595-1507, FAX: 714-549-0930; FSC No.: 12522;Multiple; Empl.: 115; *Sls. Mgr.:* D. Sugg

STACO TRANSPOWER, 610 W. 6th St., Mt. Carmel, IL 62863, Tel: 618-262-5555, TELEX: 510-525-2254, FAX: 618-263-3150; FSC No.: 83008; Empl.: 100; *Sls. Mgr.:* Jim Anderson

STAFFALL INC., 1468 Elmwood Ave., Cranston, RI 02910, Tel: 401-461-5554, TWX: 710-381-6964; Empl.: 25

STAINLESS, INC., 3rd St., N. Wales, PA 19454, Tel: 215-699-4871, TWX: 510-661-8097, FAX: 215-699-9597; Empl.: 80; *Sls. Mgr.:* Jess C. Rodriguez

STANCOR PRODUCTS, Hamilton Standard Controls, 131 Godfrey St., Logansport, IN 46947, Tel: 219-722-2244, TWX: 810-295-0699, FAX: 219-722-5189; FSC No.: 80089; Empl.: 400; *Sls. Mgr.:* Terry D. Smith; *Dist. Mgr.:* Terry D. Smith

STANDARD CONDENSER CORP., 8151 N. Ridgeway, Skokie, IL 60076, Tel: 312-675-3133; FSC No.: 97419; *Sls. Mgr.:* B. P. McLean

STANDARD CRYSTAL CORPORATION, 9940 E. Baldwin Pl., El Monte, CA 91731, Tel: 818-443-2121, TELEX: 4998755, FAX: 818-443-9049; FSC No.: 30149; *Sls. Mgr.:* Tom Valasek; *Dist. Mgr.:* Betty Longwell ..... **A•1488**

Local Sales Offices & Reps

AZ	Phoenix, CPS Assocs., Inc.	602-246-1097
CA	San Jose, Ruppert Sls. & Engrg.	408-998-8717
IL	Berkeley, ESA Tech. Mktg.	312-544-0120
IL	Northbrook, Allied Comp. Reps., Inc.	312-498-6658
MI	Grand Rapids, R.P. Urban & Assocs.	616-245-0511
OR	Togard, LD Elctrns.	503-684-8221
TX	Dallas, Allied Comps., Inc.	214-238-0408
UT	Salt Lake City, Sage Sls.	801-467-5451

STANDARD ENVIRONMENTAL SYSTEMS, INC., 383 Minnisink Rd., Totowa, NJ 07512, Tel: 201-256-2200, TWX: 710-988-5722, FAX: 201-256-2820; Empl.: 50

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STANDARD GRIGSBY, INC., Flint Industries, 920 Rathbone Ave., Aurora, IL 60507, Tel: 312-844-4300, TWX: 910-232-3138; Empl.: 350; *Sls. Mgr.:* Jeff Shaw; *Dist. Mgr.:* Jeff Shaw ..... **B•1842-1843**

Local Sales Offices & Reps

AZ	Scottsdale, Heath & Assocs.	602-945-9546
CA	Laguna Hills, Jack Fitch & Assoc.	714-951-0196
CO	Englewood, D.M. Harthun & Assoc.	303-792-5050
CT	Madison, Focus Elctrn. Sls.	203-245-2097
FL	Casselberry, Dyne-A-Mark Corp.	407-629-5557
IL	Schaumburg, Tech Tron Sls.	312-843-7530
IA	Cedar Rapids, Rep Assocs.	319-373-0152
KS	Parker, S.W. Wollard	913-898-6556
MD	Baltimore, Hagy Corp.	301-529-2022
MA	Taunton, Focus Elctrn. Sls.	617-824-3840
MI	Grand Rapids, JFCO (Finnegan & Co.)	616-949-1020
MN	Bloomington, Mumco	612-854-4161
NJ	Manville, Dynorep, Inc.	201-685-0135
NM	Albuquerque, Heath & Assocs.	505-296-8084
NY	Pittsford, Andres Comp. Sls.	716-381-3818
OH	Vandalia, JFCO (Finnegan & Co.)	513-890-8322
OR	Beaverton, Micro Sls.	503-645-2841
PA	Dresher, CMS Mktg.	215-885-4424
PA	Pittsburgh, JFCO (Finnegan & Co.)	412-823-5400
Can	Scarborough, Ont., Cantronics, LTD.	416-297-8668

STANDARD GRIGSBY INC., W. Gunther GMBH, Vimsberger Strasse 51, D 8500 Numberg 82, West Germany, Tel: 0911-65521, TELEX: 622351, FAX: 0911/6552-239

STANDARD INSERT CO., Penn Engrg. & Mfg. Corp., 419 Sargon Way, Horsham, PA 19044, Tel: 215-956-0350, FAX: 215-956-0366; Empl.: 7; *Sls. Mgr.:* Richard J. Kull

STANDARD MICROSYSTEMS, 35 Marcus Blvd., Hauppauge, NY 11788, Tel: 516-273-3100, TWX: 510-227-8898; FSC No.: 53848; Empl.: 500; *Sls. Mgr.:* William Seifert

STANDARD REFERENCE LABS, INC., See Koep Precision Standards, Inc.

STANDARD WIRE & CABLE CO., 1959 E. Cashdan St., Rancho Dominguez, CA 90220, Tel: 213-609-1811, 800-447-0006/821-527, TELEX: 65-3423, ESYLNK: 62931655, FAX: 213-609-1862; Empl.: 110; *Sls. Mgr.:* Dan Varvais; *Dist. Mgr.:* Jerry Gaither

STANDEX ELECTRONICS, Standex International, 4538 Camberwell Rd., Cincinnati, OH 45209, Tel: 513-871-3777, TELEX: 212066, FAX: 513-871-3779; FSC No.: 56402; Empl.: 450; *Sls. Mgr.:* Charles C. Johnson, VP Sls. ..... **A•1298; B•1629, 1844-1845**

Local Sales Offices & Reps

AL	Huntsville, R. W. Mitscher Co.	205-882-6050
AZ	Mesa, Sedco Sls.	602-461-9069
CA	Cupertino, Codella Mktg. Grp., Inc.	408-257-2561
CA	Granada Hills, C & W Comp. Sls.	818-368-4032
CO	Longmont, Butler Tech. Sls.	303-651-7703
CT	Beacon Falls, KSA of New England	203-729-6285
FL	Boca Raton, R. W. Mitscher Co.	305-368-3841
GA	Lawrenceville, R. W. Mitscher Co.	404-923-3239
IL	Arlington Hgts., Brainard-Wilson Mktg.	312-437-2700
IN	Granger, Gregory Sls. Co.	219-272-9626
MD	Edina, Jay Borman Sls. Co.	612-922-5525
MD	Laurel, R. W. Mitscher Co., Inc.	301-498-6090
MA	Sudbury, KSA of New England	617-443-5881
MI	Farmington Hills, W. R. Hummon & Assocs., Inc.	313-474-0661
NY	Clarence, R. W. Mitscher Co., Inc.	716-759-2350
NY	Red Hook, R. W. Mitscher Co., Inc.	914-758-8375
NY	Rochester, R. W. Mitscher Co., Inc.	716-227-0839
NY	Utica, R. W. Mitscher Co., Inc.	315-738-0383
NC	Raleigh, R. W. Mitscher Co., Inc.	919-848-0941
OH	Dayton, J. C. Hofstetter Co.	513-296-1010
OH	Medina, J. C. Hofstetter Co.	216-241-4880
OR	Portland, Components Technlg.	503-292-1518
PA	Wynnewood, Metz-Benham Assocs., Inc.	215-896-7300
TN	Johnson City, R. W. Mitscher Co., Inc.	615-929-7258
TX	Houston, B & R Elctrn. Sls. Corp.	713-682-5448
TX	Plano, B & R Elctrn. Sls. Corp.	214-985-0028
VA	Richmond, R. W. Mitscher Co., Inc.	804-264-6883
WI	Waukesha, Brainard-Wilson Mktg.	414-797-7940
Can	Toronto, Ont., Anbek Sls. Canada, Ltd.	416-253-0243

STANFORD APPLIED ENGRG. INC., 3520 De La Cruz Blvd., Santa Clara, CA 95054, Tel: 408-988-0700, TELEX: 408-727-6438; Empl.: 425; *Sls. Mgr.:* Donall J. Hogan; *Dist. Mgr.:* Leon Vermont

STANFORD RESCH. SYS., INC., 1290 D. Reamwood Ave., Sunnyvale, CA 94089, Tel: 408-744-9040, TELEX: 706891 SRS UD, FAX: 408-744-9049; *Sls. Mgr.:* Daniel R. Melick

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CT	New Milford, Ray Perron Co.	203-354-2569
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OH	Kettering, Ken Hoffman Co.	513-299-8448
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TX	Richardson, Barry Sls.	214-234-0255
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STAR MICRONICS, INC., OEM Division, 70-D Ethel Rd. W., Piscataway, NJ 08854, Tel: 201-572-9512; Empl.: 120; *Sls. Mgr.:* John Hurley; *Dist. Mgr.:* Chris Duffy ..... **D•1058-1063, 1112-1113**

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EXP	Markham, Ont., Birde Mktg.	416-477-7722

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OH	Solon, Reptron Elctrns.	216-349-1415
OH	Worthington, Reptron Elctrns.	614-436-6675
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WA	Kent, Pyramid Elctrns.	206-872-5800

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NY	Plainview, A.C.I. Elctrns.	516-293-6630
NY	Rochester, Requa Elec. Co.	716-475-1600
OH	Akron, Aesco Elctrns., Inc.	216-762-8818
PA	Philadelphia, PEI/Genesis	215-673-0400
SC	Greenville, EMSCO (Hammond)	803-233-4121
TN	Nashville, Electra Distrbg. Co.	615-256-0800
TX	Dallas, Associated Aircraft	214-331-4381
WV	South Charleston, Allied Controls Co.	304-768-7313

FAX: 803-393-7843

STRUTHERS-DUNN INDUSTRIAL & COMMERICAL RELAYS, Sub. of Nytronics, Inc., 700 Orange St, Darlington, SC 29532, Tel: 803-393-5421; Empl.: 450 ..... **B•1634-1639**

Local Sales Offices & Reps

AL	Huntsville, Rep, Inc.	205-881-9270
AZ	Scottsdale, BSE, Inc.	602-483-0373
CA	Los Angeles, Wiley Co.	213-666-1611
CA	Palo Alto, Mollard Mktg.	415-961-0456
CO	Denver, Lindberg Co.	303-758-9033
CT	Bloomfield, Zaslow Sls. Co.	203-242-7781
FL	Orlando, Comp. Design Mktg.	407-352-5480
GA	Tucker, Rep, Inc.	404-938-4358
IL	Downers Grove, Rockford Controls Co.	312-960-2046
IN	Indianapolis, Rockford Controls Co.	317-876-3360
KS	Olathe, Advanced Tech Sls.	913-782-8702
LA	Lafayette, Kemp Engrg.	318-269-9452
MD	Columbia, L.D. Lowery Inc.	301-381-0225
MI	Southfield, L.H. Dickelman Co.	313-353-8210
MN	Minneapolis, HMR, Inc.	612-888-2122
MO	St. Louis, Advanced Tech. Sls.	314-878-2921
NJ	West Caldwell, Grimm, Siegel Assocs.	201-575-9300
NM	Albuquerque, B.S.E.	505-293-2582
NY	Buffalo, H.C. Zang Agency	716-877-3677
NC	Charlotte, J. Rudisill Assocs.	704-377-6901
OH	Cincinnati, Stegman Blaine Mktg. Co.	513-729-1969
PA	Broomall, L.D. Lowery, Inc.	215-356-5300
PA	Pittsburgh, R.F. Clark Co.	412-242-9500
TN	Memphis, Lesley & Assocs.	901-755-9492
TX	Euless, W. Pat Fralia Co.	817-354-1144
WA	Bellevue, Eltech, Inc.	206-643-4330
Can	Don Mills, Ont., R.D. Assocs.	416-444-0959
Can	Scarborough, Ont., Renfrew Elec. Co., Ltd.	416-752-4611

Local Distributors

AL	Decatur, M-G Elctrns. & Equip.	205-355-6121
AL	Montgomery, Southern Controls, Inc.	205-277-5030
CA	San Diego, Johnstone Supply	619-298-7168
CA	Santa Ana, Norstan Elctrns. Inc.	714-540-4165
CA	Santa Monica, Master Distrs.	213-452-1229
CO	Aurora, Comp. Specialties, Inc.	303-341-0160
CT	Wallingford, Sager Elec Supp. Co.	203-265-4600
FL	Orlando, T & T Prods., Inc.	407-857-2282
GA	Atlanta, Brownell-Electro, Inc.	404-762-5181
IL	Chicago, Newark Elctrns. Corp.	312-784-5100
IN	Ft. Wayne, Bell Inds., Inc.	219-423-3422
MA	Harrahan, M-G Electrns. & Equip. Co.	504-733-0070
MA	Woburn, Apparatus Svce. Co.	617-933-5999
MN	Fridley, Voyager Elctns. Corp.	612-571-7766
MO	Maryland Hgts., L Comp. Inc.	314-291-6200
NJ	Audubon, Universal Elctrns. Supp.	800-327-3529
NJ	Oakland, Relay Specialties, Inc.	201-337-1000
NY	Plainview, A.C.I. Elctrns.	516-293-6630
NY	Rochester, Requa Elec. Co.	716-475-1600
OH	Akron, Aesco Elctrns., Inc.	216-762-8818
PA	Philadelphia, PEI/Genesis	215-673-0400
SC	Greenville, Emsco	803-233-4121
TN	Nashville, Electra Distrbg. Co.	615-256-0800
TX	Dallas, Assocd. Aircraft	214-331-4381
WV	South Charleston, Allied Controls Co.	304-768-7313
IA	Cedar Rapids, Advanced Tech. Sls.	319-365-3150

ST-SEMICONDUCTORS OF INDIANA, INC., 415 N. College Ave., P.O. Box 609, Bloomington, IN 47402-0609, Tel: 812-332-1435, TWX: 810-351-1384; Empl.: 100; *Sls. Mgr.:* Roscoe Myers; *Dist. Mgr.:* Roscoe Myers

SUCKLE CORP., 733 Davis St., Dept. EM, Scranton, PA 18505, Tel: 717-346-3871, FAX: 717-346-1612; Empl.: 220; *Sls. Mgr.:* James J. Castellino

Sullins

FAX: 619-744-6081

SULLINS ELECTRONICS CORP., P.O. Box 189, 801 E. Mission Rd., San Marcos, CA 92069, Tel: 619-744-0125, TWX: 910-322-1472, ESYLNK: 62912413; Empl.: 100; *Sls. Mgr.:* Judy Evans; *Dist. Mgr.:* Ken Flagg ..... **C•1530-1531**

Local Sales Offices & Reps

AZ	Phoenix, O'Donnell Assocs.	602-944-9542
CA	La Canada, K.C.P. Ent.	818-796-1813
CA	San Diego, CK Assocs.	619-279-0420
CA	Santa Clara, Nova-Tronix	408-727-9530
CA	Santa Clara, Nova-Tronix, Inc.	408-727-9530
CO	Wheatridge, Cluff & Assocs.	303-423-9345
FL	Casselbery, Southern Elctrn. Mktg.	305-831-2822
GA	Lithia Springs, Effective Mktg. Force	404-948-6023
IL	Elmhurst, Utronix Sls., Inc.	312-834-1100
IN	Indianapolis, John Sukup Inc.	317-253-5501
KS	Shawnee Mission, M-S-B Assoc.	913-432-2131
MD	Laurel, CSDS, Inc.	301-490-3800
MA	Harvard, Cycle Sls.	617-456-6868
MN	Minneapolis, RK Sls. Assocs., Inc.	612-571-1001
NJ	Medford, Comp. Consultants	609-654-5300
NY	Valley Stream, HLJ Comp-Tech	516-599-2999
OH	Centerville, Omega Sls., Inc.	513-434-5507
TX	Allen, Bozman & Assocs.	214-578-1780
WA	Redmond, Elctrn. Mktg. Grp.	206-882-0962
WI	Oconomowoc, Artmor Ltd.	414-367-8789
Can	Scarborough, Ont., R-Tronics	416-299-6676

Local Distributors

AL	Birmingham, American Elctrn. Supp.	205-942-4656
AZ	Phoenix, Arizona Comps.	602-269-5655
CA	Burbank, Atwater Elctrns.	818-841-9050
CA	Pasadena, Empire Elctrns.	213-681-2711
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CA	Simi Valley, Lee Johnson Sls.	818-346-5412
CO	Arvada, Denver Beta Wintronic	303-431-7161
CT	Bridgeport, Millenium Elctrn. Sls.	203-372-2037
FL	Winter Park, Deanco	305-671-5100
GA	Marietta, Deanco	404-429-0126
IL	Carol Stream, Lectro Comps.	312-690-0520
IL	Chicago, NEP Elctrns.	312-625-8400
IN	Ft. Wayne, Graham Elctrns.	219-423-3422
IA	Cedar Springs, Barton Digital	319-474-2247
MD	Gaithersburg, Axis Elctrns., Inc.	301-840-9640
MA	Canton, EPC Elctrns. Inc.	617-821-2111
MI	Farmington Hills, Advent Elctrns.	313-477-1650
MI	Grand Rapids, Calder Elctrns.	616-698-7400
MN	St. Paul, Shelley Ragon Inc.	612-642-2828
MO	Independence, Shelley-Ragon, Inc.	816-254-3410
NH	Hampstead, Astrum Elctrns.	603-329-9640
NJ	Fairfield, Deanco	201-575-7960
NJ	Union, Meridian Supp.	201-687-6220
NM	Albuquerque, Electronic Parts	505-293-6161
NY	Ithaca, Deanco	607-257-4444
NY	Valley Stream, Forejay Assocs.	516-599-2999
NC	Hickory, Southeastern Elctrns., Inc.	919-828-2311
OH	Solon, REH Elctrns.	216-248-1636
OH	Twinsburg, Schuster Elec. Co.	216-425-8134
OR	Portland, Dunn Elctrns.	503-285-0214
PA	McKean, Advacom	814-476-7774
RI	Warwick, Cal-Greg Comps., Inc.	401-884-5101
TN	Knoxville, Indl. Elctrns., Inc.	615-573-7135
TX	Addison, Connec/Tek, Inc.	214-733-4411
TX	Dallas, Cypress Elctrns.	214-869-1435
UT	Salt Lake City, S.L.C. Wintronics	801-483-1882
VA	Virginia Bch., Deanco	804-499-3322
WA	Renton, Carlye	206-251-0700
WI	Oconomowoc, G.W. Elctrns., Ltd.	414-367-6003
Can	Pointe Claire, Que., A. R. Gray & Assocs.	514-694-6378

SUMITRONICS, INC., Sumitomo Corporation, 580 N. Pastoria Ave., Sunnyvale, CA 94086, Tel: 408-737-7683, TELEX: 278869; FSC No.: 408-737-9189; Empl.: 40; *Sls. Mgr.:* Ken Fujii

SUMMAGRAPHICS CORP., 60 Silvermine Rd., Seymour, CT 06483, Tel: 203-881-5400, TELEX: 964348, FAX: 203-881-5367; FSC No.: ;;;203-881-5367; Empl.: 170; *Sls. Mgr.:* Randy Ringer; *Dist. Mgr.:* Randy Ringer

FAX: 618-654-2351

SUMMIT ELECTRONICS, Basler Electric, Box 269, Route 143, Highland, IL 62249, Tel: 618-654-2341, 800-645-2074 ..... **D•2062**

Local Sales Offices & Reps

AL	Huntsville, CMR Assocs.	205-883-5991
AZ	Tempe, Trembly Assoc., Inc.	602-967-2058
CA	San Jose, Sourcetronics, Inc.	408-988-8801
CA	Westlake VL, CAL-Rep	818-991-1940
CO	Wheat Ridge, Trembly Assocs., Inc.	303-421-8900
FL	Winter Springs, Sunland Assocs.	305-365-9533
IL	Chicago, Kingston Comps.	312-477-7800
IN	Bloomington, Meta Tech. Sls., Inc.	317-240-5447
IA	Cedar Rapids, Tech. Elctrns.	319-366-5443
KS	Overland Park, Thomas L. Dowell & Assoc., Inc.	913-648-7373
MA	Whitinsville, Power Factor & Assocs.	617-234-6415
MI	Plymouth, Leading Edge Sls. Corp.	313-420-3344
MN	Minneapolis, Electro Serve	612-338-3475
MO	St. Louis, Thoman L. Dowell & Assoc., Inc.	314-849-4234
NV	Las Vegas, Trembly Assoc., Inc.	702-739-9770
NJ	Upper Montclair, T & K Sls.	201-783-3112
NM	Albuquerque, Trembly Assocs.	505-266-8616
NY	Canandaigua, Mamula Sls.	716-394-5560
NY	Smithtown, T & K Sales	516-724-3456
OH	Aurora, Meta Tech. Sls., Inc.	216-562-8772
PA	Exton, Linear Sls.	215-524-8080
TX	Houston, Barry Sls.	713-784-5860
TX	Richardson, Barry Sls.	214-234-0255
UT	N. Salt Lake City, Trembly Assocs.	801-295-4703
VA	Richmond, Glasscock & Assocs.	804-740-0063
WA	Redmond, Elctrn. Mktg. Grp.	206-882-0962
Can	Mississauga, Ont., T.W. Wilson Sls.	416-677-8200

SUNBANK ELECTRONICS, 1740 Commerce Way, Paso Robles, CA 93446, Tel: 805-238-2840, TWX: 910-351-5805; FSC No.: 07418; Empl.: 260; *Sls. Mgr.:* Denis Connolly; *Dist. Mgr.:* Robert Haldeman

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SUNDSTRAND DATA CONTROL INC., Sundstrand Corporation, P. O. Box 97001, Redmond, WA 98073-9701, Tel: 206-885-3711, TELEX: RCA 286144; Empl: 2000

SUN SYSTEMS

FAX: 305-587-0450

SUN ELECTRONIC SYSTEMS, INC., 1601 NW 38th Ave., Ft. Lauderdale, FL 33311, Tel: 305-587-5577; Empl: 10; *Sls. Mgr.:* Veronica L. Pasqua ..... **D•1208**

Local Sales Offices & Reps

CA	Montrose, Luscombe Engrg.	213-684-2000
CT	New Milford, D & R Controls	203-355-0921
FL	Orlando, Sci. Dvcs.	407-841-8180
NJ	Marlton, Analectro, Inc.	609-983-1088
TX	Austin, Ledbetter-Neal Assocs.	512-835-6642
Can	Edmonton, Alberta, Dycor Indl. Resch.	403-486-0091

SUN-FLEX CO., INC., 20 Pimentel Ct., Novato, CA 94947, Tel: 415-883-1221, TELEX: 172-208; *Sls. Mgr.:* David Render; *Dist. Mgr.:* David Render

SUN RESEARCH, INC., Box 210, Old Bay Rd., New Durham, NH 03855, Tel: 603-859-7110, TWX: 510-297-4444; *Sls. Mgr.:* Paul A. Blaisdell

SUNRISE ELECTRONICS, INC.

FAX: 818-914-1583

SUNRISE ELECTRONICS, INC., 524 S. Vermont Ave., Glendora, CA 91740, Tel: 818-914-1926, TWX: 910-584-3847; Empl.: 10; *Sls. Mgr.:* Allan V. Carey ..... **D•1348**

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WA	Renton, West Coast Reps	206-235-7042

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SUNSHINE SCIENTIFIC INSTRUMENTS, 1810 Grant Ave., Philadelphia, PA 19115, Tel: 215-673-5600; Empl.: 35; *Sls. Mgr.:* Al Stiles 688, 698, 730, 795, 807, 830

SUPERIOR CARBON PRODUCTS, INC., 101 HWY 35, Superior Pl., Walnut Grove, MS 39189, Tel: 601-253-2442, FAX: 601-253-2430; Empl.: 61; *Sls. Mgr.:* Paul Merrill Kling

SUPERIOR ELECTRIC, 383 Middle St., Bristol, CT 06010, Tel: 203-582-9561, TELEX: 962-446, TWX: 710-454-0682; FSC No.: 58474; Empl.: 800; *Sls. Mgr.:* Charles Ritter/James Hayden; *Dist. Mgr.:* Edward Crofton/Michael Miga ... **A•2462-2463; B•1306-1307; C•1532; D•2233**

Local Sales Offices & Reps

MS	Jackson, Doby Assocs.	601-981-1138
NM	Albuquerque, Fry Gates, Inc.	505-262-1525

SUPERTEK

FAX: 312-981-9076

SUPERTEK ELECTRONICS, INC., 543 W. Algonquin Rd., Arlington Heights, IL 60005, Tel: 312-981-5655, TELEX: 910-687-2847; Empl.: 10; *Sls. Mgr.:* Pat Morito; *Dist. Mgr.:* Pat Morito ..... **D•2063-2065**

Local Sales Offices & Reps

AZ	Scottsdale, SMS & Assocs.	602-998-0831
CA	Redwood City, Sales One	415-369-3677
CA	Sunnyvale, Esco Assocs.	408-745-1410
CO	Parker, TMA/Colorado	303-841-3435
FL	Largo, Stellmach Elctrns. Sls.	813-593-0319, 904-288-2365
GA	Lawrenceville, Tek-Rep Mktg.	404-963-1600
IL	Palatine, Golbeck Milota Assocs., Inc.	312-705-0602
IN	Richmond, Preston Mktg., Inc.	317-935-0141
MI	Livonia, Megatronix Intl. Corp.	313-462-2100
NH	Londonderry, Bennetron	603-432-9092
NC	Pinehurst, Tek-Rep Mktg.	919-295-2432
PA	Harleysville, Thomas Jackson Assoc., Inc.	215-256-8877
TX	Austin, John B. Guenther, INc.	512-258-0004
TX	Dallas, John B. Guenther, Inc.	214-691-8500

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SUPER VEXTA, 2701 Plaza Del Amo, Ste. 702, Torrance, CA 90503-7395, Tel: 213-515-2264, TELEX: 664231; Empl.: 4 ..... **B•1290, 1293**

Local Sales Offices & Reps

AZ	Phoenix, Indl. Elctrns. & Controls	602-894-2375
CA	El Toro, Distributed Motion	714-855-9902
CA	San Carlos, Campbell & George	415-594-1994
CA	Santa Clara, Oriental Motor U.S.A. Corp.	408-988-2655
CO	Wheatridge, Control Dvcs.	303-424-9332
FL	Altamonte Springs, Automation Sls. Inc.	305-869-6535
IL	Elk Grove Vl, General Controls Inc.	312-595-2152
IL	Rolling Meadows, Oriental Motor U.S.A. Corp.	312-577-0310
IN	Indianapolis, Farrel-Argasta Elec. Co.	317-546-4041
IA	W. Des Moines, Ramco Elec. Co.	515-225-6933
MA	N. Andover, Bagley Intl.	617-688-0062
MI	Troy, Axis Sys.	313-689-7575
MN	Minnetonka, Vericom Corp.	612-933-0520
MO	St. Louis, Neff Power Inc.	314-727-6200
NJ	Clifton, Faber Equip.	201-773-8900
NJ	Fairfield, Oriental Motor U.S.A. Corp.	201-882-0480
NY	Rochester, John M. Forster Co.	716-232-5410
NC	Charlotte, EMCO Inc.	703-372-8281
OH	Cincinnati, Tapco Prods. Inc.	513-683-4481
PA	Broomall, Controlled Drives, Inc.	215-328-9515
TX	Denton, Texonics Inc.	214-260-3403
Can	Mississauga, Ont., Waffle's Elec.	416-672-0822

SUPPORT SYSTEMS INTL. CORP., 150 South Second St., Richmond, CA 94804, Tel: 415-234-9090, TWX: 910-382-8130, FAX: 415-233-8888; Empl.: 105; *Sls. Mgr.:* Richard St. John; *Dist. Mgr.:* Richard St. John

SURGEONICS LIMITED, One Sullivan Parkway, Fort Edward, NY 12828, Tel: 518-747-2156, FAX: 518-747-2607; Empl.: 20; *Sls. Mgr.:* R. Thomas

SURON MAAGAN MICHAEL, Kibbutz Maagan-Michael, D.N. Menashe 37805, Israel, Tel: 06-394211, TELEX: 471468 SURON IL, FAX: 063-90296; Empl.: 38; *Sls. Mgr.:* Gershon Peleg

SUSCO ELCTRNS., 70D Carolyn Blvd., Farmingdale, NY 11735, Tel: 516-249-4848, FAX: 516-249-4865

SUTTON DESIGNS, INC., 300 N. Tioga St., Ithaca, NY 14850, Tel: 607-277-4301, FAX: 607-277-6983; FSC No.: 6625; Empl.: 16; *Sls. Mgr.:* Adrienne Letson

SWISS JEWEL COMPANY, 406 Lafayette Building, Philadelphia, PA 19106, Tel: 215-925-2867, 800-922-0118, TELEX: 831-368, FAX: 215-922-3055; Empl.: 5; *Sls. Mgr.:* P. N. Steel, Jr.

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Local Sales Offices & Reps

AL	Huntsville, DHR Mktg.	205-722-0440
AZ	Phoenix, Moss Mktg.	602-957-2065
CA	Los Angeles, Wiley Co.	213-666-1611
CA	San Diego, Wiley Co.	619-453-9018
CA	Santa Clara, Ross Mktg. Assoc.	408-988-8111
CO	Denver, Moss Mktg.	303-455-7205
CT	Stamford, Unesco/Genex	203-322-9308
GA	Atlanta, DHR Mktg. Inc.	404-451-9848
IL	Chicago, Switchcraft Inc.	312-792-2700
IN	Indianapolis, Marketing Engrs.	317-872-5665
KS	Overland Park, Thomas L. Dowell & Assoc.	913-648-7373
MA	Waltham, Unesco/Genex	617-890-1535
MI	Farmington Hills, Carter, McCormic & Peirce	313-477-7700
MN	Edina, Mel Foster Tech. Sls.	612-941-9790
MS	Jackson, Doby Elctrns.	601-981-1138
MO	St. Louis, Thomas L. Dowell & Assoc.	314-849-4234
NJ	Cherry Hill, Trinkle Sls.	609-795-4200
NJ	Englewood Cliffs, Masin-Esco	201-569-8868
NM	Albuquerque, Moss Mktg.	505-292-7505
NY	Hauppauge, Masin-Esco	516-273-3500
NY	Rochester, Apex Assocs.	716-272-7040
NC	Raleigh, DHR Mktg., Inc.	919-829-1970
OH	Dayton, J. C. Hofstetter Co.	513-296-1010
OH	Medina, J. C. Hofstetter Co.	216-241-4880
OR	Milwaukee, Comtec	503-654-6626
SC	Greenville, DHR Mktg. Inc.	803-235-3594
TN	Memphis, Doby Elctrns.	901-365-9575
TX	Austin, J. Y. Schoonmaker Co.	512-327-5274
TX	Dallas, J. Y. Schoonmaker Co.	214-349-1650
TX	Houston, J. Y. Schoonmaker Co.	713-738-2427
UT	Salt Lake City, Moss Mktg.	801-363-5875
WA	Bellevue, Comtec	206-453-1188
WI	Burlington, Switchcraft	414-763-2100
Can	Toronto, Atlas	416-789-7761

SWITCHES UNLIMITED, INC., 34-11 56th St., Woodside, NY 11377, Tel: 718-478-5000, 800-221-0487, FAX: 718-672-6370; Empl.: 20; *Sls. Mgr.:* Douglas King

SWITCHING POWER INC., 3601 Veterans Hwy., Ronkonkoma, NY 11779, Tel: 516-981-7231, TWX: 510-220-1528, FAX: 516-981-7266; Empl.: 200

GA Norcross, Hughes Assocs. 404-662-1587
IL Mt. Prospect, Interep Inc. 312-577-8899
IN Kokomo, Schillinger Assocs. 317-455-2708
KS Kansas City, Delltron Co., Inc. 816-436-6445
MD Annapolis, Parogem, Inc. 301-269-1898
MI Grand Rapids, DEM Sls. 616-364-4024
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MI St. Clair Shores, DEM Sls. 313-777-1750
MN Bloomington, Horizon Technlg. Inc. ... 612-884-6515
MS Corinth, Hughes Assocs. 601-287-2915
MO Florissant, Delltron Co., Inc. 314-839-0033
NH Salem, Sales Engrg. Co. 603-893-5521
NJ Lodi, TRC Elec. Inc. 201-779-8282
NC Cary, Hughes Assocs. 919-467-7029
OH Cleveland, Comps. Inc. 216-243-9200
OR Beaverton, Advanced Power Prods. ... 503-646-0994
TN Nashville, Hughes Assocs. 615-871-0908
TX Houston, Barry Sls. 713-784-5860
TX Richardson, Barry Sls. 214-234-0255
VA Lynchburg, Parogem, Inc. 804-528-0681
WA Redmond, Advanced Power Prods. ... 206-885-0881
WI Milwaukee, Interep Inc. 414-774-1100
Can Burnaby, B.C., Advanced Power Prods. 604-435-3666
Can Pointe Claire, Que., A. R. Gray & Assocs. 514-694-6378

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OR Beaverton, Micro Power Elctrn. 503-694-5353

T&W SYSTEMS, INC., See Versacad Corp.

TANE ALARM PRODUCTS, 247-40 Jericho Tpke., Floral Park, NY 11001, Tel: 516-328-3351, FAX: 516-326-9125; Empl.: 10; *Sls. Mgr.:* Tab Hauser; *Dist. Mgr.:* Sam Lurie

TANSITOR ELECTRONICS, West Rd., P.O. Box 230, Bennington, VT 05201, Tel: 802-442-5473, TELEX: 954007, FAX: 802-447-1297; FSC No.: 030266626; Empl: 308; *Sls. Mgr.:* Dan Perreault; *Dist. Mgr.:* Dave Latchum

TAPECON, INC., 10 Latta Rd., Rochester, NY 14612, Tel: 716-621-8400; Empl.: 135

TAPESWITCH CORP. OF AMERICA, 100 Schmitt Blvd., Farmingdale, NY 11735, Tel: 516-694-6312, TELEX: 144611, FAX: 516-694-6304; Empl.: 100; *Sls. Mgr.:* Thomas Polistina

TAPPAN WIRE & CABLE, 256 Oak Tree Rd., Tappan, NY 10983, Tel: 914-359-9300, FAX: 914-359-9369; FSC No.: 2G330; Empl.: 27; *Sls. Mgr.:* Mike Ressa

TAUBER ELECTRONICS INC

FAX: 619-274-2220

TAUBER ELCTRNS. INC., 4901 Morena Blvd., Bldg. 314, San Diego, CA 92117, Tel: 619-274-7242; Empl.: 28; *Sls. Mgr.:* Bob Tauber; *Dist. Mgr.:* Pat Hoscoe ..... **D•1532**

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AL Huntsville, Macro-Marketing 205-883-9630
AZ Phoenix, MacDonald & Assocs. 602-998-1848
AZ Scottsville, Mactronix 602-998-1848
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CA Santa Ana, Berman Sls. 714-667-1023
GA Norcross, Marco Mktg. 404-662-5580
IL Wheeling, Ed Joyner & Co. 312-520-1200
IA Des Moines, Beams Co. 515-255-1148
KS Shawnee Mission, Beams Co. 913-631-0300

TAURUS COMPUTER PRODUCTS, DY-4 Systems Inc., 110-1140 Morrison Dr., Ottawa, Ont., Canada K2H 8S9, Tel: 613-596-3910, FAX: 613-596-0574; Empl.: 13; *Sls. Mgr.:* David Murray; *Dist. Mgr.:* David Murray

TAURUS CORPORATION, See Signal Research Inc.

TAYLOR ELECTRONICS, INC., 401 West Orion, Tempe, AZ 85283, Tel: 602-838-4523, FAX: 602-838-7456; Empl.: 25; *Sls. Mgr.:* Sharon F. Hansen

T-bar INCORPORATED
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T-BAR INCORPORATED, a Data Switch Co., 1 Enterprise Dr., Shelton, CT 06484, Tel: 203-926-1801, TWX: 710-463-3210; Empl.: 140; *Sls. Mgr.:* Gerard F. Ryan ..... **B•1850**

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AZ Tempe, Can Tec Sls. 602-345-1276
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IL Chicago, Newark Elctrns. 312-784-5100
CT Wallingford, Sager Elctrl. Supp. Co. 203-265-4600

T.D.I. BATTERIES, 2852 Hitchcock Ave., Downers Grove, IL 60515, Tel: 312-971-3460, TWX: 910-695-3222, FAX: 312-971-3903; Empl.: 100; *Sls. Mgr.:* Kurt Padera; *Dist. Mgr.:* Theresa Kanaga

TDJ CO., INC., 1154 Morena Blvd., San Diego, CA 92110, Tel: 619-276-5920; FSC No.: 60382; Empl.: 9; *Sls. Mgr.:* R. Scherr ..... **C•1102-1103**

TDK CORPORATION, Electronic Components & Material, 13-1, Nihonbashi, 1-Chome, Chuo-ku, Tokyo, Japan 103, Tel: (03) 278-5111, TELEX: J24270, TWX: J26937, FAX: (03) 278-5330; Empl.: 7,800; *Sls. Mgr.:* Motoyuki Kurihara; *Dist. Mgr.:* Tadashi Enami (TDK Corporation of America)
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CA San Jose, TDK Corp. of America 408-437-9585
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CA Torrance, TDK Corp. of America 213-539-6631
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IL Mt. Prospect, TDK Corp. of America ... 312-803-6100
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IN Indianapolis, TDK Corp. of America ... 317-872-0370
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NY Pt. Washington 516-625-0100
NC Greensboro 919-292-0012
NC Greensboro, TDK Corp. of America ... 919-292-0012
TX Irving 214-506-9800
TX Irving, TDK Corp. of America 214-506-9800
Can Ontario, M & H Intl. Corp. 416-676-9401

TDS, Tang Ind., 1965 Pratt Blvd., Elk Grove Village, IL 60007, Tel: 1-800-323-6648, 312-806-7240, FAX: 312-806-7222 ..... **A•1292**

TEAL ELECTRONICS CORPORATION, 9190 Camino Santa Fe, San Diego, CA 92121, Tel: 619-693-6000, 800-888-8325, FAX: 619-693-8325; Empl.: 50; *Sls. Mgr.:* Bill Carpenter, VP Mktg.

TEAM SYSTEMS, Div. of Toyo Spectrum, 2934 Corvin Dr., Santa Clara, CA 95051, Tel: 408-720-8877, TELEX: 297584 TEAM UR, FAX: 408-720-9643; Empl.: 11; *Sls. Mgr.:* Lucien Long ..... **D•1349**

Local Sales Offices & Reps
CA Anaheim, Exsell 714-978-1543
NY Port Chester, Radiation Elctrns. 914-937-2300

TECA, THERMOELECTRIC COOLING AMERICA CORP., 448 N. Halsted St., Chicago, IL 60622, Tel: 312-666-1600, FAX: 312-666-3964; Empl.: 50 ..... **C•1690-1691**

TECCOR ELECTRONICS INC

FAX: 214-550-1309

TECCOR ELECTRONICS, INC., 1801 Hurd Dr., Irving, TX 75038, Tel: 214-580-1515, TELEX: 79-1600; Empl.: 1000; *Sls. Mgr.:* Gerry Wiley ..... **A•2204-2207**

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IN Indianapolis, Elctrn. Rep, Inc. 317-894-1414
IN Mishawaka, Elctrn. Rep, Inc. 219-259-9365
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KS Olathe, SPS Assocs. Ltd. 913-764-4460
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NM Albuquerque, Sys. Sls. of Arizona Inc. 505-889-2901
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OH Dayton, Del Steffen & Assocs. 513-293-3145
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PA Carnegie, Del Steffen & Assocs. 412-276-7366
TN Greenville, Interep Assocs. Inc. 615-639-3491
TX Irving, Mike Farrar 214-580-1515
UT Salt Lake City, Electrodyne 801-264-8050
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WA Radar Elec.
WA Redmond, Quadra Sls. 206-883-3550
WI Wauwatosa, Larsen Assocs. 414-258-0529
Can Concord, Ont., Astec Comps. 416-669-4022
Can Saint Jerome,PQ, Astec Comps. 514-437-3527

Local Distributors
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FL Orlando, Hammond Elctrns. 407-849-6060
GA Norcross, Hammond Elctrns. 404-449-1996
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IN Indianapolis, Advent Elctrns. 317-872-4910
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LA Shreveport, Indl. Elctrns. Supp. 318-222-9459
MD Savage, Pyttronic Inds. 301-953-9650
MA Woburn, ACI Elctrns. 617-935-7230
MI Farmington Hills, Advent Elctrns. 313-477-1650
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NE Lincoln, Scott Elctrns. 402-466-8221
NJ Bloomfield, Solid State Inc. 201-429-8700
NJ Ironia, Mouser Elctrns 201-328-3322
NM Albuquerque, Bell Inds. 505-292-2700
NY Buffalo, Summit Distrs. 716-887-2800
NY Plainview, ACI Elctrns. 516-293-6630
NY Rochester, Simcona Elctrns. 716-328-3230
NC Greensboro, Hammond Elctrns. 919-275-6391
OR Portland, Radar Elc. Co. 503-232-3404
PA Export, Advacom Inc. 412-325-7551
PA Mc Kean, Advacom Inc. 814-476-7774
PA Montgomeryville, Pyttronic Inds. 215-643-2850
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WA Seattle, Radar Elec. Co. 206-282-2511
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WI Milwaukee, Marsh Elctrns. 414-475-6000
Can Burnaby, BC, RAE Indl. Elctrns. Ltd. ... 604-291-8866
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Can Edmonton, Alberta, Cardinal IND Elctrns. 403-483-6266
Can London, Ont., CM Peterson Co. 519-434-3204
Can Montreal, Que, Electronic Wholesalers 514-769-8861
Can Saskatoon, Sask., Cardinal Inds. 306-934-3443
Can Willowdale, Ont., Electro Sonic Inc. 416-494-1666

TECHDYNE, INC., Lance Wire & Cable Div., 380 Treadwell St., Hamden, CT 06514, Tel: 203-288-5571, TWX: 510-601-0470, FAX: 203-248-0256; Empl.: 50; *Sls. Mgr.:* Bill Kahler

TECH-ETCH, INC., 45 Aldrin Rd., Plymouth, MA 02360, Tel: 508-747-0300, TELEX: 989997, FAX: 508-746-9639; Empl.: 280; *Sls. Mgr.:* P. A. Thomas ..... **C•1720-1721, 1748**

TECH LABORATORIES INC., 500 10th St., Palisades Pk., NJ 07650, Tel: 201-944-2221, FAX: 201-944-1653; FSC No.: 83332; Empl.: 25; *Sls. Mgr.:* Nino M. Vlacich ..... **B•1851**

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CA Santa Clara, Mollard Mktg. 408-866-5950
GA Atlanta, Grady Duckett Sls. 404-451-3529
IL Glenview, Crimson Engrg. Co. 312-470-0024
KS Lenexa, Midtec Assocs. 913-541-0505
MA Norwood, Components Mktg. Svc. 617-762-4339
MI Jackson, N. Scroggs Co. 517-750-1170
MO St. Louis, Midtec Assocs. 314-275-8666
NJ Medford Lakes, Gray Assocs. 609-953-9109
NJ Whippany, Ken L. Love Assocs. 201-540-0204
NY Fairport, Net Sls. 716-223-1030
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PA Pittsburgh, VerHill Assocs. 412-241-5202
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Can Ottowa, Ont., Solid State Engrg. 613-737-0456
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TECHLAND BLUELYNX, 101 Winston St., Cumberland, MD 21502, Tel: 800-832-4526, TELEX: 961-134, FAX: 301-777-3307; *Sls. Mgr.:* Janine Filion

TECHMAR CORP., 2232 S. Cotner Ave., Los Angeles, CA 90064, Tel: 213-478-0046, 1-800-TECHMAR; FSC No.: 32597; Empl.: 12; *Sls. Mgr.:* Grant Reisfelt ..... **C•1105-1109**

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TECHNIC, INC., Box 965, Providence, RI 02901, Tel: 401-781-6100, TELEX: 927514; Empl.: 125; *Sls. Mgr.:* Andrew T. Ferris

TECHNICAL DEVICES, 560 Alaska Ave., Torrance, CA 90503, Tel: 213-618-8437, FAX: 213-618-1543; FSC No.: 04772; Empl.: 45; *Sls. Mgr.:* D. Murrin; *Dist. Mgr.:* D. Murrin

TECHNICAL MARKING SYS., See Autoroll Machine Corp.

TECHNICAL MATERIALS, INC., Sub. of Brush Wellman, Inc., 5 Wellington Rd., Lincoln, RI 02865, Tel: 401-333-1700, TWX: 710-384-0600, FAX: 401-333-2848; Empl.: 200; *Sls. Mgr.:* Kenneth Bennett

TECHNICAL PANELS, INC., 9162 La Rosa Dr., Temple City, CA 91780, Tel: 800-343-1170, FAX: 818-287-0420; Empl.: 14; *Sls. Mgr.:* William Roland

TECHNICAL RESEARCH & MFG., INC., See TRM, Inc.

TECHNICAL SERVICE LABORATORY INC., 95 Ready Ave., Ft. Walton Beach, FL 32548, Tel: 904-243-3722, FAX: 904-244-6653; FSC No.: 51283; Empl.: 24; *Sls. Mgr.:* Andrew J. Corbin

TECHNIPOWER, A PENRIL CO., P.O. Box 222, Commerce Pk., Danbury, CT 06813, Tel: 203-748-7001, TELEX: 710-456-9280, FAX: 203-797-9285; FSC No.: 13850; Empl.: 135; *Sls. Mgr.:* I. Bourgain (Variac); *Dist. Mgr.:* James McCarty ..... **A•2476; D•2081**

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TX Richardson, Scientific Sls. Co. 214-231-6541
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Local Distributors

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TECHNO, A DSG Company, 2101 Jericho Tunpike, New Hyde Park, NY 11040, Tel: 516-328-3970, TWX: 510-223-0642, FAX: 516-326-8827; Empl.: 85 ..... **B•1310-1311**

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TECHNOLOGY DYNAMICS INC., 100 School St., Bergenfield, NJ 07621, Tel: 201-385-0500; Empl.: 50; *Sls. Mgr.:* Mark S.Jacobus ..... **D•2082**

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Local Sales Offices & Reps

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CA	Santa Barbara, Tecknit (Western Facility)	805-963-5811
CA	Santa Clara, Nova-Tronix	408-727-9530
FL	Clearwater, Tech-Rep Assocs.	813-572-9900
GA	Duluth, Dixie Tech. Mktg., Inc.	404-381-5592
IL	Palatine, Technlg. Sls., Inc.	312-991-6600
IA	Cedar Rapids, Dy-Tronix Inc.	319-377-8275
MD	Rockville, Mechtronics Sls. Inc.	301-340-2130
MN	St. Paul, Repco	612-642-2828
MO	Bridgeton, Dy-Tronix Inc.	314-291-4777
NH	Hudson, EMC Sales	603-889-5751
NY	Binghamton, Empire Tech. Assocs., Inc.	607-772-0651
NY	Fairport, Empire Tech. Assoc.	716-425-3775
NY	Great Neck, Trionics Assocs.	516-466-2300
NY	Skaneateles, Empire Tech. Assoc.	315-685-5703
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OH	Dayton, Jay Engrg.	513-253-2151
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Can	Toronto, Norgay Entprs. LTD.	416-234-8966

TECNETICS, See Computer Products, Inc.

TECNETICS, Computer Products/Tecnetics, 6287 Arapahoe Ave., Boulder, CO 80306, Tel: 303-442-3837, FAX: 303-444-9437

Refer to Computer Products, Inc., Pompano Beach, FL for sales offices, Reps. and Distributors.

TECO CORP., Bay Rd., P. O. Box A, Winnisquam, NH 03289, Tel: 603-524-1998, FAX: 603-524-1899; Empl.: 40-50; *Sls. Mgr.:* Sandra Murphy

TECOM INDUSTRIES, INC., 9324 Topanga Canyon Blvd., Chatsworth, CA 91311, Tel: 818-341-4010, TELEX: 69 8476, FAX: 818-718-1402; FSC No.: 59850001; Empl.: 134

TECTROL INC
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TECTROL, INC., 39 Kodiak Cres., Downsview, Ontario, Canada M3J 3E5, Tel: 416-630-8108; Empl.: 320; *Sls. Mgr.:* Len Klebanoff ..... **D•2083-2085**

Local Sales Offices & Reps

CA	Los Altos, PEI Assocs.	415-968-1803
CT	Framingham, Int'l Mktg. Grp.	508-788-0316
MA	Westboro, Bay Colony Reps.	617-870-1930
NJ	Ho-Ho-Kus, Alto Assocs.	201-447-1770
NY	Buffalo, Lynn Assocs.	716-631-0054
PA	Pittsburgh, Lynn Assocs.	412-443-3670
TX	Richardson, Interactive Comp. Sls.	214-669-2277
WI	Wauwatosa, Larsen Assocs., Inc.	414-258-0529
Can	Downsview, Ont., Tectrol Inc.	416-630-8108

TEGAL SCIENTIFIC, INC., Box 5905, Concord, CA 94524, Tel: 415-827-1054, TELEX: 380053, FAX: 415-827-1189; *Sls. Mgr.:* L. Rigali

TEGAM, INC., 7230 N. Ridge Rd., Madison, OH 44057, Tel: 216-428-7505, TELEX: 205188 TEGAM MSON, FAX: 216-428-1068; Empl.: 25; *Sls. Mgr.:* Robert A. Rodella

TEKA an Interplex Industries company
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FAX: 401-461-2310

TEKA INTERCONNECTION SYSTEMS, 45 Salem Dr., Providence, RI 02907, Tel: 401-785-4110, TWX: 710-381-1606; Empl.: 89; *Sls. Mgr.:* Barry Manchester; *Dist. Mgr.:* Barry Manchester ..... **C•1538-1541**

Local Sales Offices & Reps

CA	Downey, Management Mktg. & Sls.	213-560-5584
CA	Sunnyvale, W. W. Posey Co.	408-746-0771
CO	Boulder, R.G. Entprs., Inc.	303-447-9211
IL	St. Charles, May Assocs., Inc.	312-377-2320
MA	Danvers, C.H. Burnham Assoc.	508-774-0111
MN	Wayzata, Cardinal Sls.	612-475-0041
NJ	Pompton Plains, T. A. Adamo Sls.	201-835-5344
TX	Houston, Mil-Rep Assocs.	713-444-2557

Local Distributors

CA	Hayward, KEA Elctrns.	415-887-2900
CA	Irvine, Mann Southwest	714-380-4170
CA	Santa Ana, Norstan Elctrns.	800-854-8344
CA	Santa Clara, Cypress Elctrns.	408-980-2500
MA	Andover, Aved Elctrns.	617-688-3800
MA	Canton, E.P.C., Inc.	617-821-2111
MI	Roseville, Madsion Elctrns.	313-778-7640
MN	St. Paul, Shelley-Ragon, Inc.	612-642-2844
NY	Farmingdale, Pride Elctrns.	516-293-4020
NY	Ronkonkoma, Conco Elctrns.	516-467-8200
NC	Raleigh, Resco Raleigh	919-781-5700
OH	Centerville, I.P.D., Inc.	513-435-2086
TX	Allen, Prime Distbn.	214-231-0170
TX	Dallas, Cypress Elctrns.	214-869-1435
WA	Seattle, Shelley Ragon, Inc.	206-241-1980

TEKTRONIX, INC., P.O. Box 500, 76/260, Beaverton, OR 97077, Tel: 800-835-9433, TELEX: 151754, FAX: 503-657-5502; FSC No.: 80009; Empl.: 16,000

TEKTRONIX, INC., Display Devices Operation, P. O. Box 500, Beaverton, OR 97077, Tel: 503 627 6868

TEKTRONIX-SIGNAL ANALYSIS UNIT, 1350 Dell Ave., No. 104, Campbell, CA 95008, Tel: 408-374-6464, FAX: 408-374-6467; *Sls. Mgr.:* Rick Wills

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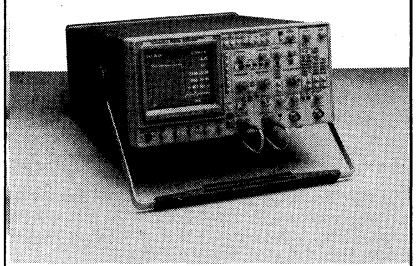

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TEKNATIONAL INDS., INC., 430 S. Clinton Ave., Rochester, NY 14620-1103, Tel: 716-232-1291, FAX: 716-232-1295; FSC No.: 24227; Empl.: 15; *Sls. Mgr.:* J. D. Hochheimer

TEKTONE SOUND & SIGNAL, 1331 S. Killian Dr., Lake Park, FL 33403, Tel: 407-844-2383, FAX: 407-845-1587; FSC No.: 59-1500771; Empl.: 70; *Sls. Mgr.:* Tom Hendricks; *Dist. Mgr.:* Tom Hendricks

TEKWORKS, INC., 72 Redner Rd., Morristown, NJ 07960, Tel: 201-540-1096, FAX: 201-540-9412; Empl.: 2; *Sls. Mgr.:* David A.H. Robinson ..... D•1351

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PA Doylestown, Technical Instr. Sls. 215-345-4110

TELCOM INTERNATIONAL, INC., See Hadron, Inc.

TELEBYTE TECHNOLOGY, INC., 270 East Pulaski Road, Greenlawn, NY 11740, Tel: 516-423-3232, 800-835-3298, TWX: 510-226-0449, FAX: 516-385-8184; Empl.: 48; *Sls. Mgr.:* J. Kramer; *Dist. Mgr.:* R. Nazario

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MD Rockville, Spectro Assocs. 301-294-9770
MN Wayzata, Comtel Midwest 612-476-1551
TX Ft. Worth, GMA Mktg. 817-834-2258
Can Nepean, Ont., Multitek, Inc. 613-226-2365

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AL Birmingham, Mid South Data 205-942-2453
CA San Rafael, Diversified Data Resources 415-499-8870
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GA Alpharetta, Codaram 404-664-3510
IL Palatine, Comprehensive Comm. Sys. 312-934-0580
MD Hanover, Vertex-CCP 301-796-5000
MN Minneapolis, On-Line Intl. 612-888-4444
MO St. Louis, Micro Prod. Sls. 314-576-7355
NJ Northvale, Glasgal Comms. 201-768-8082
NY Hauppauge, Data Path Prods. 516-273-3527
OH New Carlisle, R.W. Bowen 513-845-1880
OH Westlake, Arc Elctrn. 800-362-6883
OK Tulsa, Engrg. Design Grp. 918-622-1388
TN Memphis, Hitech Data 901-373-6041
Can Vancouver, CD Nova 604-430-5612

TELECOMMUNICATIONS TECHNIQUES CORP., 20410 Observation Drive, Germantown, MD 20874, Tel: 301-353-1550, FAX: 301-353-0734

TELECTRO SYSTEMS CORP., 96-18 43rd Ave., Corona, NY 11368, Tel: 718-651-8900, TWX: 510-601-8607 TELECTRO, FAX: 718-651-4103; FSC No.: 30040; Empl.: 50; *Sls. Mgr.:* H. Sussman

TELEDYNE AEROSPACE SYS., 1007 E. 10th St., Fairmont, MN 56031, Tel: 507-235-3355, TWX: 910-565-2120, ESYLNK: 62899301; FSC No.: 24600; Empl.: 230; *Sls. Mgr.:* Robert L. Johnson

TELEDYNE ANSONIA, Solderless Connector Div., One Riverside Dr., Ansonia, CT 06401, Tel: 203-735-9311, TELEX: 963408, ESYLNK: 62877180; FSC No.: 19724

TELEDYNE CRYSTALONICS, Teledyne Industries, Inc., 147 Sherman St., Cambridge, MA 02140, Tel: 617-491-1670, TWX: 710-320-1196, FAX: 617-547-6119; FSC No.: 12498;Multiple; *Dist. Mgr.:* W. J. Kilgarriff

TELEDYNE/GEOTECH, 3401 Shiloh Rd., Garland, TX 75041, Tel: 214-271-2561, TELEX: 170584; FSC No.: 99019; Empl.: 175

TELEDYNE GURLEY, 514 Fulton St., P.O. Box 88, Troy, NY 12181, Tel: 518-272-6300, TWX: 710-443-8156, FAX: 518-274-3660; *Sls. Mgr.:* G. S. Gordon

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CT Hamden, JBL Assocs. 203-281-3161
IL Hillside, Cadre Tech. Reps. 312-449-3900
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MD Columbia, Stein Instr. 301-596-3748
MA Holbrook, McLellan Assocs. 617-767-4771
MI Livonia, Lowell-Wendt Mktg. 313-464-2722
MN St. Paul, Northstar Motion & Control .. 612-770-5311
NY Buffalo, Good Comps. 716-634-4400
OR Portland, Fry Controls 503-244-3313
PA Cheltenham, Stein Instr. 215-379-1990
TX Richardson, Barger Engrg. 214-349-6171
Can Ottawa, Ont., Tech-Trad 613-727-1272

TELEDYNE INET, Teledyne, Inc., 1901 Avenue Of the Stars, Century City, Los Angeles, CA 90067, Tel: 213-325-5040, TELEX: 67-7228, FAX: 213-534-2274; FSC No.: 90911; Empl.: 485; *Sls. Mgr.:* Bruce Brady

TELEDYNE KINETICS, Div. of Teledyne, Inc., 410 S. Cedros Ave., Solana Beach, CA 92075, Tel: 619-755-1181, TELEX: 62877770; FSC No.: 06928; Empl.: 100; *Sls. Mgr.:* John Schuler

TELEDYNE MICROELECTRONICS, 12964 Panama St., Los Angeles, CA 90066, Tel: 213-822-8229, 213-870-9831, TWX: 910-343-7436; FSC No.: 16170; Empl.: 1500; *Sls. Mgr.:* W. Kennedy

TELEDYNE MICROWAVE, 1290 Terra Bella Ave., Mountain View, CA 94043, Tel: 415-968-2211, TWX: 910-379-6939, FAX: 415-966-1521; FSC No.: 24022; Empl.: 500; *Sls. Mgr.:* M. Lee

TELEDYNE RELAYS

FAX: 213-779-9161

TELEDYNE RELAYS, Teledyne, Inc., 12525 Daphne Ave., Hawthorne, CA 90250, Tel: 213-777-0077, TWX: 910-321-4610; FSC No.: 11532; *Sls. Mgr.:* Tom Garland ..... B•1640-1650

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CO Englewood, Thorson Rocky Mtn. 303-799-3435
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FL Clearwater, HHP Assocs., Inc. 813-797-4447
FL Pompano Beach, HHP Assocs., Inc. ... 305-971-5750
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GA Doraville, Advanced Comps. Mktg. 404-448-7025
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IN Kokomo, Schillinger Asso. 317-455-2708
IA Cedar Rapids, Stan Clothier Co. 319-365-1717
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WA Houston, Kruvand Assocs. 713-956-6741
UT Salt Lake City, Thorson Rocky Mtn. ... 801-973-7969
WA Seattle, Trekrep Elec. 206-286-2047
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Can Edmonton, Alb., Deskin Sls. 403-466-2106
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Can Ottawa, Ont., Deskin Sls. 613-729-1099
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Can Transcona, Man., Deskin Sls. 403-466-2106
Can Vancouver, Deskin Sls. 604-324-8343

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AL Huntsville, Pioneer Elctrns. 205-837-9300
AL Huntsville, Time Elctrns. 205-721-1133
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AZ Tempe, Time-Arizona 602-967-2000
CA Agoura Hills, Time Elctrns. 818-707-2890
CA Anaheim, Time-Anaheim 714-937-0911
CA Calabasas, Wyle 818-880-9000
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CA Chatsworth, Time 818-998-7200
CA Irvine, Wyle Dist. Grp. 714-863-9953
CA Rancho Cordova, Wyle 916-638-5282
CA San Diego, Time 619-586-1331
CA San Diego, Wyle Dist. Grp. 619-565-9171
CA Santa Clara, Wyle Dist. Grp. 408-727-2500
CA Sunnyvale, Time-N. Cal. 408-734-9888
CA Torrance, Time-West 213-320-0880
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MN Eden Prairie, Pioneer 612-944-3355
MN Edina, Time Elctrns. 612-835-1250
MO St. Louis, Time Elctrns. 314-391-6444
NJ Marlton, Milgray/Delaware Valley 609-983-5010
NJ Pinebrook, Time Elctrns. 201-882-4611
NY Buffalo, Summit Dist. 716-887-2800
NY E. Syracuse, Time Elctrns. 315-432-0355
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NY Pittsford, Milgray 716-385-9330
NY Rochester, Summit Dist. 716-334-8110
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OH Dayton, Pioneer/Dayton 513-236-9900
OH Dublin, Time Elctrns. 614-761-1100
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PA King of Prussia, Time Elctrns. 215-337-0900
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TX Dallas, Milgray 214-248-1603
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Can Vancouver, BC, Deskin Sls. 604-324-8343
Can Willowdale, Ont., Milgray Elctrns. 416-756-4481

TELEDYNE ROTOLITE, P.O. Box 398, Owen, WI 54460, Tel: 800-524-0105, TWX: 710-986-3017; *Sls. Mgr.:* J. F. Stickel

TELEDYNE RYAN ELECTRONICS, 8650 Balboa Ave., San Diego, CA 92123, Tel: 619-560-6400, TELEX: 695-028, TWX: 910-335-1174; Empl.: 600; *Sls. Mgr.:* J.E. Wallin

TELEDYNE SEMICONDUCTOR, 1300 Terra Bella Ave., PO Box 7267, Mountain View, CA 94039-7267, Tel: 415-968-9241, TWX: 910-379-6494, FAX: 415-967-1590; FSC No.: 15818; Empl.: 200

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AZ Phoenix, Sun State Tech. 602-220-0595
CA Agoura, Northern Tech. Sls. 818-991-0091
CA Fountain Valley, Dyna Rep. Inc. 714-545-3255
CA Mountain View, Teledyne Semiconductor 415-968-9241
CA San Diego, Bestronics 619-693-1111
CO Lakewood, CANDAL 303-935-7128
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MD Columbia, L.D. Lowery Inc. 301-381-0225
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MA Norwood, Teledyne Semiconductor ... 617-769-9420
MI Farmington Hills, Luebbe Sls. Co. 313-489-8828
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MO Florissant, HiTec Central Inc. 314-831-9377
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NY Rochester, Micro-Tech Mktg. 914-338-7588
NY Smithtown, North East Comps. 516-724-0310
NC Raleigh, EMA 919-847-8800
OH Cleveland, Luebbe Sls. Co. 216-333-0425
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PA Pittsburgh, Luebbe Sls. Co. 412-364-0490
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UT Bountiful, Anderson Assoc. 801-292-8991
WA Redmond, Electronic Engrg. Sls. 206-883-3374
WI Northbrook, Dolin Sls. Co. 414-482-1111

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CA El Monte, Marshall Inds. 818-459-5500
CO Denver, Integrated Elctrns. Corp. 303-292-6121
FL Altamonte Springs, Marshall Inds. 305-767-8585
FL Miami, All American 305-621-8282
FL Orlando, Chip Supp. 305-298-7100
IL Elmhurst, Semiconductor Specialists 312-279-1000
MA Framingham, Now Elctrns. 508-872-5876
MI Livonia, Chelsea Elec. Dis. Grp. 313-525-1155
TX Addison, Quality Comps. 214-733-4300
TX Dallas, Omni Pro Elctrns. 214-233-0500
Can Pointe Claire, Que., Future 514-694-7710

TELEDYNE SOLID STATE, A Div. of Teledyne Relays, 12525 Daphne Ave., Hawthorne, CA 90250, Tel: 213-777-0077, TWX: 910-321-4610, FAX: 213-779-9161; FSC No.: 63745; *Sls. Mgr.:* Tom Garland ..... **B•1644-1650**

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AL Huntsville, Advanced Comps. Mktg. ... 205-881-5493
AZ Scottsdale, Arcom Sls. 602-947-5745
CA Saratoga, Teledyne Solid State 408-996-9944
CO Englewood, Thorson Rocky Mtn. 303-799-3435
CT Stratford, Vista Assocs. 203-375-5456
FL Clearwater, HHP Assocs., Inc. 813-797-4447
FL Pompano Beach, HHP Assocs., Inc. ... 305-971-5750
FL Winter Pk., HHP Assocs., Inc. 305-740-0320
GA Doraville, Advanced Comps. Mktg. 404-448-7025
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MN Minneapolis, S. Clothier Co. 612-944-3456
MO St. Louis, RothKopf & Assocs. 314-961-4485
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NM Albuquerque, Reptronix 505-292-1718
NY Mount Vernon, Friedman-Smith Elctrns. 914-664-4866
NY Syracuse, LA. Hotze Co. 315-455-8807
OH Dayton, J. C. Hofstetter Co. 513-296-1010
OH Medina, J. C. Hofstetter Co. 216-241-4880
PA Cherry Hill, Vantage Sls. 609-424-6777
PA Hickory, J. C. Hofstetter Co. 412-356-2305
TX Austin, Kruvand Assocs. 512-441-6777
TX Dallas, Kruvand Assocs. 214-437-3355
TX Houston, Kruvand Assocs. 713-956-6741
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WA Seattle, Tekrep Elec. 206-286-2047
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Can Edmonton, Alb., Deskin Sls. 403-466-2106
Can Markham, Ont., Deskin Sls. 416-475-1412
Can Ottawa, Ont., Deskin Sls.. 613-729-1099
Can St. Laurent, Que., Deskin Sls. 514-331-2860
Can Transcona, Man., Deskin Sls. 403-466-2106
Can Vancouver, Deskin Sls. 604-324-8343

Local Distributors

AL Huntsville, Pioneer Elctrns. 205-837-9300
AL Huntsville, Time Elctrns. 205-721-1133
AZ Phoenix, Wyle 602-249-2232
AZ Tempe, Time Elctrns. 602-967-2000
CA Agoura Hills, Time Elctrns. 818-707-2890
CA Anaheim, Time Elctrns. 714-937-0911
CA Calabasas, Wyle 818-880-9000
CA Camarillo, Milgray/Los Angeles 805-484-4055
CA Chatsworth, Time Elctrns. 818-998-7200
CA Irvine, Wyle Dist. Co. 714-863-9953
CA Rancho Cordova, Wyle 916-638-5282
CA San Diego, Time Elctrns. 619-586-1331
CA San Diego, Wyle Dist. Grp. 619-565-9171
CA Santa Clara, Wyle Dist. Grp. 408-727-2500
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CO Thornton, Wyle Dist. Grp. 303-457-9953
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THERMOTECH DIV. OF MENASHA CORP., 1203 S. 5th St., Hopkins, MN 55343, Tel: 612-933-9400, FAX: 612-933-9412; Empl.: 605; *Sls. Mgr.:* Gene Christiansen

THERMOTRON INDUSTRIES, A Venturedyne, Ltd. Co., 291 Kollen Park Dr., Holland, MI 49423, Tel: 616-392-1491, TWX: 810-292-6164, FAX: 616-392-5643; *Sls. Mgr.:* John Condon/Don Lindeman

THETA-J CORPORATION, 8 Corporate Pl, 107 Audobon Rd., Wakefield, MA 01880, Tel: 617-246-4000, TELEX: 681-7300, FAX: 617-246-1356; Empl.: 75; *Sls. Mgr.:* William Riedel

THICKFILM INTERNATIONAL, Rt. 1-Box 85-0, Indian Head, MD 20640, Tel: 301-375-7400; Empl.: 21; *Sls. Mgr.:* P. Gundotra

THIELEX PLASTIC CORP., See ITW Thielex

THINCO DIV., HULL CORP., Davisville Rd., Hatboro, PA 19040, Tel: 215-672-7800, TELEX: 650-296-3800, FAX: 215-672-7807; FSC No.: 06405; Empl.: 8; *Sls. Mgr.:* John L. Hull

THIRD DOMAIN, INC., P.O. Box 17568, Tucson, AZ 85731-7568, Tel: 602-290-1820, TELEX: 275008; Empl.: 9; *Sls. Mgr.:* Kelli Dayton

THIRD WAVE INSTRUMENTS, INC., 268 B Cambridge St., Burlington, MA 01803, Tel: 617-273-0779, TELEX: MCI 6503065552; Empl.: 12; *Sls. Mgr.:* Daniel C. Wiswell

THOMAS & BETTS CORPORATION, 1001 Frontier Road, Bridgewater, NJ 08807, Tel: 201-685-1600, TELEX: 324899, TWX: 701-480-9230, FAX: 201-707-2704; FSC No.: 59730; Empl.: 2000; *Sls. Mgr.:* Rich Kampf ..... **C•1551-1553**

Local Sales Offices & Reps

CA	Irvine, Thomas & Betts Corp.	714-476-0430
CA	San Jose, Thomas & Betts Corp.	408-248-9111
IL	Naperville, Thomas & Betts Corp.	312-357-0404
MA	Norwell, Thomas & Betts Corp.	617-871-6204
Can	Mississauga, Ont., Thomas & Betts Corp.	416-888-1010

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AZ	Tempe, Time Elctrns.	602-967-2000
CA	Anaheim, Time Elctrns.	714-937-0911
CA	Chatsworth, Time Elctrns.	818-998-7200
CA	El Monte, Marshall Elctrns.	818-442-7204
CA	Irvine, Marshall Elctrns.	714-859-5050
CA	Milpitas, Marshall Elctrns.	408-493-9600
CA	Riverside, Elctrn. Supp.	714-683-7300
CA	Sacramento, Marshall Elctrns.	916-635-9700
CA	San Diego, Marshall Elctrns.	619-578-9600
CA	San Diego, Time Elctrns.	619-586-1331
CA	Sunnyvale, Time Elctrns.	408-734-9888
CA	Torrance, Time Elctrns.	213-320-0880
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CO	Thornton, Marshall Inds.	303-451-8383
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FL	Orlando, Time Elctrns.	305-841-6565
GA	Atlanta, Time Elctrns./Atlanta	404-448-4448
GA	Norcross, Marshall Elctrns.	404-923-5750
IL	Elk Grove Vl, Pioneer	312-437-9680
IL	Schaumburg, Marshall/Chicago	312-490-0155
IL	Wood Dale, Time/Chicago	312-350-0610
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MD	Columbia, Time Elctrns.	301-964-3090
MD	Gaithersburg, Marshall Inds.	301-840-9450
MD	Gaithersburg, Pioneer	301-921-0660
MA	Boston, Marshall Elctrns.	617-658-0810
MA	Peabody, Time Elctrns.	617-532-6200
MI	Grand Rapids, Pioneer	618-698-1800
MI	Livonia, Marshall/Michigan	313-525-5850
MI	Livonia, Pioneer/Michigan	313-525-1800
MN	Minnetonka, Pioneer	612-944-3355
MO	St. Louis, Time Elctrns.	314-391-6444
NJ	Pinebrook, Time Elctrns.	201-882-4611
NY	Farmingdale, Iris Elctrns.	516-420-8400
NY	Hauppauge, Time Elctrns.	516-273-0100
NY	Johnson City, Marshall Inds.	607-798-1611
NY	Mt. Vernon, QAR Indl. Elctrns.	914-699-2224
NY	Rochester, Marshall Inds.	716-235-7620
NY	Rochester, Simcona Elctrns.	716-328-3230
NY	Syracuse, Time Elctrns.	315-432-0355
NC	Charlotte, Pioneer	704-527-8188
NC	Charlotte, Time Elctrns.	704-522-7600
OH	Cleveland, Pioneer	216-587-3600
OH	Dayton, Marshall Inds.	513-898-4480
OH	Dayton, Pioneer	513-236-9900
OH	Solon, Marshall Inds.	216-248-1788
OR	Beaverton, Almac Elctrns.	503-629-8090
OR	Portland, Time Elctrns.	503-684-3780
PA	Horsham, Pioneer	215-674-4000
PA	King of Prussia, Time Elctrns.	215-337-0900
PA	Pittsburgh, Pioneer	412-782-2300
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WA Bellevue, Marshall Inds. 206-747-9100
WA Spokane, Almac Elctrns. 509-924-9500

THOMAS ELECTRONICS, INC., 100 Riverview Dr., Wayne, NJ 07470, Tel: 201-696-5200, TWX: 310-685-3326, FAX: 201-696-8298; FSC No.: ;01852; Empl.: 380; *Sls. Mgr.:* Bruce Piaget, VP Sls.

THOMSON ELECTRON TUBES & DEVICES CORP., Thomson CSF, 40 G Commerce, Totowa, NJ 07511, Tel: 201-812-9000, TWX: 710-987-7901, FAX: 201-812-9050; Empl.: 20; *Sls. Mgr.:* Victor Pastore

THOMSON ELECTRON TUBES & DEVICES CORP., Special Products Div., 550 Mount Pleasant Ave., Dover, NJ 07801, Tel: 201-328-1400, TWX: 510-601-3852, FAX: 201-328-1747; *Sls. Mgr.:* Patrick Stromboni

THOMSON PASSIVE COMPONENTS CORP., 6203 Variel Ave., Unit A, Woodland Hills, CA 91367, Tel: 818-887-1010, TELEX: 408067, TWX: 310-371-9759; Empl.: 150; *Sls. Mgr.:* Geoff Edge

THORDARSON MEISSNER, Components Corp. of Amer., Electronic Center, Mt. Carmel, IL 62863, Tel: 618-262-5121, TWX: 510-525-2254, FAX: 618-263-3150; FSC No.: 96256; Empl.: 600; *Sls. Mgr.:* Jim Andersen

THOR ELECTRONICS, 321 Pennsylvania Ave., Linden, NJ 07036, Tel: 201-486-3300, TELEX: 138 968, FAX: 201-486-0923; Empl.: 50; *Sls. Mgr.:* Jack Rose

THORN EMI ELECTRON TUBES INC., 23 Madison Rd., Fairfield, NJ 07006, Tel: 201-575-5586, TELEX: RCA 221236 TEGI, FAX: 201-575-8717; Empl.: 25; *Sls. Mgr.:* Michael R. Avery

THORN EMI TECHNOLOGY INC., 8601 Dunwoody Pl, Atlanta, GA 30350, Tel: 404-587-0017, 800-243-2572, FAX: 404-587-3791 ..... **D•1356**

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CA Sunnyvale 408-732-9027
CO Denver 303-841-5755
IL Chicago 312-530-7850
IN Indianapolis 317-842-1120
MA Andover 508-475-9332
NM Albuquerque 505-884-9644
OH Columbus 614-459-2890
PA Philadelphia 609-428-6060
TX Dallas 817-481-4087
VA Manassas 703-631-1766

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3M CO., see listing under letter "M"

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TIDEWATER TECHNOLOGICAL, INC., 611 Industrial Pk. Dr., Newport News, VA 23602, Tel: 804-874-2800, FAX: 804-874-7890; Empl.: 30

TIF INSTRUMENTS, INC., 9101 N.W. 7th Ave., Miami, FL 33150, Tel: 305-757-8811; Empl.: 500; *Sls. Mgr.:* Tom Wolff; *Dist. Mgr.:* Matt Marthinson

TII INDUSTRIES INC., 1385 Akron St, Copiague, NY 11726, Tel: 516-789-5000, TELEX: 144631, FAX: 516-789-5063; *Sls. Mgr.:* Jim Roach

TIL-TEK LIMITED, 500 Van Buren St, P.O. Box 550, Kemptville, Ontario, Canada K0G 1J0, Tel: 613-258-5928, TELEX: 053-4370, FAX: 613-258-7418; *Sls. Mgr.:* Hector Boudreau

TIMBER-TOP, Hopkins Rd., Box 517E, Watertown, CT 06795, Tel: 203-274-6706, FAX: 203-274-8041; FSC No.: 06773; Empl.: 5; *Sls. Mgr.:* W. E. Fischer

TIMECO, INC., 1035 - 26th St., P.O. Box 8038, Huntington, WV 25705, Tel: 304-523-5149; Empl.: 7; *Sls. Mgr.:* James E. Myers

TIME LOCK, INC., 87 Water Mill Lane, Great Neck, NY 11021, Tel: 516-487-0690, FAX: 516-487-0927; Empl.: 6; *Sls. Mgr.:* Ernie Odierna

TIME MARK CORP., 11440 E. Pine St., Tulsa, OK 74116, Tel: 918-438-1220, FAX: 918-437-7584; Empl.: 60; *Sls. Mgr.:* Steve Purple; *Dist. Mgr.:* Steve Purple

TIMEPLEX, INC., 400 Chestnut Ridge Rd., Woodcliff Lake, NJ 07675, Tel: 201-930-4600, TELEX: 178200, TWX: 710-990-7270; FSC No.: 7035-0001; Empl.: 1500; *Sls. Mgr.:* Alan Kazanoff

TITAN AC POWER SYSTEMS, See Compact Power Co.

TITCHENER, E. H., & CO., 1 Titchener Pl, Binghamton, NY 13902, Tel: 607-772-1161, TWX: 510-252-1985, FAX: 607-771-0264; Empl.: 235

TIW SYSTEMS, INC., 1284 Geneva Drive, Sunnyvale, CA 94089, Tel: 408-734-3900, TELEX: 346352, FAX: 408-734-8979; Empl.: 100; *Sls. Mgr.:* Debora Holt-Thompson (Amplifiers)

TL INDS. INC., 2541 Tracy Rd., Northwood, OH 43619, Tel: 419-666-8144, FAX: 419-666-6534; Empl.: 100; *Sls. Mgr.:* Ted Stechschulte

TMC SYSTEMS (ARIZ.) INC., See Dale Electronics, Inc.

TNR TECHNICAL, INC., 45 Jefryn Blvd. West, Deer Park, NY 11735, Tel: 516-242-4800; Empl.: 35; *Sls. Mgr.:* Jerrold Lazarus

TNR TECHNICAL, INC., 402-S. N. Lake Blvd., Altamonte Springs, FL 32701, Tel: 407-767-2411, FAX: 407-767-2414; Empl.: 8; *Sls. Mgr.:* Wayne Thaw

TOBE DEUTSCHMANN LABS., INC., 550 Turnpike St., Canton, MA 02021, Tel: 617-828-3366, FAX: 617-828-3048; FSC No.: 21966; Empl.: 30; *Sls. Mgr.:* T. Deutschmann, Jr.

TOCOSAMERICA

FAX: 312-364-7317

TOCOS AMERICA, INC., Tokyo Cosmos Electric Co., Ltd., 565 West Golf Road, Arlington Heights, IL 60005-3904, Tel: 312-364-7277; Empl.: 2,000; *Sls. Mgr.:* Joseph D. Tanney ..... **A•2144-2145**

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GA Norcross, Reptron Elctrns., Inc. 404-446-1300
FL Altamonte Springs, Semtronics Assocs., Inc. 407-831-8233,800-432-0200
FL Clearwater, Semtronics Assocs., Inc. .. 813-461-4675
FL Ft. Lauderdale, Semtronics Assocs., Inc. 305-731-2484
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IL Downers Grove, Mamak Sls. 312-963-6400
IN Indianapolis, DM Assocs. 317-842-4424
IA Cedar Rapids, Cahill, Schmitz & Howe, Inc. 319-377-8219
MD Randallstown, Chesapeake Indl. Mktg. 301-653-0476
MA Framingham, Gallagher Assocs., Inc. .. 508-626-2346
MI Grand Rapids, Miltimore Sls., Inc. 616-942-9721
MI Novi, Miltimore Sls., Inc. 313-349-0260
MN Minneapolis, Northstar Comps., Inc. ... 612-553-1888
NY Islandia, Schmitt Indl. Mktg. Corp. 516-582-5888
NY Pittsford, Franklin Sls. Corp. 716-248-8251
NC Raleigh, Micro Sls. Inc. 919-881-0007
OR Beaverton, Harry Levinson Co. 503-690-1312
PA Philadelphia, Check Assocs., Inc. 215-487-3007
TX Plano, B & R Elctrns. 214-985-0028
WA Seattle, Harry Levinson Co. 206-382-1300
Can Islington, Ont., Pipe Thompson Ltd. ... 416-236-2355
Can Montreal, Que., Versatech Electronique, Inc. 514-481-0196

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CA Van Nuys, EW Elctrns. 818-782-9020
FL Ft. Lauderdale, Reptron Elctrns., Inc. .. 305-735-1112
FL Tampa, Reptron Elctrns., Inc. 813-854-2351
GA Norcross, Reptron Elctrns., Inc. 404-446-1300
IL Schaumburg, QPS Elctrns., Inc. 312-884-6620
IL Schaumburg, Reptron Elctrns., Inc. 312-882-1700
IN Indianapolis, MAR Elctrns. 317-633-6699
MD Beltsville, Petricko Sls., Inc. 301-937-4960
MN Livonia, Reptron Elctrns., Inc. 313-525-2700
MN Minneapolis, K & H Elctrns. Distbg. Corp. 612-553-1312,800-328-8515
MN Minnetonka, Reptron Elctrns., Inc. 612-938-0000
NJ Kenilworth, Ventronics, Inc. 201-272-9262
NJ Whippany, ADI-American Dists., Inc. ... 201-428-0510
NY Buffalo, Summit Dists. 716-887-2800
NY Hempstead, Davis Elctrns. 516-483-9200
OH Cincinnati, Schuster Elctrns., Inc. 513-489-1400
OH Worthington, Reptron Elctrns., Inc. 614-436-6675
TX Austin, Southwest Elctrns., Inc. 512-837-8971
TX Dallas, Off the Shelf Comps. 214-247-0052, 800-231-8057
TX Dallas, Southwest Elctrns., Inc. 214-234-3050
TX Ft. Worth, C & W Elctrn. Supp. Co. 817-831-0395
TX Richardson, Comp. Technlg. Corp. 214-437-2211
TX Richardson, Off the Shelf Comps. 214-238-0808, 800-648-5387
TX Stafford, Southwest Elctrns., Inc. 713-240-4000
WA Seattle, KAM Division/Harry Levinson Co. 206-382-1300
WI Mequon, Lake-View Elctrns. Corp. 414-377-8250

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CA Irvine, Quadrep Southern 714-727-4222
CA San Diego, QuadRep Southern 619-560-8330
CA San Jose, Quantum Coefficient Sys. .. 408-432-1070
CO Englewood, Thorson Rocky Mtn. Inc. 303-799-3435
FL Clearwater, Glen White Assocs. 813-726-0577
FL Ft. Lauderdale, Glen White Assocs. ... 305-977-5885
FL Sanford, R.W. Mitscher Co. 305-322-7141
GA Norcross, Glen White Assocs. 301-321-7235
IL Arlington Heights, Coombs Assocs. ... 312-439-9810
MD Baltimore, Glen White Assocs. 301-321-7235
MA Hingham, Northeast Reps. 617-749-8700
MI Grand Rapids, JFCO 616-949-1020
MI Roseville, JFCO 313-771-8241
MN Minneapolis, R. K. Sales Assocs. 612-571-1001
MS Jackson, Glen White Assocs. 601-856-5411
MO Grandview, Harris-Hanson Co. 816-763-6200
MO St. Louis, Harris-Hansom Co. 314-432-3611
NH Nashua, Northeast Reps. 603-880-8199
NJ Princeton, Murtronic Assocs. 609-394-3737
NY Great Neck, F & F Metro Inc. 516-482-4080
NC Raleigh, Glen White Assocs. 919-848-1931
OH Cleveland, JFCO 216-398-6300
OH Gahanna, JFCO 614-476-3310
OH Vandalia, JFCO 513-890-8322
OR Portland, Quadrep Crown 503-620-8320
PA Pittsburgh, JFCO 412-823-5400
TN Gray, Glen White Assocs. 615-477-8850
TX Cedar Park, Aid Elctrns. 512-450-1938
TX Houston, AID Elctrns. Inc. 713-955-6204
TX Irving, AID Elctrs. Inc. 214-790-4761
UT Salt Lake City, Thorson Rocky Mtn. Inc. 801-973-7969
VA Lynchburg, Glen White Assocs. 804-385-6110
WA Bellevue, Quadrep Crown 206-643-8100
WI Milwaukee, Coombs Assocs. 414-351-6123
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Can Nepean, Ont., Electromate Indl. Sls. ... 613-829-6561
Can Repemtigny, Que., Electromate Indl. Sls. 514-582-2638
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TODD SYSTEMS, INC., 50 Ash St., Yonkers, NY 10701, Tel: 914-963-3400, FAX: 914-963-3506; Empl.: 45; *Sls. Mgr.:* S. Edwards ..... **A•2480-2483**

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CA San Francisco, Delray Distr. 415-777-4405
CT Norwalk, Park Distr. 203-853-2010
FL Miami, Gay Mar, Inc. 305-371-0765
FL Miami Bch., B. Frank Inc. 305-861-8227
GA Macon, Giga Corp. 912-745-2897
IL Skokie, Sargent Welch Inc. 312-677-0600
LA New Orleans, Bailey Distr. 504-943-2461
MD Bethesda, Albee Sls. 301-897-8088
MA Revere, Sozio's 617-547-6900
NJ Newark, Cotrapex, Inc. 201-589-1416

NJ Newark, Pinto Trading 201-344-7748
NY Long Island City, H. L. Dalis, Inc. 212-361-1100
NY New York, Gelb Sls. 212-475-7940
NY New York, Rosetta Elec. 212-233-9088
OH Dayton, K. Elctrns. 513-426-1877
PA Philadelphia, H & Z Sls. 215-912-2500
TX Houston, Cross & Co. 713-673-3100
TX Houston, Western Sls. 713-869-6671
VA Bailey's Crossroads, Arya Corp. 703-845-0800
WA Seattle, ForeigN Elctrns. 206-682-2761
WA Seattle, Pearl Elctrns. 206-622-6200
EXP NY, New York, Able Intl, Ltd. 212-696-5300

TOKIN AMERICA, INC., 155 Nicholson Ln, San Jose, CA 95134, Tel: 408-432-8020, FAX: 408-434-0375; Empl.: 15; *Sls. Mgr.:* Anthony R. Costarella; *Dist. Mgr.:* Anthony R. Costarella

TOKO AMERICA, INC., 1250 Feehanville Dr., Mt. Prospect, IL 60056, Tel: 312-297-0070, FAX: 312-699-7864; Empl.: 75; *Sls. Mgr.:* Jim Onodera; *Dist. Mgr.:* Mark Sullivan ..... **A•1276-1277, 1725; D•2132-2133**

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CA Irvine, Mission Ridge Mktg. 714-253-4626
CA San Diego, Varigon-San Diego 619-576-0100
CT Danbury, Toko America, Inc. 203-748-6871
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TN Rutledge, E.C.M. 615-828-5741

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TOPAZ, INC., 9192 Topaz Way, San Diego, CA 92123-1165, Tel: 619-279-0831, TWX: 910-335-1556, FAX: 619-569-8427; FSC No.: 06049; Empl.: 350; *Sls. Mgr.:* Dan Mathews, Dir. of Sls.; *Dist. Mgr.:* Dan Mathews, Dir. of Sls.

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TOPWARD INSTRUMENTS, Div. of Hauman, Inc., 2031 Ringwood Avenue, San Jose, CA 95131, Tel: 408-434-0888, TWX: 510-101-2820, FAX: 408-434-9832; Empl.: 100; *Dist. Mgr.:* Thomas C. Trieu

TORAD COIL CO., INC., 283 Linden Rd, Wayne, NJ 07470, Tel: 201-835-6195; *Sls. Mgr.:* Dan Gupta

TORELCO, INC., 14 Paine Ave., P. O. Box 560, Irvington, NJ 07111, Tel: 201-374-8641; Empl.: 20; *Sls. Mgr.:* Stewart H. Cook

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CA San Jose, Marketing Co. 408-259-7376
CA San Jose, Texel North 408-272-6836
CA Seal Beach, Texel 213-596-9411
IL Wheeling, Ed Joyner & Co. 708-520-1200
MA Southboro, Sullivan Tech. Sls. 508-485-2215
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VA Alexandria, Ed Leiby & Assocs. 703-360-9039

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FAX: 816-763-2278

TOROTEL PRODS. INC., 13402 S. 71 Hwy., Grandview, MO 64030-3199, Tel: 816-761-6314; Empl.: 250; *Sls. Mgr.:* H. Foland ..... **A•1303-1323, 2491-2496**

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CA Redwood City, Hickey Ind. Sls. 415-594-9978
CA Santa Ana, California Elctrn. Mktg. 714-835-2702
FL Orlando, Perrott Assocs. 407-830-0094
MN Minneapolis, QDC Inds. 913-341-2214
IL Chicago, Tristar Grp.,Inc. 312-593-0200
IN Greenwood, Valentine & Assocs. 317-888-2260
IA Hiawatha, Gassner & Clark Co. 319-393-5763
MD Towson, Dickison Sls. Co. 301-823-0923
MA Weston, John Goode Assocs. 617-235-3900
GA Atlanta, L&D, Inc. 404-395-7079
MO St. Louis, Abrams & Assocs. 314-569-0447
NY New Hyde Park, R. P. Luce & Co., Inc. 516-437-4550
NY Syracuse, Rep Tech. Inc. 315-437-2845
NC Raleigh, L & D, Inc. 919-876-5301
OH New Lebanon, J. N. Bailey & Assocs. 513-687-1325
CO Boulder, Stratford Grp. 303-530-3194
TX Dallas, Tycom Sls. Co. 214-960-7368
WI Brookfield, Tristar Grp., Inc. 414-782-2670
Can Toronto, Ont., Strategic Elctrns. 416-620-5381

TOROTRON CORP., 519 South Fifth Ave., Mt. Vernon, NY 10550, Tel: 914-664-2050; Empl.: 14; *Sls. Mgr.:* Miriam Zanger ..... **D•1357**

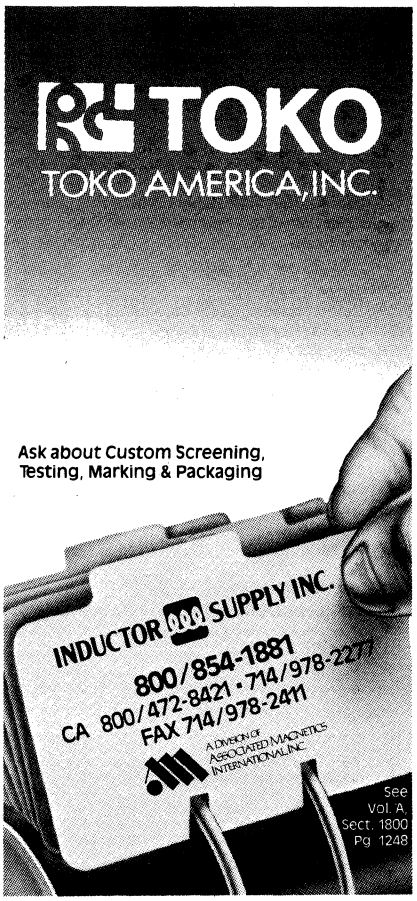
TORQ CORP., 32 W. Monroe St., Bedford, OH 44146, Tel: 216-232-4100, FAX: 216-232-4104; Empl.: 50; *Sls. Mgr.:* Lee Seabeck

TORWICO
ELECTRONICS INC

FAX: 201-363-6234

TORWICO ELCTRNS. INC., 410 Oberlin Ave. South, Lakewood, NJ 08701, Tel: 201-364-1800, TWX: 710-723-8343; Empl.: 200 ..... **A•2498-2499**

Local Sales Offices & Reps
CA Burlingame, Long and Assocs. 415-342-6544
CA El Cajon, KCE Corp. 619-588-1198
FL Orlando, Gra-Mar 305-658-1971
IN Noblesville, Patco & Assocs. 317-877-5986
IA Blue Grass, Ensco Rep 319-381-1466
IA Marion, Ensco Rep 319-377-8551
KS Countryside, Ensco rep 913-384-0840
KS Wichita, Ensco Rep 316-683-1070
MD Riderwood, W. S. Warrington & Assoc. 301-823-8759
MA Hingham, N.E. Reps. 617-749-8700
MO Maryland Heights, Ensco Rep 314-423-3935
NJ Marlton, BGR Assocs. 609-983-1020
NY Albany, Lynn Assocs. 518-459-1239
NY Buffalo, Lynn Assocs. 716-631-0054
NY Great Neck, Trionic 516-466-2300
OH Akron, Eljay Assoc. 216-666-3774
OR Portland, Abacus Sls. 503-777-8111
PA Pittsburgh, Lynn Assocs. 412-935-1466
TX Irving, Kite Elctrns. Sls. Co. 214-986-0321



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TOTAL POWER INTERNATIONAL, INC., 418 Bridge St, Lowell, MA 01850, Tel: 508-453-7272, TELEX: 948617; Empl.: 15 ..... **D•2115-2117**

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AZ	Tempe, Thor Engrg.	602-438-8494
CA	Goleta, Thorson Co. of S. Cal.	805-964-8751
CA	La Jolla, Thorson Co. of S. Cal.	619-292-8525
CA	Signal Hill, Thorson Co. of S.Cal.	213-595-0361
CO	Denver, W.E.S.T.	303-477-8180
FL	Ft.Lauderdale, Rainbow Sls.	305-733-9876
GA	Lilburn, The Phillip-Matthew Corp.	404-381-1662
IL	Schaumburg, Delta Tech. Sls.	312-310-0280
IN	Indianapolis, Mohrfield Mktg.	317-546-6969
IA	Cedar Rapids, Complete Sls.	315-393-7610
MA	Framingham, JDS Reps.	508-872-5876
MI	Brighton, A.P. Assocs.	313-229-6550
MN	Oakdale, Complete Sls.	612-731-2923
NJ	Mountain Lakes, Compoments for Elctrns.	201-625-0900
NC	King, The Phillip- Matthew Corp.	919-983-9790
OH	Bedford, A.P. Assocs.	216-475-0485
PA	Gibsonia, Lynn Assocs.	412-443-3670
UT	Salt Lake City, W.E.S.T.	801-292-8787
WI	Brookfield, Delta Tech.	414-781-4775
Can	Weston, Ont., Willagen Elctrns.	416-748-3538

Local Distributors

FL	Orlando, GMI Dists.	305-658-1082
GA	Norcross, Applied Power Inc.	404-263-0421
MI	Brighton, Applied Power Inc.	312-227-3604

TOWER ELECTRONICS, INC., 281 S. Commerce Circle, Fridley, MN 55432, Tel: 612-571-3737, FAX: 612-571-5605; *Sls. Mgr.:* Blase Des Marais

TOYOCOM USA INC., 617 E. Golf Rd., Ste. 112, Arlington Heights, IL 60005, Tel: 312-593-8780, FAX: 312-593-5678; Empl.: 10; *Sls. Mgr.:* Seiichi Omoto ..... **A•1491**

TOYO SPECTRUM CORP., 2934 Corvin Drive, Santa Clara, CA 95051, Tel: 408-720-8877, TELEX: 297584 TEAM UR, FAX: 408-720-9643; *Sls. Mgr.:* Bo Bjarno

TRACEWELL ENCLOSURES, INC., 567 Enterprise Dr., Columbus, OH 43081, Tel: 614-846-6175, 800-848-4525, FAX: 614-846-4450; Empl.: 30; *Sls. Mgr.:* Walter G. Waldron ..... **C•1110-1112**

Local Sales Offices & Reps

AZ	Phoenix, Hannah-Hill	602-431-1771
CA	Garden Grove, Advanced Digital Grp.	714-897-0319
CA	Mountain View, Thorson West	415-964-9300
CO	Broomfield, Hannah-Hill	303-460-0602
CT	Hartford, OEM Mktg. & Sls.	203-241-1612
ID	Idaho Falls, Hannah-Hill	208-529-0671
IL	Chicago, Computer & Sys. Sls.	312-830-7711
MA	Franklin, OEM Mktg. & Sls.	508-528-4983
NH	Salem, OEM Mktg. & Sls.	603-893-0009
NM	Albuquerque, Hannah-Hill	505-292-4098
OH	Cleveland, Five Star Elctrns.	216-349-1611
TX	Irving, Space Elctrns.	214-251-3636
UT	Salt Lake City, Hannah-Hill	801-364-0606
WI	Waukesha, Computer & Sys. Sls.	414-544-1411

TRA-CON, INC., 55 North St, Medford, MA 02155, Tel: 617-391-5550; Empl.: 55; *Sls. Mgr.:* Dan Romanow

TRACOR FLIGHT SYSTEMS, INC., Tracor, Inc., A Westmark Co., 1241 E. Dyer Rd., Santa Ana, CA 92705, Tel: 714-662-0333, TWX: 510-601-1467 FSI HDQT; FSC No.: 6B468; Empl.: 550; *Sls. Mgr.:* A. Mallamo/J. Stempson

TRACOR INSTRUMENTS, 6500 Tracor La., Bldg. 27, Austin, TX 78725-2100, Tel: 512-929-2051, TWX: 910-874-1366, FAX: 512-929-2747; Empl.: 10,800; *Sls. Mgr.:* William R. Murphy; *Dist. Mgr.:* Will Hoover

TRACOR PAKTRONICS, Westronics, Inc., 2441 Northeast Pkwy., Ft. Worth, TX 76106, Tel: 817-625-2311, 800-433-2880, TELEX: 629 00631, FAX: 817-625-1068; Empl.: 30; *Sls. Mgr.:* W. C. Preston

FAX: 813-886-2794

TRAK MICROWAVE CORP., 4726 Eisenhower Blvd., Dept. E-9, Tampa, FL 33634, Tel: 813-884-1411, TELEX: 52-827, TWX: 810-876-9140; FSC No.: 12855; *Sls. Mgr.:* Toby Gant ..... **A•1855-1859**

Local Sales Offices & Reps

AZ	Mesa, Fetty/Schoenduve	602-241-9009
CA	El Segundo, Fetty/Schoenduve	213-322-4991
CA	Mountain View, Disman Bakner	415-969-3010
CA	San Diego, Fetty/Schoenduve	619-292-5136
CO	Parker, Howard Assocs.	303-841-5755
FL	Melbourne, Jerry Williams, Inc.	407-259-7700
GA	Lawrenceville, M. Lader Co.	404-985-8057
IN	Ft. Wayne, TX Sls. Indiana	219-489-4447
IA	Cedar Rapids, J.R. Sls. Engrg.	319-393-2232
MD	Columbia, M. Lader Co.	301-381-1550
MD	Conowingo, M. Lader Co.	301-378-3449
MA	Andover, Bee Assoc.	508-475-2124
MO	Maryland Heights, Ensco-Rep Inc.	314-423-3935
NY	Liverpool, R&D Assocs.	315-457-0100
NY	New Rochelle, Ascor Elctrns.	914-235-8838
NC	Greensboro, M. Lader Co.	919-674-8970
PA	Lafayette Hill, M. Lader Co.	215-825-3177
TX	Austin, Thorson Co.	512-345-1985
TX	Dallas, Thorson Co.	214-233-5744
TX	Houston, Thorson Co.	713-558-8205
WA	Seattle, Datacom Assocs.	206-285-2525
Can	Nepean, Ont., Norgay Entprs.	613-723-1858
Can	Richmond, B.C., Norgay Entprs.	604-275-1121
Can	Toronto, Ont., Norgay Entprs.	416-259-9663
Can	Westmount, Que., Norgay Entprs.	514-932-3233

Local Distributors

CA	Mtn. View, Comstock Distrs., Inc.	415-969-3010
IL	Des Plaines, Compucon Distr., Inc.	312-827-9444
MA	Reading, Compucon Distr., Inc.	617-944-6875
NY	Ronkonkoma, Compucon Distr., Inc.	516-499-1211
PA	Conshohocken, MLC Distrs., Ltd.	215-825-3177

TRAK MICROWAVE LTD., TRAK Microwave Corp., 3/4 Lindsay Court, Dundee Technlg. Pk, Dundee, Scotland DD2 1TY, Tel: 44-382-561509, TELEX: 76266, FAX: 44-382-562643; Empl.: 30

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TRAK SYSTEMS, Div. TRAK Microwave Corp., 4722 Eisenhower Blvd., Dept. E-9, Tampa, FL 33634-6391, Tel: 813-884-1411, TELEX: 52-827, TWX: 810-876-9140; FSC No.: 11165; *Sls. Mgr.:* Thomas L. Roberts ..... **D•1197-1201**

Local Sales Offices & Reps

AL	Huntsville, Magaro & Assocs.	205-882-0827
AZ	Phoenix, J. Smith Assocs.	602-267-0981
CA	Mtn. View, Tech Mktg. Assocs. Inc.	415-968-0102
CA	San Diego, L. L. Stoakes, Inc.	619-452-1600
CO	Parker, Howard Assocs.	303-841-5755
FL	Sarasota, Bass Assocs.	813-922-9538
GA	Atlanta, Magaro & Assocs.	404-451-8862
IN	Ft. Wayne, TX Sls. Indiana	219-489-4447
MD	Annapolis, Blackwood Assocs.	301-268-3669
MA	Wayland, High-Tech Sls., Inc.	617-653-3838
NM	Albuquerque, J. Smith Assocs.	505-345-6501
NC	Raleigh, M. Lader Co.	919-848-3253
PA	Philadelphia, Rabal Assocs.	215-922-6914
TX	Arlington, J. T. Houston Assocs.	817-265-2931
WA	Bellevue, Tasco, Inc.	206-453-1414
Can	Nepean, Ont., Norgay Entprs.	613-723-1858
Can	Richmond, B.C., Norgay Entprs.	604-275-1121
Can	Toronto, Ont., Norgay Entprs.	416-234-8966
Can	Westmount, Que., Norgay Entrps.	514-932-3233

TRANCOR, 108 N. High St, P.O. Box 907, San Saba, TX 76877, Tel: 915-372-6127; Empl.: 6; *Sls. Mgr.:* William F. Mayfield

TRANSAMERICA DELAVAL, INC., See IMO Delaval, Inc., CEC Instruments Div.

TRANSAMERICA DELAVAL, See IMO Delaval, Inc., Gems Sensors Div.

Trans American Transformer, Inc.

FAX: 516-928-0852

TRANS AMERICAN TRANSFORMER, 26 Hulse Rd., E. Setauket, NY 11733, Tel: 516-928-0762; FSC No.: 61619; Empl.: 30 ..... **A•2489**

TRANSCO PRODUCTS, INC., 1001 Flynn Rd., Camarillo, CA 93011-6003, Tel: 805-987-8007, TELEX: 857579, FAX: 805-484-0830; FSC No.: 82152; Empl.: 325; *Sls. Mgr.:* Jerry Fricke, Dir. of Mktg.

TRANSDUCERS & SYSTEMS

FAX: 203-481-8937

TRANSDUCERS & SYSTEMS, A Prime Technology Company, Twin Lakes Rd., P.O. Box 185, N. Branford, CT 06471, Tel: 203-481-5721, TWX: 710-452-3092; Empl.: 60; *Sls. Mgr.:* J. L. Jamieson ..... **B•1996**

Local Sales Offices & Reps

CA	Huntington Beach, Transducer Sys.	714-969-7690
CA	Santa Clara, Tech-Ser, Inc.	408-496-1004
IL	Des Plaines, Marsland Assocs.	312-298-2620
IN	Indianapolis, Marsland Assocs., Inc.	317-293-5437
IA	Marion, Marsland Assocs.	319-373-0566
MD	Joppa, Electra-Tech	301-877-0344
MN	Minneapolis, Marsland Assocs.	612-545-4481
MO	St. Louis, Marsland Assocs.	314-991-1399
NJ	Hillsdale, CB Assocs., Inc.	201-644-6230
NY	Rochester, TAE-REP	716-586-8710
NY	Schenectady, TAE-REP, Inc.	607-692-3705
NY	Whitney Point, TAE-REP, Inc.	607-692-3705
OH	Dayton, RIXAN Assocs.	513-278-4216
OH	Stow, Rixan Assocs., Inc.	216-686-2909
PA	Bensalem, Electra-Tech	215-245-7455
TX	Houston, Electric Control Assocs.	713-771-5944
TX	Lewisville, Electric Control Assocs.	214-221-3143
VA	Dumfries, Electra-Tech	703-670-6962
WI	New Berlin, Marsland Assocs., Inc.	414-786-6611

TRANSDUCER SYSTEMS, INC., 1510 Delp Dr., Kulpsville, PA 19443, Tel: 215-256-4611, FAX: 215-256-4214; Empl.: 310

TRANSDUKTOR, INC., See Ulveco, Inc.

TRANSENE, Rte. 1, Rowley, MA 01969, Tel: 508-948-2501, FAX: 508-948-2206; Empl.: 21; *Sls. Mgr.:* H. Femino

TRANSFORMER DESIGN, INC., 7901 W. Clinton, Milwaukee, WI 53223, Tel: 414-358-5300; *Sls. Mgr.:* Fred A. Lewis

TRANSFORMER TECHNOLOGIES, INC., 52 Putnam St., Mt. Vernon, NY 10550, Tel: 914-668-1600, FAX: 914-668-4794; Empl.: 10; *Sls. Mgr.:* Thomas Quaglieri ..... **A•2501**

TRANSICOIL, INC., Trooper Rd., P.O. Box 99, Worcester, PA 19490-9990, Tel: 215-277-1300, TWX: 510-660-0132; FSC No.: 82686; Empl.: 290; *Sls. Mgr.:* P. Schoenacker

TRANSICOIL INC., Penn Airborne Products, 950 Industrial Hwy., Southampton, PA 18966, Tel: 215-355-3400, TELEX: 834-759, FAX: 215-322-2194; FSC No.: 25805; Empl.: 41; *Sls. Mgr.:* Claude Mercier

TRANSISTOR DEVICES, INC., 274 S. Salem St., Randolph, NJ 07869, Tel: 201-361-6622; FSC No.: 09004; Empl.: 600; *Sls. Mgr.:* J. A. Gilson ..... **D•1358-1362, 2164-2165**

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AL	Huntsville, Hughes Assocs., Inc.	205-533-9108
AZ	Scotsdale, Dave Menegay & Assocs.	602-994-9519
AR	El Dorado, Kemp Engrg. Co. Inc.	501-862-5869
CA	Bakersfield, FLW, Inc.	805-398-0720
CA	Campbell, SMA	408-370-6900
CA	Canoga Pk., FLW, Inc.	805-984-0167
CA	Carlsbad, FLW, Inc.	619-434-5251
CA	Costa Mesa, FLW Inc.	714-751-7512
CO	Denver, Elcom, Inc.	303-337-2300

CT Cheshire, MECO 203-271-0026
GA Norcross, Hughes Assocs., Inc. 404-622-1587
GA Warner Robins, Hughes Assocs., Inc. 912-477-1889
IL Wheeling, Ed Joyner & Co. 312-520-1200
IN Carmel, Fred Dorsey & Assoc., Inc. 317-844-4842
IA Des Moines, The Beams Co. 515-255-1148
KS Shawnee Mission, The Beams Co. 913-631-0300
MA Lexington, E. F. Delfino, Inc. 617-862-1118
MA Lowell, Klaasing Elctrns. 508-453-7272
MA Reading, MECO 617-944-6660
MI Ann Arbor, Ashby Assocs., Inc. 313-995-4082
MN Bloomington, IP Sls. Co. 612-881-0549
MS Corinth, Hughes Assocs., Inc. 601-287-2915
MO St. Louis, The Beams Co. 314-434-8448
NJ Englewood Cliffs, Power Conversion & Control (PC2) 201-569-0015
NJ Franklin Lakes, Power Conversion & Control (PC2) 201-848-8900
NM Albuquerque, Brytech Sls., Inc. 505-884-1123
NY Roburn Agencies, Inc. 914-968-1016
NY Clinton, Advanced Comps. Corp. 315-853-6438
NY Endicott, Advanced Comps. Corp. 607-785-3191
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NY North Syracuse, Advance Components 315-699-2671
NY Northport, Data Logic Sls. 516-754-3333
NY Port Jefferson Station, Power Conversion & Control (PC2) 516-474-5696
NY Rochester, Advanced Comps. Corp. ... 716-544-7017
NY Scottsville, Advanced Comps. Corp. ... 716-889-1429
NC Cary, Hughes Assocs., Inc. 919-467-7029
OH Arcanum, Ashby Assocs., Inc. 513-461-2668, 513-692-8713
OH Lyndhurst, Ashby Assocs., Inc. 216-461-0826
OK Tulsa, Kemp Engrg. Co., Inc. 918-663-4501
OR Portland, Topp Engrg. Sls. Corp. 503-244-7265
PA Pittsburgh, Ashby Assocs. 412-343-5105
PA Southampton, Campbell Assoc. 215-322-6630
TN Jonesboro, Hughes Assocs. 615-753-2719
TN Nashville, Hughes Assocs. 615-871-0908
TX Lewisville, Jim Hughes Co. 214-221-1536, 214-221-1538
VA Alexandria, Dyna-Rep Co. 703-354-1222
WA Bellevue, Topp Engrg. Sls. Corp. 206-747-5400
WA Greenacres, Topp Engrg. Sls. Corp. ... 509-928-4177

TRANSKINETIC SYS., 110 Shawmut Rd., Canton, MA 02021, Tel: 617-828-3000; Empl.: 17; *Sls. Mgr.:* D. Pettijohn

TRANSMAGNETICS, 210 Adams Blvd, Farmingdale, NY 11735, Tel: 516-293-3100, TWX: 510-224-6420, FAX: 516-293-3793; FSC No.: 17755; Empl.: 44; *Sls. Mgr.:* Fred Haber ..... **D•1202-1205**

Local Sales Offices & Reps
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MI Wyoming, Lowell Wendt Mktg. 616-531-4499
PA Doylestown, T I S (Tech. Instr. Sls.) ... 215-345-4110
TX Carrollton, Seaton Corp. 214-380-0414
WA Bellevue, Scientific Dvcs. NW 206-747-5169

TRANSMET CORP., 4290 Perimeter Dr., Columbus, OH 43228, Tel: 614-276-5522, 800-245-5253, TWX: 810-493-2368, FAX: 614-276-FAXX; *Sls. Mgr.:* Ronald A. Crossman; *Dist. Mgr.:* Amy L. Holbrook

TRANS METRICS, INC., 5325 Naiman Pkwy Ste.E , Solon, OH 44139, Tel: 216-248-2229, TWX: 620 332 14, FAX: 216-248-7780; FSC No.: 6625; Empl.: 20; *Sls. Mgr.:* James N. Dietrich

TRANSTECTOR SYSTEMS, INC., P.O. Box 300, Hayden Lake, ID 83835, Tel: 800-635-2537, TELEX: 150-077TRANSTECPFLS, FAX: 208-772-9016; FSC No.: 30992; Empl.: 150; *Sls. Mgr.:* Bruce Braskich; *Dist. Mgr.:* Shawn Thompson

TRANS-TEK, P.O. Box 338, Rte. 83, Ellington, CT 06029, Tel: 203-872-8351, TELEX: 99207, FAX: 203-872-4211; FSC No.: 27109; Empl.: 40; *Sls. Mgr.:* William R. Padin

TRAN-TEC CORP., Box 1044, Columbus, NE 68601, Tel: 402-564-2748, FAX: 402-564-4946; Empl.: 46; *Sls. Mgr.:* Cliff Schroeder

Local Sales Offices & Reps
CA Redwood City, Woodworth Co. 415-365-0252
CA Tustin, Sierra-Pacific Engrg. Co. 714-731-3411
CO Lafayette, Pierce-Robbins Assocs. 303-665-3296
FL Palm Bch. Gardens, Russell Assocs. .. 305-627-1503
GA Atlanta, Russell Assocs. 404-255-8422
IN Ft. Wayne, Scott Elctrns, Inc. 219-489-5690
IA Hiawatha, Ard Sls. Co. 319-393-6392
MD Bel Air, Russell Assocs. 301-879-9180
MA Wakefield, H.C. Jappe Co. 617-245-9359
PA Westchester, Russell Assocs. 215-696-0700
NY Bay Shore, Russell Assocs. 516-666-6500
NY Morrisville, Naylor Elec. Co. 315-684-9620
OH Cleveland, D. Steffen & Assocs. 216-461-8333
TX Dallas, Russell Assocs. 214-699-0383
WA Bellevue, Russell Assocs. 206-455-3694

TREND CIRCUITS, 44358 Old Warm Springs Blvd, Fremont, CA 94536, Tel: 415-651-1150; Empl.: 35; *Sls. Mgr.:* Mike Gunion

TRENT, INC., 201 Leverington Ave., Philadelphia, PA 19127, Tel: 215-482-5000, FAX: 215-482-9389; Empl.: 55

TRIAC ELECTRONIC SYSTEMS, INC., 87-27 Myrtle Ave., Glendale, NY 11385, Tel: 718-441-4759, TWX: 221500 ASAS ATT TRIAC; Empl.: 35; *Sls. Mgr.:* Victor Botnick

TRIAD POWER SYSTEMS, See Fiskars Electronics Corporation

THE TRIANGLE TOOL GROUP, INC., Cameron Rd., P.O. Box 1807, Orangeburg, SC 29115, Tel: 803-534-7010, TELEX: 57-3498; FSC No.: 30106; *Sls. Mgr.:* Herbert L. Tait

TRICON INDUSTRIES, INC., Brazing Alloys & Chemical Products Div., 5000 Chase St., Downers Grove, IL 60515-4012, Tel: 312-963-0220, FAX: 312-963-0269; Empl.: 15; *Sls. Mgr.:* T. R. Boedeker

TRICON INDUSTRIES, INC., Electromechanical Division, 2325 Wisconsin Avenue, Downers Grove, IL 60515-4076, Tel: 312-964-2330, FAX: 312-964-5179; Empl.: 260; *Sls. Mgr.:* Robert Stevens

TRIDAK, 1120 Federal Rd., Brookfield, CT 06804, Tel: 203-775-1287, TELEX: 62009593, FAX: 203-775-4376; Empl.: 20; *Sls. Mgr.:* F. C. Herot

TRI-DATA SYSTEMS, INC., 1450 Kifer Road, Sunnyvale, CA 94086-5306, Tel: 408-746-2900, TELEX: 172282, FAX: 408-746-2074; Empl.: 90

TRIDYNE PROCESS SYSTEMS, DBI Industries, 80 Allen Rd., So. Burlington, VT 05401, Tel: 802-863-6873, FAX: 802-860-1591; Empl.: 35; *Sls. Mgr.:* Jean Garin

TRIGON/ADCOTECH, Dynatech, 100 S. Milpitas Blvd., Milpitas, CA 95035, Tel: 408-946-4300, FAX: 408-263-9217; Empl.: 100; *Sls. Mgr.:* Gary Dotzler

TRILOBYTE COMPUTER CORPORATION, 14477 Catalina St., San Leandro, CA 94577, Tel: 415-895-1100, TWX: 910-350-0171, FAX: 415-895-2244; Empl.: 15

TRI-MAG, Inc.

FAX: 209-651-0188

TRI-MAG, INC., 8210 West Doe Ave., Visalia, CA 93291, Tel: 209-651-2222, TELEX: (ITT) 4994462; FSC No.: 64771; Empl.: 80 ..... **A•1678-1680; D•2118-2119**

Local Sales Offices & Reps
AL Huntsville, EPI, Inc. 205-534-3747
CA Laguna Hills, Electro-Venture 714-581-9244
CA Santa Clara, C. B. King & Assocs. 408-988-7551
FL Plantation, EMS, Inc. 305-587-7146
IL Arlington Hgts., Coombs Assocs., Inc. 312-439-9810
KS Overland Pk., EPI, Inc. 913-642-9118
MD Lisbon, W.R. Hartmaier Assoc., Inc. 215-643-6691
MS Jackson, EPI, Inc. 601-856-6251
MO St. Louis, EPI, Inc. 314-962-1411
NH Nashua, Bell Controls 603-882-6984
OH Beachwood, Elctrn. Sismasters 216-831-9555
OK Tulsa, Cunningham Comps. 918-665-3562
OR Beaverton, W. J. Purdy Co. 503-641-9373
PA Monroeville, W.R. Hartmaier Assoc. Inc. 215-643-6691
PA Willow Grove, W.R. Hartmaier Assocs., Inc. 215-643-6691
TX Austin, Cunningham Comps. 512-258-1744
TX Dallas, Cunningham Comps. 612-454-3086
TX Houston, Cunningham Comps. 713-461-4197
WI Milwaukee, Coombs Assocs., Inc. 414-351-6123

TRIMM, INC., Div. of Newton Instr. Co., 400 W. Lake St., Box 489, Libertyville, IL 60048, Tel: 312-362-3700, TELEX: 728452, FAX: 312-680-3888; Empl.: 50; *Sls. Mgr.:* Nancy Calkins

TRIM-TRONICS, INC., Rte. 20 East, Cazenovia, NY 13035, Tel: 315-655-9528, FAX: 315-655-2149; Empl.: 20; *Sls. Mgr.:* James E. Dowd

TRINETICS INC., 55807 Currant Rd., Mishawaka, IN 46545-4899, Tel: 219-259-8535, FAX: 219-259-8552; FSC No.: 3677; Empl.: 100; *Sls. Mgr.:* P. L. Kamerer

TRIO LABORATORIES, INC., 80 Dupont St., Plainview, NY 11803, Tel: 516-349-0400, TWX: 510-221-1861; FSC No.: 00638; Empl.: 60; *Sls. Mgr.:* Richard Frerking, Dir. of Sls. & Mktg.

TRIONICS, INC., P.O. Box 225, St. Charles, IL 60174, Tel: 312-232-9117, FAX: 312-232-0820; Empl.: 50

TRIO-TECH INTERNATIONAL, 355 Parkside Dr., San Fernando, CA 91340, Tel: 818-365-9200, TELEX: 194811(TTI INTL SFDO), FAX: 818-365-8210; Empl.: 266; *Sls. Mgr.:* Ron Nelson

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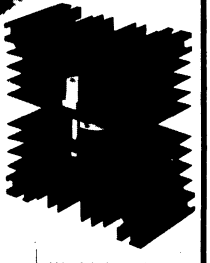

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Local Sales Offices & Reps

AZ	Phoenix, Shefler-Kahn	602-257-9015
CA	Burlingame, Polach & Bensinger	415-697-2525
FL	Deerfield Beach, Jack Krutek & Assocs.	305-427-4202
FL	Maitland, Jack Krutek & Assocs.	305-628-4837
GA	Atlanta, Millar Elctrns.	404-261-6160
KS	Olathe, SPS Assocs., Ltd.	913-764-4460
MI	Grosse Point Woods, A & D Elctrn. Sls.	313-884-1956
NJ	Englewood Cliffs, Masin Esco	201-569-8868
NY	Hauppauge, Masin Esco	516-273-3500
NY	Mendon, Marchese Marsey Barden	716-582-2240
NC	Raleigh, Millar Elctrns.	919-828-8840
RI	Lincoln, Adams-McGregor	401-726-1300
RI	West Warwick, Adams McGregor, Inc.	401-821-1320
TX	Dallas, Elcom Mktg. Inc.	214-241-2166

Local Distributors

AL	Birmingham, Brownell-Electro	205-323-4761
AL	Mobile, Brownell-Electro	205-479-8581
AZ	Phoenix, Metermaster Div.	602-437-1425
CA	Glendale, Western Elctrn. Supp.	213-245-1226
CA	Irvine, Meter Craft/Larson	714-261-7135
CA	Los Angeles, Metermaster Div.	213-685-4340
CA	Palo Alto, Metermaster	415-960-8500
CA	San Diego, Metermaster Div.	619-560-4841
CA	Santa Clara, Dynametron	408-727-6531
CO	Denver, Meter-master	303-722-5766
FL	Hialeah, Kimball Elctrn. Lab.	305-822-5792
FL	Miami, Brownell-Electro	305-884-3072
FL	Orlando, Brownell-Electro	305-843-6770
GA	Atlanta, Brownell-Electro	404-762-5181
GA	Atlanta, Process Meas. Control	404-696-7481
IL	Countryside, Pacific Indicator	312-352-3500
IL	Elk Grove Village, Meter-Makers	312-439-5050
IN	Evansville, Electro-Lab Svcs.	812-423-5211
IN	Indianapolis, E.I.L. Instrs.	317-545-1373
KS	Overland Park, Brooks Elec.	913-648-3131
LA	New Orleans, Indl. Instr. Works	504-733-8355
MD	Gaithersburg, Pioneer/Inst.	301-948-2242
MD	Savage, Pyttronic	301-792-0780
MA	Waltham, Calibron	617-894-6440
MI	Ferndale, Ram Meter	313-398-6767
MN	Minneapolis, Instr. Control	612-871-2514
MO	St. Louis, ISL Corp.	314-535-5760
NJ	Belleville, Marshall Inst.	201-751-1190
NJ	New Foundland, Hosica Labs	201-697-6111
NY	Clarence, Trott Elctrns.	716-634-8500
NY	L.I.C., Metermod Instr.	718-726-4850
NC	Charlotte, Brownell-Electro	704-597-1270
NC	Raleigh, Brownell-Electro, Inc.	919-876-6524
NC	Raleigh, Meter-Meterics, Div. of I.T.R.	919-872-5456
NC	Raleigh, Speed Instr. Div. Owen-Barbot	919-876-4919
OH	Cleveland, Pioneer/Instrmn.	216-587-3600
OH	Cleveland, Weschler Elec.	216-238-2550
OH	Dayton, Pioneer/Dayton	513-236-9900
OK	Tulsa, Tri-State Instr.	918-836-0286
PA	Philadelphia, Sunshine Sci.	215-673-5600
PA	Pittsburgh, CAM/RPC	412-963-1885
TN	Knoxville, Brownell-Electro	615-966-3441
TN	Memphis, Brownell-Electro	901-795-8487
TN	Memphis, Instrument Repair Svc.	901-278-0762
TN	Nashville, Brownell-Electro	615-889-8230
TX	Beaumont, Straughn Elec.	409-838-4563
TX	Dallas, Ultra Instr.	214-357-0297

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TX	Houston, Meters & Instrs.	713-644-1631
TX	Houston, Quality Instr.	713-524-0528
TX	Odessa, Whitlock Instr.	915-337-3412
VA	Richmond, Meter Metrics (I.T.R.)	804-275-1431
WA	Seattle, Eicher-Richards	206-523-7888
WI	Milwaukee, E-M Instrs.	414-272-7799

TRIPP-LITE, 500 No. Orleans, Chicago, IL 60610, Tel: 312-329-1777, FAX: 312-644-6505; Empl: 80; *Sls. Mgr.:* Priscilla Galgan; *Dist. Mgr.:* Priscilla Galgan

TRIRIDGE CORPORATION, 1116 W. Main St., Leesburg, FL 32748, Tel: 904-728-0799

FAX: 603-627-6025

TRM, INC., 401 Kelly Ave., Grenier Field, Manchester, NH 03103, Tel: 603-627-6000; Empl.: 40; *Sls. Mgr.:* A. Butts ..... **A•1861-1864**

Local Sales Offices & Reps

CA	Palo Alto, RF Assoc.	415-494-3331
CA	Santa Ana, Youngewirth & Olenick	714-852-0788
MD	Laurel, Mid-Atlantic Sls.	301-725-3955
MA	Chelmsford, Matrix Sls.	508-459-4000
NJ	Keansburg, Reps Five	201-495-3625
TX	Dallas, McDonald Assoc.	214-239-3293
VA	Sterling, Beacon North	703-478-2480

TROMPTER ELECTRONICS, INC., Sterling Holding, 31186 La Baya Dr., P.O. Box 5069, Westlake Village, CA 91359-5069, Tel: 818-707-2020, TWX: 910-494-1210, FAX: 818-706-1040; FSC No.: 14949; Empl.: 180; *Sls. Mgr.:* Dick Coleman; *Dist. Mgr.:* Hap Gladish ..... **C•1554**

Local Sales Offices & Reps

AL	Huntsville, Currie, Peak and Frazier	205-536-1506
AZ	Phoenix, Aztec Entprs.	602-944-9185
CA	Colton, Knight Co.	619-452-7196
CA	Los Angeles, Knight Co.	213-670-2833
CA	Santa Clara, ISG	408-980-1166
CO	Denver, Aztec Entprs.	303-779-5285
CT	Fairfield, L & M Assocs.	203-334-5005
CT	Waterbury, Underwood Sls.	203-756-7566
CT	Wethersfield, Underwood Sls.	203-563-3046
FL	Melbourne, Currie, Peak & Frazier	407-724-6795
FL	Orlando, Currie, Peak & Frazier	407-855-0843
FL	Pace, Currie, Peak & Frazier	904-994-0599
FL	Tampa, Currie,Peak, & Frazier	813-963-1076
GA	Duluth, Currie, Peak & Frazier	404-497-9404
IL	Arlington Heights, Berndt Assocs.	312-632-0900
IN	Carmel, Berndt Assocs.	317-844-0114
KS	Wichita, Baka	316-682-8411
MD	Lanham, Sel-Tronics	301-731-8080
MA	Lowell, Underwood Sls.	617-256-8191
MI	Sterling Hgts., Geotronix	313-254-0520
MN	Edina, Engineering Prods. Assoc.	612-835-9002
MO	St. Johns, Baka	314-429-2252
NJ	Elmwood Park, L & M Assoc. Eng. Rep.	201-797-0441
NM	Albuquerque, Aztec Entprs.	505-262-1688
NY	Clifton, T.A.E. Reps.	518-371-3117
NY	Getzville, T.A.E. Reps.	716-688-5008
NY	New York, L & M Assocs. Eng. Rep.	212-243-6155
NY	Rochester, T A E Reps.	716-586-8710
NY	Whitney Point, T.A.E. Reps.	607-692-3705
NC	Charlotte, Currie, Peak & Frazier	704-846-1702
NC	Greensboro, Currie, Peak & Frazier	919-273-6308
OH	Richfield, Geotronix	216-659-6100
OH	Trotwood, Geotronix	513-854-5939
OR	Beaverton, Evergreen Mktg. Co.	503-643-8020
PA	Allison Park, Geotronix	412-487-1331
PA	Andalusia, L & M Assocs.	215-245-6658
TN	Smyrna, Currie, Peak & Frazier	615-459-0743
TX	Argyle, Milestek	817-455-7444
UT	Ogden, Aztec Entprs.	801-621-1655
WA	Bothell, Evergreen Mktg.	206-485-8063
WI	Milwaukee, Berndt Assocs.	414-545-8400
Can	Markham, Ont., Components, Ltd.	416-479-7200
Can	St. Laurent, Que., Componetics, Ltd.	514-331-9930
Can	St. Laurent, Que., Promark Elctrns.	514-733-5344

Local Distributors

CA	Los Angeles, Knight Co.	213-670-2833
CA	Santa Clara, ISG Sls.	408-980-1166
MD	Lanham, Sel-Tronics	301-731-8080
MA	Lowell, Underwood Sls.	508-256-8191
MN	Minneapolis, Bortech Sls.	612-835-9002
NJ	Elmwood Pk, L & M Assocs.	201-797-0441
TX	Argyle, Milestek	817-455-7444

TRONTECH, INC., 63 Shark River Rd., Neptune, NJ 07753, Tel: 201-922-8585, TELEX: 132445, FAX: 201-922-3903; Empl.: 40

TRULINE CORPORATION, P.O. Box 1469, Visalia, CA 93279-1469, Tel: 209-747-1261, FAX: 209-747-0280; Empl.: 85; *Sls. Mgr.:* R. W. Aubery

TRW LSI PRODUCTS INC., PO Box 2472, La Jolla, CA 92038, Tel: 619-457-1000, TELEX: 697957, TWX: 910-335-1571, FAX: 619-455-6314; FSC No.: 59621; Empl.: 290; *Sls. Mgr.:* Al Jonas, Dir. Sls.; *Dist. Mgr.:* Ron Courtois

TRW MICROWAVE, See FEI Microwave

TRW RESISTIVE PRODUCTS DIV., See International Resistive Co.

TRW TECHNAR, INC., TRW, Inc., 5462 Irwindale Ave., Irwindale, CA 91706, Tel: 818-334-0250, FAX: 818-969-4781; Empl.: 500; *Sls. Mgr.:* George R. Downs

TS PRODUCTS, INC., 12455 Branford St., Bldg. 22, Arleta, CA 91331, Tel: 818-896-6676; Empl.: 8; *Sls. Mgr.:* Gene Samuel; *Dist. Mgr.:* Gene Samuel ..... **D•2248**

Local Sales Offices & Reps

CA	Corona Del Mar, Motion Control, Inc.	714-675-0211
CA	Los Angeles, TS Products, Inc.	818-896-6676
CA	Montebello, TUCUL Engrg.	213-728-7397

TTE

FAX: 213-312-1055

TTE, INCORPORATED, 11652 W. Olympic Blvd., Los Angeles, CA 90064, Tel: 213-478-8224; FSC No.: 07766; Empl.: 30; *Sls. Mgr.:* S. J. Sodaro ..... **A•1726-1735**

Local Sales Offices & Reps

MA	Woburn, Cygnus Sls., Inc.	617-935-1395
MD	Laurel, CSDS, Inc.	301-953-7884

TTS-TELECOM TERMINAL SYSTEMS, Box 66369, Los Angeles, CA 90066, Tel: 213-390-9494, TELEX: 3715831; Empl.: 18; *Sls. Mgr.:* L. Winters

TUCKER ELECTRONICS, Box 461966, Garland, TX 75046, Tel: 214-348-8800, 800-527-4642, TELEX: 79-1726, TWX: 62812862, FAX: 214-348-0367; Empl.: 43; *Sls. Mgr.:* Don Stabeno

TUNGSTONE BATTERIES, INC., 18 Billings St., Sharon, MA 02067, Tel: 617-784-2000, FAX: 617-784-5563; Empl.: 23; *Sls. Mgr.:* William O'Connell

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FAX: 602-744-6155

TUSONIX, INC., 7741 N. Business Park Drive, P. O. Box 37144, Tucson, AZ 85740-7144, Tel: 602-744-0400, TELEX: 102-299640, TWX: 310-299640; FSC No.: 59660; Empl.: 800; *Sls. Mgr.:* Robert H. Jones; *Dist. Mgr.:* John H. Ohlrich ..... **A•1181, 1681**

Local Sales Offices & Reps

AZ	Tucson, Tusonix, Inc.	602-744-0400
CA	San Jose, Tusonix, Inc.	415-657-7110
CA	Santa Ana, Tusonix, Inc.	714-633-3257
IL	Aurora, Tusonix, Inc.	312-851-7180
NY	Ontario, Tusonix, Inc.	315-524-7147
NC	Greensboro, Tusonix, Inc.	919-292-4286
TX	Plano, Tusonix, Inc.	214-985-9335

Local Distributors

AZ	Tempe, Penstock, Inc.	800-255-6788
AZ	Tempe, TTI	602-431-1191

CA Chatsworth, TTI 818-709-1010
CA Milpitas, TTI 408-946-5577
CA San Diego, TTI 619-587-4888
CA Santa Ana, TTI 714-641-9393
CA Sunnyvale, Penstock, Inc. 408-730-0300
CO Denver, TTI 303-429-6806
CO Englewood, Penstock, Inc. 303-792-0777
CT Wallingford, TTI 203-284-7474
FL Orlando, TTI 407-859-1000
GA Norcross, TTI 404-662-0911
IL Chicago, Newark Elctrns. 312-638-4411
IL Des Plaines, Compucon Distrs. 800-345-0632
IL Palatine, Penstock, Inc. 312-934-3700
IN Indianapolis, Penstock, Inc. 317-784-3870
MD Baltimore, Compucon Distrs. 800-426-7746
MD Beltsville, Resco 301-937-9100
MD Columbia, TTI 301-995-1331
MD White Marsh, Resco 301-529-0500
MA Reading, Compucon Distrs. 617-944-6875
MA Wilmington, TTI 508-658-4700
MN Eden Prairie, TTI 612-944-5080
NJ Mt. Laurel, TTI 609-234-6400
NJ Teterboro, Penstock, Inc. 201-288-7313
NY Hauppauge, Fairmont Elctrn. Sls. 516-231-3313
NY Ronkonkoma, Compucon Distrs. 516-981-8810
NY Ronkonkoma, TTI 516-737-2000
NC Raleigh, Resco 919-781-5700
OH Columbus, TTI 614-848-5770
TX Fort Worth, TTI 817-595-3100
WA Bellevue, Penstock, Inc. 206-454-2371
WA Redmond, TTI 206-882-0291

TUSTIN ELECTRONICS CO., 1580 N. Kellogg Drive, Anaheim, CA 92807, Tel: 714-777-5800, FAX: 714-777-5814; FSC No.: 7025-0010; *Sls. Mgr.:* Saul Tunkelrott

TWP, INC., 2133 4th St, Berkeley, CA 94710, Tel: 415-548-4434, TELEX: 171-267, FAX: 415-548-3073; Empl.: 10; *Sls. Mgr.:* G. Reed

TYCO INSTR. DIV., See Data Instrs.

TYCOR INTERNATIONAL INC., 6107-6 Street S.E., Calgary, Alberta, Canada T2H 1L9, Tel: 403-259-3200, TELEX: 03 825842, FAX: 403-253-0663; *Sls. Mgr.:* Scott Lee, Canadian

TYTON CORP., Box 23055, 7930 N. Faulkner Rd, Milwaukee, WI 53223, Tel: 414-355-1130, TWX: 910-262-3094, FAX: 414-355-7341; *Sls. Mgr.:* Jim Campion, VP Sls.

UCCEL CORPORATION, P. O. Box 660054, Dallas, TX 75266, Tel: 214-353-7100, TWX: 910-861-4990; Empl.: 1350

UCE, INC., 35 Rockland Rd., Norwalk, CT 06854, Tel: 203-838-7509, FAX: 203-838-2566; Empl.: 20; *Sls. Mgr.:* D. Schmidt

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Local Sales Offices & Reps

AZ Tempe, Semper Fi Sls., Inc. 602-730-9553
CA Chatsworth, Raltech 818-700-0933
CA Del Mar, Chapman & Chapman 619-755-0412
CA Glendale, Mission Mktg. Grp. 818-247-9110
CA Santa Clara, I Squared Inc. 408-988-3400
CO Denver, West Inc. 303-477-8180
CT Bloomfield, F. S. I. 203-243-3122
FL St. Petersburg, J.C.J. Assocs. 813-343-2679
IL Downers Grove, Richmar Elctrn. 312-968-0118
IN Ft. Wayne, Denton Mktg. 219-486-0665
IA Hiawatha, Ard Sls. 319-393-6392
MA Lowell, F.S.I. 617-449-7920
MI Jackson, T.P.S. & Assocs. 517-783-1722
MN Minneapolis, Dunlop Consits. 612-933-9070
NJ Piscataway, R. P. Luce & Co. 201-752-8750
NY Chappaqua, Micrel, Inc. 914-238-4961
NY New Hyde Pk., R. P. Luce & Co. 516-437-4550
NY Rochester, Fritz Dasson 716-338-1699
OH Wooster, T.P.S. & Assocs. 216-264-0971
PA Wynnewood, Metz-Benham Assocs., Inc. 215-896-7300
TX Richardson, Pro Comp. Sls. Co. 214-669-1500
UT Salt Lake City, West, Inc. 801-292-8787
WA Bellevue, Olson Tech. Sls. Corp. 206-883-7792
WI Butler, Richmar Elctrn. 414-781-1730
Can Mississauga, Ont., Source Elctrn. 416-676-0830
Can Winnipeg, Manitoba, Smith-Paterson & Assoc. 204-885-1376

Local Distributors

CA Chatsworth, Petell/Passive Comp., Inc. 818-341-1745
CA San Diego, Neumann Elec. 619-695-3005
CA San Jose, Zeus Comps. 408-998-5121
CA Westlake Vl., Distel, Inc. 805-495-9998
CO Denver, IEC Integrated Elctrn. 303-843-2040
FL Oviedo, Zeus Comp. 305-365-3000
FL Tampa, Impala Elctrns. 813-885-4747
MD Columbia, Aztech Elctrns. 301-995-6800
MD Columbia, Zeus Comps. 301-997-1118
MA Burlington, TLC Elctrns. 617-273-0140
MA Lexington, Zeus Comps. 617-863-8800
NY Bohemia, Justin Elec. 516-589-4000
NY Hauppauge, Jaco, Inc. 516-273-5500
NY Melville, SAI, Inc. 516-293-2710
NY Port Chester, Zeus Comps. 914-937-7400
NY Valley Stream, L & S Elec. 516-561-2474
OH Cincinnati, Eclipse of Ohio 513-661-7733
OH Cincinnati, G & A Sls. 513-521-8800
OH Dayton, Televox, Inc. 513-454-1225
OR Beaverton, IEC Integraed Elctrn. 503-641-1690
TX Dallas, EPIC 214-503-1414
TX Richardson, Jaco, Inc. 214-235-9575
TX Richardson, Zeus Comps. 214-783-7010
WA Bellevue, IEC Integrated Elctrn. 206-455-2727

ULVAC NORTH AMERICA CORPORATION, P.O. Box 799, 105 York Street, Kennebunk, ME 04043, Tel: 207-985-2973, TELEX: 46-9045, FAX: 207-985-4459; Empl.: 50; *Sls. Mgr.:* Susan Zilaro; *Dist. Mgr.:* Harold Baum

Ulveco

FAX: 415-573-7562

ULVECO, INC., 323 Vintage Park Drive, Foster City, CA 94404, Tel: 415-574-1100, TWX: 856446 ULVECO ..... **A•2502-2506**

Local Sales Offices & Reps

AL Huntsville, BCI, Inc. 205-539-4411
CA Arcadia, Van Gott & Assocs. 818-445-9728
CA Escondido, Van Gott & Assocs. 619-489-0893
CA Santa Clara, Gagner-Toomey Assocs., Inc. 408-244-2200
CO Littleton, MRC 303-794-4684
CT Avon, Tom Maguire Assocs. 203-673-3019
FL Margate, EPM Corp. 305-977-0331
MA Norwood, Tom Maguire Assocs. 617-551-0500
MN Minneapolis, Electro-Serv Co. 612-338-3475
NH Windham, Tom Maguire Assocs. 603-432-0363
NY Clark Mills, KLM Garner 315-853-6126
NY Pittsford, KLM Garner 716-381-8350
NY Plainview, Robert Smith Assocs. 516-681-3155
NC Charlotte, Electro-Rep Assocs. 704-527-2530
PA Exton, Linear Sls. 215-524-8080
VA Richmond, Glassock Assocs. 804-740-0063
WA Seattle, Northmar, Inc. 206-524-5170
Can Markham, Ont., Stetron Intl, Inc. 416-475-6202

UNADILLA ANTENNA MFG. CO., Ballardvale Station, P.O. Box 4215, Andover, MA 01810, Tel: 508-475-7831, FAX: 508-474-8949; Empl.: 6; *Sls. Mgr.:* P. Jannini

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UNGAR, Div. Eldon Inds., Inc., 5620 Knott Ave., Buena Park, CA 90620, Tel: 714-994-2510, TELEX: 4720750 Eldon; FSC No.: 78976; Empl.: 140; *Sls. Mgr.:* Richard Shivers

Local Sales Offices & Reps

AZ Tempe, Rich Sls. Co. 602-968-7787
CA Gardena, Ungar Sls. Assocs. 213-532-6837
CA San Clemente, Diversitech Reps. 714-240-7720
CA Sunnyvale, Techworld Inc. 408-291-8701
CO Denver, Remington/USA 303-752-1986
FL Lauderdale Lakes, PSR Technlgs. Inc. 305-753-5732
GA Lithia Springs, Effective Mktg. Force 404-948-6023
HI Compton, Ungar 213-774-5950
IL Itsaca, LTD Technlgs. 312-773-2900
IN Indianapolis, Robert Milsk Co. 317-842-3400
MA N. Reading, Yankee Tech 508-664-0865
MI Southfield, R. Milsk Co. 313-354-3310
MN Minneapolis, Milt Westlund Assocs. 612-866-5002
MO St. Louis, Thomas L. Dowell & Assocs. 314-849-4234
PA York, Classen & Doolittle Assocs. 717-741-1689
NY Oceanside, Bittan Assocs. 516-678-6222
NY Orchid Pk., Davis-Callahan Co. 716-662-5988
OH Monroe, Wiethe & Young Assoc. 513-539-7436
OR Portland, Joseph V. Belusko Co. 503-222-4279
TX Dallas, Rich Sls. 214-257-0761
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EXP Inglewood, Eldon Industries, Inc. 213-642-7716

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TX	Houston, Ammon & Rizos	713-781-6240
TX	Richardson, Ammon & Rizos	214-644-5591
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Can	Richmond Hill, Renmark Elctms.	416-881-8844

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EXP London, England, Stansberry Assoc. Int'l, Inc. 01-467-0535
Can Toronto, Ont., Datacomp Elctrns. 416-533-4076

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FAX: 213-531-6217

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URDC, Acme Electric Corporation, 7915 South 1530 West, Box 10, West Jordan, UT 84084, Tel: 801-561-9385, FAX: 801-562-9004; *Sls. Mgr.:* Leland Coleman

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CA Oceanside, Noo Rep Tech Sls. 619-941-0558
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CA San Jose, U.S. Toyo Fan Corp. 408-434-1615
CO Lakewood, Christee-Meade 803-232-0287
CT Bethel, Livera-Polk Assocs. Inc. 203-748-4639
FL Winter Springs, Sunland Assocs. 305-365-9533
IL Elk Grove, Parcom Inc. 312-228-6360
KS Lenexa, Midtec Assocs. 913-541-0505
MD Columbia, Dalbrook Corp. 301-740-4346
MA Needham, Component Technlg. 617-449-8490
MI Farmington Hills, W. R. Hummon 313-474-0661
MN Minneapolis, Stan Clothier Co. 612-944-3456
MO St. Louis, Midtec Assocs. 314-275-8666
NJ Madison, Livera-Polk Assocs. 201-377-3220
NY Cooperstown, Fitzelle Assocs. 607-547-9333
NY Glen Head, Livera-Polk Assocs. 516-759-9300
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NV Las Vegas, Kiesub Corp. 702-733-3888
NJ Corbin City, Index 609-628-4040
NM Albuquerque, Betatron 505-821-1122
NY Elmsford, Multimetrics 914-347-3666
NY Endwell, Pryme-Line Distr. 607-748-5200
OH Richfield, Alpha Distr. Corp. 216-659-7100
OR Beaverton, Hansen Elctrns. 503-642-4455
PA Harrisburg, Cumberland Elctrns. 717-233-5883
TX Dallas, Cypress Elctrns. 214-869-1435
TX Richardson, Zec Sls. 214-669-0895
WA Bothell, Cypress Elctrns. 206-483-1144

UTE MICROWAVE, 3500 Sunset Ave., Asbury Park, NJ 07712, Tel: 201-922-1009, TELEX: 13-2461, FAX: 201-922-0848; FSC No.: 23261; Empl.: 35

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CA San Diego, Mesa Engrg. 619-268-3500
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CA Torrance, Cutlass Elctrns. 213-324-7360
CO Englewood, Barnhill Assocs. 303-799-6999
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FL Tampa, Currie, Peak & Frazier 813-968-2480
FL W. Melbourne, Currie, Peak & Frazier 407-724-6795
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MA Hokinton, Eastern Sys. 508-435-2151
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CA	San Mateo, Stewart Fullerton Assocs.	415-570-7666
CT	Cheshire, Sci. Comps.	203-272-2963
MD	Ellicott City, Technlg. Sls.	301-461-7802
MO	St. Charles, Livera-Polk	314-946-8500
NJ	Madison, Livera-Polk	201-377-3239
NY	Glen Head, Livera-Polk	516-759-9300
NC	Lillington, EMF	919-893-3650
OH	Beachwood, Thompson & Assocs.	216-831-6277
OH	Dayton, Thompson & Assocs.	513-435-7733
OR	Portland, VMI	503-252-5197
PA	West Chester, TCA Assocs.	215-353-2022
TX	Richardson, Comp. Technlg.	214-783-8831
WA	Redmond, VMI	206-882-2999
Can	Mississauga, Ont., K.C. Sls. & Mktg.	416-826-5435
Can	Mississauga, Ont., Nica Power Battery Corp.	416-828-7100

Local Distributors

AZ	Phoenix, Specific Energy Corp.	602-433-0288
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CA	Mtn. View, Energy Sls.	415-969-0800
CA	San Jose, Rose Elctrns.	408-263-9700
CA	Van Nuys, Nesco, Inc.	818-781-0505
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FL	Altamonte Springs, TNR Tech., Inc.	305-767-2411
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GA	Marietta, Synergistic Batteries	404-973-2220
HI	Honolulu, Pacific Energy Dvcs.	808-737-2021
IL	Donwers Grove, Telecommunications Dvcs.	312-971-3460
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MD	Beltsville, Mark Elctrns.	301-595-5040
MA	Sharon, Adcour	617-784-8123
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NJ	Butler, Access Distrs.	201-492-0808
NJ	Clifton, Engrd. Assemblies	201-340-0600
NY	Elmsford, Energex Sys. Corp.	914-631-1363
NY	Mt. Kisco, Multiplier Inds.	914-699-0990
NC	Winston-Salem, Progressive Technlgs.	919-761-1375
OR	Aloha, Elctrn. Concept	503-642-9715
TX	Spring, Battery Pak Sls. & Svc.	713-367-9393
TX	Stafford, S.W. Elctrns.	713-240-4000
WA	Redmond, Energy Sls., Inc.	206-883-2343
Can	Mississauga, Ont., NICA Power Battery Corp.	416-828-7100

VASAK INDS., INC., 27 Cleveland St., Valhalla, NY 10595, Tel: 1-800-67-VASAK, FAX: 914-761-5009; Empl.: 10; *Sls. Mgr.:* John Vasak

VCH INCORPORATED, Chicago Miniature, 1080 Johnson Drive, Buffalo Grove, IL 60089, Tel: 312-459-3400, TWX: 910-221-5445, FAX: 312-459-2708; FSC No.: 71744; Empl.: 52; *Sls. Mgr.:* Jim Flanagan

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AL	Huntsville, Allied Elctrns. Inc.	1-800-433-5700
AL	Huntsville, Mock Elctrns. Inc.	205-539-2401
AL	Huntsville, Pioneer Technlgs.	205-837-9300
AL	Huntsville, W & W Elctrns. Inc.	205-534-0376
AZ	Phoenix, Dalis Elctrns.	602-275-2885
AZ	Phoenix, Elctrn. Supp.	602-276-1199
AZ	Phoenix, Tri-Tek Inc.	602-371-0860
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AR	Little Rock, Carlton Bates	501-562-9100
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CA	Canoga Pk., Sandy's Elec. Supp.	818-346-8353
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CA	Costa Mesa, Dow Radio	714-645-6448
CA	Costa Mesa, Marvac Elctrns.	714-650-2001
CA	Costa Mesa, Powell	714-754-1717
CA	Fremont, Allied Elctrns.	415-770-0590
CA	Fremont, Fry's Elctrns.	415-770-3797
CA	Fullerton, Orvac Elctrns.	714-871-1020
CA	Gardena, Cal Switch	213-770-2330
CA	Hollywood, Yale Elctrns.	213-465-3186
AL	Huntsville, Powell Elctrns.	205-539-2731
CA	Inglewood, Newark Elctrns.	213-670-0020
CA	Irvine, Priority 1 Elctrns.	714-660-1411
CA	Los Angeles, ITC Elctrns.	213-388-0621
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CA	Pasadena, Empire Elctrn. Dist.	213-681-2711
CA	Riverside, Elctrn. Supp.	714-787-9220
CA	Sacramento, Zack Elctrns.	916-369-1786
CA	San Diego, Cypress Elctrns.	619-535-0011
CA	San Diego, Elctrn. Supp.	619-693-8222
CA	San Diego, Shanks & Wright	619-239-0176
CA	San Diego, Western Radio Elctrns.	619-268-4400
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CA	San Jose, Elctrn. Supp.	408-297-3726
CA	San Jose, Powell Elctrns.	408-943-9020
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CA	Santee, Mouser Corp.	619-449-2300
CA	Sunnyvale, Abacus Elctrns. Co.	408-732-2000
CA	Sunnyvale, Fry's Elctrns.	408-733-0115
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CA	Tustin, Allied Elctrns. Inc.	714-669-4190
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CO	Englewood, Shelley/Ragon	303-762-0670
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CT	Greenwich, Wise Comps. Inc.	203-531-4880
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CT	Norwalk, Pioneer Stand. Elctrns. Inc.	203-853-1515
CT	S. Windsor, Car-Lac Elctrns.	203-282-0631
CT	Wallingford, Sager Elec. Supp. Co.	203-265-4600
FL	Altamonte Springs, Pioneer Tech. Sls.	407-834-9090
FL	Ft. Lauderdale, Pioneer Technlg.	305-428-8877
FL	Ft. Lauderdale, Powell Elctrns.	305-484-8377
FL	Ft. Lauderdale, Southeastern Elect. Inc.	305-563-4131
FL	Miami, Elctrn. Equip.	305-871-3500
FL	Pompano Bch., Peerless Radio Corp.	305-973-4141
GA	Atlanta, Jack Spears Elctrns.	404-237-4531
GA	Norcross, Allied Elctrns. Inc.	404-377-3555
GA	Norcross, Newark Elctrns.	404-448-8500
GA	Norcross, Pioneer Technlgs.	404-448-1711
IL	Bensonville, GBL Goold Elctrns.	312-860-7171;800-323-6639
IL	Champaign, Klaus Radio, Inc.	217-356-1856
IL	Chicago, Newark Elctrns.	312-784-5100
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IL	Palatine, OHM Elctrns.	312-359-5500
IL	Peoria, Klaus Radio	309-691-4840
IL	Schaumberg, Newark Elctrns.	312-310-8980
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IN	Indianapolis, Bell Inds.	317-875-8200
IN	Indianapolis, Meunier Elctrns.	317-635-3511
IN	Indianapolis, Newark Elctrns.	317-872-7070
IA	Cedar Rapids, Dee Elctrns., Inc.	319-365-7551
KS	Overland Park, Newark Elctrns.	913-677-0727
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MD	Baltimore, ASI Elctrns.	301-265-5100
MD	Baltimore, Resco/Baltimore	301-529-0500
MD	Columbia, Newark Elctrns.	301-964-4482
MD	Columbia, Powell Elctrns. Inc.	301-995-6410
MD	Gaithersburg, Pioneer Technlgs.	301-921-0660
MD	Rockville, Capitol Radio Whlsirs.	301-881-2270
MA	Boston, Active	508-366-8899
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MA	Lexington, Pioneer Inc.	617-861-9200
MA	Lynn, Land Elctrn. Supp.	617-592-2220
MA	Milford, Car-Lac Elctrns.	617-478-7797
MA	Needham, Cronin Elctrns.	617-449-5000
MA	Needham, YDI Elctrns. Corp.	617-449-1005
MA	Norwood, Gerber Elctrns.	617-769-6000
MA	Westborough, Powell Elctrns.	508-366-6100
MA	Wocester, Newark Elctrns.	508-756-0702
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MI	Lansing, Wedemeyer Elec. Supp.	517-484-9047
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MI	Livonia, Pioneer Std.	313-525-1800
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MI	Southfield, Newark Elctrns.	313-557-8227
MN	Minneapolis, Acme Elctrns. Inc.	800-328-0270
MN	Minneapolis, Newark Elctrns.	612-331-6350
MN	Minneapolis, Shelley/Ragon Inc.	612-642-2828
MN	St. Paul, Gopher Elctrns.	612-483-3322
MN	Thief River Fls, Digi-Key Corp.	800-344-4539
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MO	Maryland Hgts., Chelsea Elctrns.	314-426-4500
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NH	Salem, Sager Elctrl.	603-898-1348
NJ	Camden, GRS Co.	609-964-8560
NJ	E. Hanover, State Elctrn. Parts Co.	201-887-2550
NJ	Englewood, Powell Elctrns.	201-894-0800
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NJ	Mt. Laurel, Active	609-273-2700
NJ	Mt. Laurel, Future Elctrns.	609-778-7600
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NJ	Pine Brook, Pioneer Stand. Elctrn.	201-575-3510
NM	Albuquerque, Elctrn. Parts Co.	505-293-6161
NY	Binghamton, Pioneer Elctrns.	607-722-9300
NY	Bohemia, Car-Lac Elctrns.	516-567-4200, 800-645-1192
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NY	Commack, Car-Lac Elctrns.;NY Branch Sls. Off.	516-493-0556,800-433-0387
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NY	Hempstead, Davis Elctrns.	516-483-9200
NY	L.I. City, H. L. Dalis	718-361-1100
NY	Lynbrook, Peerless Radio Dist. Inc.	516-593-2121
NY	Mineola, Allied Elctrns. Inc.	516-248-2360
NY	Rochester, Simcona Elctrns.	716-328-3230
NY	Rochester, Summit Dists. Inc.	716-334-8110
NY	Ronkonkoma, Arrow Elctrns., Inc.	800-932-7769
NY	Woodbury, Pioneer Stand. Elec.	516-921-8700
NC	Cary, Powell Elctrns.	919-467-1212
NC	Charlotte, Pioneer Technlgs.	704-527-8188
NC	Raleigh, Allied Elctrns. Inc.	919-876-5845
NC	Raleigh, Southeastern Elctrns.	919-828-2311
OH	Akron, Akron Elect. Supp. Inc.	216-762-8818
OH	Cincinnati, Hughes Peters Inc.	513-351-2000
OH	Cleveland, Pioneer Stand. Elec.	216-587-3600
OH	Columbus, Hughes Peters Co.	614-294-5351
OH	Columbus, Wedemeyer Elec. Supp.	614-436-9600
OH	Dayton, Pioneer-Dayton	513-236-9900
OH	Dayton, Stotts-Friedman Co.	513-298-5555
OR	Beaverton, Almac Elctrns.	503-629-8090
OR	Beaverton, Norvac Elctrns.	503-644-1025
OR	Portland, Radar Elec. Co.	503-232-3404
PA	Drexel Hill, Kass Elctrn. Dist.	215-449-2300
PA	Harrisburg, Cumberland Elect. Inc.	717-232-9715
PA	Horsham, Pioneer Technlgs.	215-674-4000
PA	McKean, Advacorn, Inc.	814-476-7774
PA	Philadelphia, Powell Elctrns.	215-365-1900
PA	Pittsburgh, Pioneer Std.	412-782-2300
PA	Reading, Barbey Elctrns.	215-376-7451
PA	Willow Grove, RESCO Elctrns.	215-659-4575
SC	Charleston, Wholesale Indl. Elec.	803-722-2634

TN Nashville, Carlton Bates 615-244-3562
TX Austin, Pioneer Std. 512-835-4000
TX Dallas, Harrison Equip. Co., Inc. 214-239-2750
TX Dallas, Off-the-Shelf Comps. 214-247-0052
TX El Paso, Ideal Indl. Elec. 915-779-6647
TX Ft. Worth, Allied Elctrns. 817-336-5401
TX Garland, Newark Elctrns. 214-494-5911
TX Houston, Newark Elctrns. 713-999-0529
TX Houston, Pioneer Std. 713-988-5555
TX Irving, Powell Elctrns. 214-550-0547
TX Mansfield, Mouser Elctrns. 817-483-4422
TX Richardson, Off-the-Shelf Comps. 214-238-0808
TX Stafford, Harrison Equip. Co. 713-879-2600
UT Salt Lake City, Kimball Elctrns. Inc. 801-328-2075
UT Salt Lake City, Stand. Supp. 801-486-3371
VA Arlington, Arlington Elec. Whslrs. 703-524-2412
VA Norfolk, Priest Elctrns. 804-855-0105
WA Bellevue, Active 206-881-8191
WA Bellevue, Almac Elctrns. 206-643-9992
WA Seattle, Radar Elec. Co. 206-282-2511
WA Spokane, Almac Elctrns. 509-924-9500
WA Spokane, Radar Elctrns. 509-747-3053
WI Milwaukee, Marsh Elctrns. 414-475-6000

VECTOR ELECTRONIC CO., 12460 Gladstone Ave., Sylmar, CA 91342, Tel: 818-365-9661, FAX: 818-365-5718; Empl.: 95 ..... **C•1121, 1722, 1727-1729; D•1122-1123**

VECTRONICS MICROWAVE CORP., 113 Lincoln Blvd., Middlesex, NJ 08846, Tel: 201-356-2377, TELEX: 833560; FSC No.: 32846; Empl.: 51; *Sls. Mgr.:* John G. Vogler

VECTRON LABORATORIES, INC., 166 Glover Ave., Norwalk, CT 06850, Tel: 203-853-4433, TWX: 710-468-3796, FAX: 203-849-1423; FSC No.: 27802; Empl.: 325; *Sls. Mgr.:* Larry Jawitz ..... **A•1492-1497**

Local Sales Offices & Reps

AL Huntsville, Saber Assocs. 800-327-0853
AZ Mesa, Fetty/Schoenduve 602-241-9009
CA El Segundo, Fetty/Schoenduve 213-322-4991
CA Mountain View, Fetty/Schoenduve ... 415-962-8330
CA San Diego, Fetty/Schoenduve 619-292-5136
CO Parker, Techn. Mktg. Assocs. 303-841-3435
CT Cheshire, Meco 800-225-3409
FL Melbourne, Saber Assocs. 800-432-6288
GA Norcross, Saber Assocs. 800-327-0853
IL Bannockburn, GMR Sls., Inc. 312-295-8440
IN Greenwood, Valentine & Assocs. 317-888-2260
IN South Bend, Valentine & Assocs. 219-288-7070
IA Anamosa, WG Controls 319-462-3456
MO Independence, Engrg. Svcs. Co. 816-254-3600
MA Reading, Meco 617-944-6660
MI Detroit, R. P. Urban Assocs. 313-535-2355
MI Grand Rapids, R. P. Urban Assocs. ... 616-245-0511
MN Burnsville, Allied Comp. Reps. 612-435-7876
MO St. Louis, Engrg. Svcs. Co. 314-997-1515
NY Great Neck, F & F Metro 516-482-4080
NM Albuquerque, J. Smith & Assocs. 505-345-6501
NY Syracuse, T–Squared Elctrns. 315-463-8592
NC Clayton, Saber Assocs. 800-327-0853
OH Englewood, A. Nace Co. 513-836-0931
OH Hudson, A. Nace Co. 216-656-3273
PA Newtown Sq., SWR Tech., Inc. 215-353-6639
TX Dallas, Texas Avionics 214-437-5677
UT Salt Lake City, Techn. Mktg. Assocs. .. 801-483-1009
VA Alexandria, Tech-Reps 703-370-2600
WA Seattle, Datacom 206-285-2525
Can Montreal, Ont., Soquelec, Ltd. 514-482-6427

VEECO INSTRUMENTS INC., Terminal Dr., Plainview, NY 11803, Tel: 516-349-8300; *Sls. Mgr.:* Robert Kase

VEECO INTEGRATED AUTOMATION, INC., Veeco Instruments Inc., 10480 Markison Rd., Dallas, TX 75238, Tel: 214-349-8482

VEEDER-ROOT, 70 Sargeant St., Hartford, CT 06102, Tel: 203-527-7201, FAX: 203-527-1479; Empl.: 1200; *Sls. Mgr.:* Alan Schoenhut; *Dist. Mgr.:* Alan Schoenhut

VEETRONIX

FAX: 303-324-4985

VEETRONIX, INC., Box 480, Lexington, NE 68850, Tel: 308-324-4600; Empl.: 25; *Sls. Mgr.:* Eddie Howerter ..... **B•1852-1853**

VEGA PRECISION LABS., 800 Follin La., Vienna, VA 22180, Tel: 703-938-6300, TELEX: 89-2521; FSC No.: 23115; Empl.: 350; *Sls. Mgr.:* Joe E. Bennett

VEKTREX ELECTRONIC SYSTEMS, INC., P.O. Box 490, Imperial Bch., CA 92032, Tel: 619-753-0408; FSC No.: 0BV42; Empl.: 5

VELMEX, INC., P. O. Box 38, East Bloomfield, NY 14443, Tel: 716-657-6151, 800-642-6446, FAX: 716-657-6153; Empl.: 30; *Sls. Mgr.:* R. Yurick

VELONEX, 560 Robert Ave., Santa Clara, CA 95050, Tel: 408-727-7370, FAX: 408-727-0389; Empl.: 40; *Sls. Mgr.:* Kevin M. Coffey ..... **D•1421**

VELONEX, 6551 Loisdale Ct., Ste. 322, Springfield, VA 22150, Tel: 703-922-8005, FAX: 703-922-8007

VEMALINE PRODS. DIV., 333 Strawberry Field Rd., P.O. Box 6979, Warwick, RI 02887, Tel: 401-739-7600, FAX: 401-732-6119; FSC No.: 08730; *Sls. Mgr.:* Paul Vamvaketis

VENABLE INDUSTRIES, INC., 3555 Lomita Blvd., Torrance, CA 90505, Tel: 213-539-2522, FAX: 213-539-4139; Empl.: 20; *Sls. Mgr.:* C.B. Dreyer

VENT RAK, See General Devices

VERMONT AUTOMATION CO., INC., 18 Morse Dr., Essex Junction, VT 05452, Tel: 802-879-7571; Empl.: 7; *Sls. Mgr.:* G. Cox

VERMONT PRECISION RESISTOR, Codeco Corp. of Vermont, West Hill Road, P.O. Box 1207, Stowe, VT 05672-1207, Tel: 802-253-8567, FAX: 802-253-8019; Empl.: 8

VERMONT RESEARCH CORP., Precision Pk., N. Springfield, VT 05150, Tel: 802-886-2256, TWX: 710-363-6533; Empl.: 45; *Sls. Mgr.:* John Dimitruk

VERMONT SEMICONDUCTOR, INC., 7 Ave.D, PO Box 526, Williston, VT 05495, Tel: 802-865-3000, FAX: 802-865-3800; Empl.: 70

VERNITECH:VERNITRON CORP., 300 Marcus Blvd., Deer Pk., NY 11729, Tel: 516-586-5100, TWX: 510-227-6079; FSC No.: 30223; Empl.: 225 .... **A•2147; B•1037, 1316, 1998**

Local Sales Offices & Reps

AZ Fountain Hills, Halbar Assoc. 602-837-2464
AZ Fountain Hills, Halbar Assocs. 602-837-2464
CA Glendale, Halbar Assoc. 818-246-8263
CA Glendale, Halbar Assocs. 213-246-8263
CO Wheat Ridge, Waugaman Assocs. 303-423-1020
CO Wheatridge, Waugaman Assocs. 303-423-1020
CT North Haven, Kitchen & Kutchen, Inc. 203-239-0212
FL Madiera Beach, Mackay, Smith & Assoc., Inc. 813-530-1873
FL Orlando, MacKay Smith & Assocs. 305-423-4353
IL Palatine, Technlg. Sls. 312-991-6600
IL Palatine, Technology Sls. 312-991-6600
IA Davenport, Rush & West 319-388-9494
KS Olathe, Rush & West 913-764-2700
MD Monkton, Imagitron Sls. Co., Inc. 301-374-5600
MA Burlington, Kitchen & Kutchen Inc. 617-229-2660
MN Minneapolis, Boerger & Assocs. 612-560-3435
MO St. Louis, Rush & West Assocs., Inc. .. 314-965-3322
NJ Cherry Hill, Lanson Assoc. 609-424-4670
NY Melville, Comtronic Engrg. Sls. 516-249-0505
NY Melville, Comtronics Eng. & Sls. 516-249-0505
NY Syracuse, T-Squared Co. 315-463-8592
NY Syracuse, T-Squared Elctrn. Sls. 315-463-8592
NY Victor, T-Squared 716-924-9101
OH Beachwood, Electronic Salesmasters, Inc. 216-831-9565
OH Dayton, J. C. Hofstetter Co. 513-296-1010
OH Medina, J. C. Hofstetter Co. 216-241-4880
OH Medina, J.C. Hofstetter & Co. 216-241-4880
TX Ronoake, CMR 817-379-6540
UT Salt Lake City, Waugaman 801-261-0802
UT Salt Lake City, Waugaman Assocs. 801-261-0802
WA Bellevue, Schultz Co. 206-454-0300
WI Milwaukee, Technology Sls., Inc. 414-964-5015

VERNITRON CONTROLS, Vernitron Corporation, 1601 Precision Park La., San Diego, CA 92073, Tel: 619-428-5581, TWX: 910-322-1862, FAX: 619-428-5090; FSC No.: 10112; Empl.: 200; *Sls. Mgr.:* R. Campbell ..... **B•1313-1315**

Local Sales Offices & Reps

AZ Fountain Hills, Halbar Assocs. 602-837-2464
CA Glendale, Halbar Assocs. 818-246-8263
CA Mtn. View, Westech Sls. 415-961-1422
CO Wheat Ridge, Waugaman Assocs. 303-423-1020
CT North Haven, Kitchen & Kutchin 203-239-0212
FL Madeira Beach, Mackay, Smith & Assocs., Inc. 813-393-7144
FL Orlando, Mackay Smith & Assocs. 305-423-4353
GA Dunwood, Ken Raby 404-396-5848
IL Palentine, Technology Sls. 312-991-6600
MA Burlington, Kitchen & Kutchin 617-229-2660
MO St. Louis, Rush & West 314-965-3332
NJ Cherry Hill, Lanson Assocs. 609-424-4670
NY Jericho, Metro Tech. Sls. 516-935-3330
NY Syracuse, T-Squared Elctrns., Inc. 315-463-8592
NY Victor, T-Squared Elctrns., Inc. 716-924-9101
OH Dayton, Rixan Assocs. 513-222-0011
TX Dallas, CMR 817-379-6540
UT Salt Lake City, Waugaman Assocs. ... 801-261-0802
VA Fredericksburg, Vernitron 703-752-4499

VRN INTERNATIONAL

FAX: 813-347-7520

VERNITRON CORP., VRN Div., 2801 72nd St. N., Box 44000, St. Petersburg, FL 33743, Tel: 813-347-2181, TELEX: 6815306, TWX: 310-681-5306; FSC No.: 84048; Empl.: 400; *Sls. Mgr.:* P. Healy; *Dist. Mgr.:* P. Healy ..... **A•2148-2150; B•1038; D•1065**

Local Sales Offices & Reps

AL Huntsville, R. O. Whitesell & Assoc. ... 205-883-5110
AZ Phoenix, Shefler-Kahn 602-257-9015
CA Burlingame, Wm. J. Purdy Co. 415-347-7701
CA Campbell, Kottmeier Assocs. 408-371-8700
CO Englewood, Omega, Ltd. 303-762-1921
CT Farmington, R. Perron Co. 203-673-4825
FL Orlando, Cartwright & Bean 305-422-4531
IL Downers Grove, Circuit Sls. 312-833-2242
IN Fort Wayne, Ro Whitesell & Assocs. .. 219-432-5591
IN Indianpolis, Ro Whitesell & Assocs. ... 317-359-9283
IN Kokomo, Ro Whitesell & Assocs. 317-457-9127
KS Merriam, MTS 913-236-8557
KY Louisville, Ro Whitesell & Assocs. 502-426-7696
MI Grand Rapids, Ro Whitesell & Assocs. 616-942-5420
MI Southfield, Ro Whitesell & Assocs. 313-559-5454
MI St. Joseph, Ro Whitesell & Assocs. ... 616-983-7337
MN Minneapolis, PSI 612-944-8545
NM Albuquerque, Shefler-Kahn 505-345-3591
NY Great Neck, Mos Assocs. 516-487-3966
NY Syracuse, Pi'tronics 315-435-7346
OH Cincinnati, Ro Whitesell & Assocs. 513-521-2290
OH Cleveland, Ro Whitesell & Assocs. 216-447-9020
OH Columbus, Ro Whitesell & Assocs. ... 614-888-9396
OH Dayton, Ro Whitesell & Assocs. 513-298-9546
OK Tulsa, Comptech 918-622-7744
PA Lawrenceville, DVS 609-896-1112
PA Pittsburg, Ro Whitesell & Assocs. 412-963-6161
TX Arlington, Comptech 817-265-6007
UT Salt Lake City, Omega, Ltd. 801-277-8061
VA Charlottesville, LD Lowery 804-973-6672
Can Rexdale, Ont., Source Elec., Ltd. 613-592-5392

Local Distributors

AR Little Rock, Carlton-Bates 501-562-9100
CA Chatsworth, TTI 818-709-1010
CA San Diego, Shelley-Ragon 619-453-7133
CA San Jose, Future 408-945-9100
CA San Jose, Shelley-Ragon 408-942-9111
CA Thousand Oaks, Bell Inds. 818-340-1940
CO Denver, Denver-Wintronics 303-431-7161
CT Bethel, Future 203-847-6442
CT Norwalk, Cobra Comps. 203-847-6442
CT Wallingford, Sager Elctrl. Supp. 203-265-4600
FL Clearwater, Future 813-441-4771
FL Ft. Lauderdale, NRC Elctrns. 305-772-4500
FL Orlando, TTI Inc. 305-849-1000
FL Tampa, Impala Elctrns. 813-885-4747
GA Norcross, TTI 404-662-0911
IL Lisle, Components Inc. 312-852-7707
IL Lombard, Shelley Ragon 312-595-6633
IA Cedar Rapids, Dee Elctrns. 319-365-7551
MA Woburn, TTI Inc. 617-938-8800
MD Columbia, TTI 301-995-1331
MD Rockville, M S Elctrns. 301-340-6400
MA Hingham, Sager Elctrl. Supp. 617-749-6700
MA Westboro, Future 617-366-2400
MI Farmington Hills, Advent Elctrns. 313-477-1650
MN Eden Prarie, TTI 612-944-5080
MN St. Pauls, Shelley Ragon 612-642-2823

MO St. Louis, Chelsea 314-426-4500
NJ Berlin, GCI 609-768-6767
NJ East Hanover, State Elctrns. 201-887-2550
NJ Mt. Laurel, Future 609-778-7600
NJ New Brunswick, Brothers Elctrns. 201-238-2200
NJ Whippany, Tonar Ind. 201-884-1400
NM Albuquerque, Sterling 505-884-1900
NY Albany, Adirondacks 518-456-0203
NY Buffalo, Summit 716-887-2800
NY Farmingdale, Command Elctrns. Corp. 516-293-1212
NY Hauppauge, Fairmont Elec. Sls. 516-231-3313
NY Hauppauge, Jaco Elctrns. 516-273-5500
NY Liverpool, Future 315-451-2371
NY Ronkonkoma, TTI Inc. 516-737-2000
NY Valley Stream, L & S Elctrns. 516-561-2474
NC Charlotte, Elctrns. Mktg. 704-394-6195
NC Raleigh, Southeastern 919-828-2311
OH Columbus, Elctrns. Mktg. 614-299-4161
OH Dayton, Bell Micro-Mil 513-434-8231
OK Tulsa, Radio 918-587-9123
PA Braddock, Leff 412-351-5000
PA Montgomeryville, Pyttronic 215-643-2850
PA Philadelphia, PEI Genesis 215-568-7400
TX Ft. Worth, TTI Inc. 817-831-0441
TX Houston, Sterling 713-627-9800
TX Richardson, Altair 214-231-5166
UT Salt Lake City, Future 801-972-8489
VA Charlottesville, Virginia Radio 804-296-4184
WA Bellevue, Future 206-881-8199
WA Redmond, Priebe Elec. Inc. 206-881-2363
WI Milwaukee, Marsh Elctrns. 414-475-6000
Can Pointe Claire, Que., Future Elctrns. 514-694-7710

VERNITRON ELEC. COMPS., See Beau Prods. Div.

Vernitron

FAX: 216-232-8731

VERNITRON PIEZOELECTRIC DIV., 232 Forbes Rd., Bedford, OH 44146-5478, Tel: 216-232-8600, TWX: 810-427-2274; Empl.: 100; *Sls. Mgr.:* Mark Montie ... **A•1499**

Local Sales Offices & Reps

AL Hunstville, R. O. Whitesell & Assoc. ... 205-883-5110
FL Orlando, B & M Sls. 305-855-2455
GA Norcross, R. O. Whitesell & Assoc. 404-449-9190
IL Des Plaines, Esco Assoc. 312-298-5310
IN Ft. Wayne, R. O. Whitesell & Assoc. ... 219-432-5591
IN Indianapolis, R. O. Whitesell & Assoc. 317-359-9283
IN Kokomo, R. O. Whitesell & Assoc. 317-457-9127
KY Pewee Valley, R. O. Whitesell & Assoc. 502-241-1441
MD Sykesville, DVS Company 301-781-4080
MI Grand Blanc, R. O. Whitesell & Assoc. 313-695-0770
MI Grand Rapids, R. O. Whitesell & Assoc. 616-942-5420
MI Southfield, R. O. Whitesell & Assoc. ... 313-559-5454
MI St. Joseph, R. O. Whitesell & Assoc. .. 616-983-7337
NJ Lawrenceville, DVS Company 609-896-1112
NC Fuguay-Varina, R. O. Whitesell & Assoc. 919-552-1122
NC Greenboro, R. O. Whitesell & Assoc. .. 919-273-1945
OH Cincinnati, R. O. Whitesell & Assoc. ... 513-521-2290
OH Cleveland, R. O. Whitesell & Assoc. ... 216-447-9020
OH Columbus, R. O. Whitesell & Assoc. ... 614-888-9396
OH Dayton, R. O. Whitesell & Assoc. 513-298-9546
OK Tulsa, CompTech 918-622-7744
PA Pittsburgh, R. O. Whitesell & Assoc. ... 412-963-6161
TN Knoxville, R. O. Whitesell & Assoc. 615-694-9476
TN Nashville, R. O. whitesell & Assoc. 615-352-4760
TX Austin, CompTech 512-343-0300
TX Houston, Comptech 713-492-0005
TX Irving, CompTech 214-751-1181

VERN KIEBLER ASSOC., 201 N. Gables, Wheaton, IL 60187, Tel: 312-668-5407, FAX: 312-462-7590; Empl.: 200; *Sls. Mgr.:* Wm. Archbold

VERSACAD CORPORATION, Prime Computer, Inc., 2124 Main St, Huntington Bch., CA 92648, Tel: 714-960-7720, TWX: 510-101-1759 TWINC UD; Empl.: 75; *Sls. Mgr.:* Everett Dickson; *Dist. Mgr.:* Glenn Johnson

VERSALOGIC, 3888 Stewart Rd., Eugene, OR 97402, Tel: 503-485-8575, FAX: 503-485-5712

VERTEK INTL. INC., 6775 CustomHouse Plaza Ste.D , San Diego, CA 92073, Tel: 619-661-6868, FAX: 706-686-3444 (Mexico); Empl.: 150

VERTEX INDUSTRIES, INC., P. O. Box 996, 23 Carol St., Clifton, NJ 07014, Tel: 201-472-1331, FAX: 201-472-0814; Empl.: 85; *Sls. Mgr.:* Carlo Pastore

VERTOX CO., 10022 Imperial Ave. E , Garden Grove, CA 92643, Tel: 714-530-4541, FAX: 714-530-0143; FSC No.: 53688; Empl.: 12; *Sls. Mgr.:* Steve Hacker; *Dist. Mgr.:* Steve Hacker

VESTA TECHNOLOGY, INC., 7100 W. 44th Ave. Ste 101, Wheat Ridge, CO 80033, Tel: 303-422-8088, FAX: 303-422-9800; Empl.: 9

VIABLE SYSTEMS INC., Box 369, Sherborn, MA 01770, Tel: 508-653-7665, TELEX: 922 495 VIABLEUS, FAX: 508-653-6645; Empl.: 30

VIA WEST INTERFACE, INC., 534 N. Stone Ave., Tucson, AZ 85705, Tel: 602-623-5716; Empl.: 4; *Sls. Mgr.:* Robert S. Bos

VIBRAC, 16 Columbia Dr., Amherst, NH 03031, Tel: 603-882-6777, TELEX: 312698 VIBRAC, FAX: 603-886-3857; Empl.: 50; *Sls. Mgr.:* R. Searle

Vibra-Metrics INC.

FAX: 203-288-4937

VIBRA-METRICS, INC., 1014 Sherman Ave., Hamden, CT 06514, Tel: 203-288-6158, 1-800-352-2001, TWX: 710-465-0169; Empl.: 25; *Sls. Mgr.:* Tom Golden ... **B•1999**

Local Sales Offices & Reps

AZ Mesa, Mayco, Inc. 602-491-1372
CA Canoga Pk., FLW 818-719-0037
CA Carlsbad, FLW 619-434-5251
CA Costa Mesa, FLW 714-751-7521
CO Parker, Heritage Chem. Co. 303-690-0589
CT North Haven, International Div. 203-288-1638
CT Wallingford, Pat Jenks Assocs. 203-265-9939
DC Columbia, Stein Instr. Corp. 301-596-3748
FL Orlando, FLW Southeast 407-894-1100
HI Kailua, FLW 808-954-1030
KS Olathe, Tech. Sls. Assoc. 913-829-2800
MA Beverly, Pat Jenks Assoc. 508-921-4600
MI Southfield, Comtel 313-358-2505
MI Southfield, Comtel Instrs. 313-358-2505
NM Albuquerque, Mayco, Inc. 505-299-4002
NY Baldwinsville, Oshex Assoc. 315-635-6027
NY Baldwinsville, Oshex Assocs., Inc. 315-635-6027
NC Raleigh, Lee Assoc. 919-848-8818
NC Raleigh, Lee-Carolinas 919-848-8818
OH Cleveland, Comtel 216-442-8080
OH Cleveland, Comtel Instrs. 216-442-8080
OH Dayton, Comtel Instrs. 513-426-5310
OH Hilliard, Comtel Instrs. 614-876-8305
OR Portland, Extech Ltd. 503-292-9219
PA Philadelphia, Metrasystems 215-247-7347
PA Philadelphia, MetraSystems 215-247-7347
PA Pittsburgh, Comtel Instrs. 412-922-5720
TN Chattanooga, Pump & Vibation Consits. 404-935-5851
TN Chattanooga, Pump & Vibration Consits. 404-935-5851
TX Argyle, Milestek, Inc. 817-455-7444
TX Argyle, MilesTek 817-455-7444
UT W. American Fork, Highland Tech. Mktg. 801-756-2634
UT West Amercan Fork, Highland Tech. Mktg. 801-756-2634
WI Elm Grove, James L. Griffin Co. Inc. 414-797-0980
WI New Berlin, Comtel -Midwest 414-544-6042
EXP New Haven, Masten Wright 203-288-1638
EXP New Haven, CT, Masten Wright 203-288-1638
Can Rexdale, SRP Control Syss. Ltd. 416-746-0117
Can Rexdale, Ont., SRP Control Sys. Ltd. .. 416-746-0117

VIBRATION INSTRUMENTS CO., 1614 Orangethorpe Way, Anaheim, CA 92801, Tel: 714-879-6085, TELEX: 692433; FSC No.: 32102; Empl.: 35; *Sls. Mgr.:* Fritz Egger

VIBRO-METER CORP., P.O. Box 5058, Billerica, MA 01822-5058, Tel: 508-663-7322, TELEX: 948145, TWX: 710-320-1872, FAX: 508-667-1944; FSC No.: 617-667-1944; Empl.: 50; *Sls. Mgr.:* Joe Micali

VICOM SYSTEMS, INC., 2520 Junction Avenue, San Jose, CA 95134, Tel: 408-432-8660, TELEX: 171-603; Empl.: 65; *Sls. Mgr.:* Neil Newman

VICON INDUSTRIES, INC., 525 Broad Hollow Rd., Melville, NY 11747, Tel: 516-293-2200, TELEX: 144581, FAX: 516-293-2627; Empl.: 284; *Sls. Mgr.:* Carol Ryan; *Dist. Mgr.:* Carol Ryan

VICTOREEN

FAX: 216-248-9301

VICTOREEN, INC., 6000 Cochran Rd., Solon, OH 44139, Tel: 216-248-9300, TWX: 810-421-8287 ..... **A•2062-2067**

Local Sales Offices & Reps

AZ Tempe, Ele-Comm Assocs. 602-844-0566
MA Newton, Victoreen, Inc. 617-964-2226
WA Edmond, EDCO Sls. 206-776-8922

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VONCO, INC., 22829 Heslip Drive, Novi, MI 48050, Tel: 313-344-0050, FAX: 313-344-0052; FSC No.: 7J499; *Sls. Mgr.:* Larry Ragsdale

VTM MICROWAVES, INC., 4975 W. 80 Ave., Westminster, CO 80030, Tel: 303-426-6866; FSC No.: 52474; Empl.: 15

V-TRON ELECTRONICS CORP., 10 Venus Way, P.O. Box 3297, S. Attleboro, MA 02703, Tel: 617-761-9100, FAX: 617-761-4727; Empl.: 250; *Sls. Mgr.:* Richard E. French

VU-DATA, 9180 Brown Deer Rd., San Diego, CA 92121, Tel: 619-452-7670, TWX: 910-335-1586, FAX: 619-452-2543; FSC No.: 34160; Empl.: 20; *Sls. Mgr.:* M. Knapp

WABASH MAGNETICS, Kearney-National Inc., 1375 Swan Street, Huntington, IN 46750, Tel: 219-356-8300, TWX: 510-100-2867, FAX: 219-356-3846; Empl.: 1000; *Sls. Mgr.:* Stanley P. Bickhart

WABASH MAGNETICS, First & Webster Streets, P.O. Box 708, Wabash, IN 46992, Tel: 219-563-2191, TWX: 810-290-2722, FAX: 219-563-1652; Empl.: 250; *Sls. Mgr.:* Bob Lunn ..... **B•1652-1653**

Local Sales Offices & Reps
AZ Fountain Hills, Halbar Assocs., INc. ... 602-837-2464
CA Glendale, Halbar 818-246-8263
CA San Mateo, Halbar 415-349-4700
CO Englewood, Computech 303-773-3981
FL Tampa, APM Assocs. 813-886-2457
GA Duluth, Dixie Tech. Mktg. 404-381-5592
IL Arlington Hgts., M. J. Petersen Assocs. 312-577-8200
IN Fort Wayne, M/S Sls. 219-436-3023
KS Lenexa, Midtec Assocs. 913-541-0505
MD Glen Burnie, Macrotech Assocs., Ltd. 301-766-1111
MA Andover, Crawford Assocs. 508-470-2122
MN Minneapolis, Des. Technlg. 612-424-7605
MO St. Louis, Midtec Assocs. 314-275-8666
NJ Watchung, Dolan Assocs. 201-753-2671
NC Raleigh, Dixie Tech. Mktg. 919-781-5745
TX Ft. Worth, El-Tec Sls., Inc. 817-268-2896
WA Redmond, Halbar Assocs., Inc. 206-882-0990

Local Distributors
CA Fullerton, Pyramid Elctrn. Supp. 714-773-0781
CA Santa Clara, Pyramid Elctrn. Supp. 408-727-9810
IL Elk Grove Village, Nu-Way Elctrn. Distrs. 312-437-7120
PA Philadelphia, Shap Elctrns. Co. 215-969-3300
WA Redmond, Pyramid Elctrn. Supp., Inc. 206-883-7200

WAGO CORP., 9085 N. Deerbrook Trail, Brown Deer, WI 53223, Tel: 414-354-5511, FAX: 414-354-1268; FSC No.: 65996; *Sls. Mgr.:* Michael A. Lane

WALDES TRUARC, INC., Member of the Seeger Fastening Sys. Grp., 29-01 Borden Ave., Long Island City, NY 11101-4478, Tel: 718-392-3100, TELEX: 126-829; Empl.: 450

WALKER POWER, INC., 10 B Mill St., Warner, NH 03278, Tel: 603-456-3111, FAX: 603-456-2498; Empl.: 115; *Sls. Mgr.:* Paul D. Iverson

WALKER SCIENTIFIC, Rockdale St., Worcester, MA 01606, Tel: 508-852-3674, 508-853-3232, TELEX: 9102508517, FAX: 508-856-9931; Empl.: 83; *Sls. Mgr.:* B. Langley ..... **D•1372**

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AL Birmingham, Levand Sci. Co. 800-222-2595
AZ Phoenix, Jensen Tools Inc. 602-968-6231
CA Irvine, Ion Spec 714-261-7743
CA Santa Barbara, Abbeon Cal, Inc. 805-966-0810
IL Chicago, McMaster Carr Supp. Co. 312-834-9600
IL McHenry, McHenry Elec. Co.
MD Baltimore, Applied Magnetics Lab 301-655-5800
NM Albuquerque, Mayco, Inc.
NY Rochester, Transcat 716-458-4801
OH Cincinnati, Bill Teplitz Assoc. 513-481-1648

Local Distributors
AL Birmingham, Levand Sci. Co. 800-222-2595
AZ Phoenix, Jensen Tools Inc. 602-968-6231
CA Irvine, Ion Spec 714-261-7743
CA Santa Barbara, Abbeon Cal, Inc. 805-966-0810
IL Chicago, McMaster Carr Supp. Co. 312-834-9600
IL McHenry, McHenry Elec. Co.
MD Baltimore, Applied Magnetics Lab 301-655-5800
NM Albuquerque, Mayco, Inc.
NY Rochester, Transcat 716-458-4801

WALL, A. T., CO., 55 Service Ave., Warwick, RI 02886, Tel: 401-739-0740, TWX: 710-382-1535, FAX: 401-732-5784; Empl.: 75; *Dist. Mgr.:* R. Huntsman

WALL-ABLE MFG. CORP., 2201 Landmeier Rd., Elk Grove Vl, IL 60007, Tel: 312-956-8000, TELEX: 312288 WLLABLE, FAX: 312-956-8082; Empl.: 150; *Sls. Mgr.:* Dennis O'Brien

WALL INDUSTRIES, 5 Watson Brook Rd., Exeter, NH 03833, Tel: 603-778-2300, 800-321-WALL, FAX: 603-778-9797; Empl.: 50; *Sls. Mgr.:* Dorothy Amato ..... **D•2128**

Local Sales Offices & Reps
AZ Scottsdale, Memco Sls. 602-952-2254
CA Hayward, Pacific Mktg. 415-887-1620
CA Pasadena, A-F Sls. Engrg. 213-681-5631
CO Aurora, Butler Tech. Sls. 303-651-7703
FL Maitland, Beacon Elctrns. 305-647-3496
GA Atlanta, Beacon Elctrns. 404-256-9640
IL Chicago, ESA Tech. Mktg. 312-544-0120
IN Indianapolis, Elctrn. Mktg. Conslts. 317-253-1668
MA Chelmsford, Encotronics 508-256-4207
MI East Detroit, Elect. Mktg. Conslts. 317-253-1668
MN Eden Prairie, High Technlg. Sls. 612-944-7274
MO St. Louis, Reptronics 314-576-9816
NJ E. Brunswick, Winch Sls. 201-613-1515
NY N. Syracuse, Labtronics 315-455-7314
OH Cleveland, E.M.C.I. 216-458-8486
PA Huntingdon Valley, Inacker Sls. 215-947-5660
TX Austin, Milco Mktg. Inc. 512-453-3023

TX Dallas, Milco Mktg. 214-783-2716
TX Houston, Milco Mktg. Inc. 713-723-5003
WA Kirkland, N.W. Comp. Sls. 206-828-2104
WI Madison, ESA Tech. Mktg. 312-544-0120
Can Oakville, Ont., Haltronics 416-844-2121

WALL LENK CORPORATION, Box 3349, Kinston, NC 28502-3349, Tel: 919-527-4186, FAX: 919-527-4189; Empl.: 60; *Sls. Mgr.:* Richard W. Cooper

WAMCO, INC., 11555-A Coley River Cir., Fountain Valley, CA 92708, Tel: 714-545-5560, TELEX: 678-459, FAX: 714-545-6093; FSC No.: 58774; Empl.: 18; *Sls. Mgr.:* Gordon R. Calvert; *Dist. Mgr.:* Sheila A. Sherman .... **B•1176-1177**

Local Sales Offices & Reps

AZ Scottsdale, Advent Comp. Corp. 602-481-0044
CA Cupertino, F&F Assocs. 408-446-2349
FL Melbourne, Jerry Williams Inc. 407-259-7700
IL Elmhurst, Utronix Sls., Inc. 312-834-1100
IL Elmhurst, VTRONIX Sls. Inc. 312-834-1100
IN Kokomo, (SAI)Schillinger Assoc. Inc. .. 317-455-2708
IN Kokomo, Schillinger Assocs., Inc. 219-282-4570
KS Parker, S. W. Wollard Co. 913-898-6552
KS Parker, S.W. Wollard Co. 913-898-6552
MI Grosse Pointe Park, Greiner Assoc. Inc. 313-499-0188
NY Bayshore, Richard McGrath Inc. 516-968-8448
NY Jericho, Metro Tech. Sls., Inc. 516-935-3330
NY Massapequa, Richard McGrath, Inc. 516-789-0400
TN Nashville, INSUL-REPS Inc. 615-383-0524
WA Seattle, Repwest 206-283-8351

WARREN COMMUNICATIONS, See Fiskars Electronics Corporation

WARREN G-V, UNIT OF SIGNAL CO., 1 Apollo Dr., Whippany, NJ 07981, Tel: 201-386-1200, FAX: 201-386-9331; FSC No.: 93929; Empl.: 200; *Sls. Mgr.:* William Vandertulip

WARREN-KNIGHT INSTRUMENT CO., Warren Industries, Inc., 2045 Bennett Rd., Philadelphia, PA 19116, Tel: 215-464-9300; Empl.: 50; *Sls. Mgr.:* Richard M. Marron

WASATCH HIGH VOLTAGE, P.O. Box 15457, Salt Lake City, UT 84115, Tel: 801-265-9561; Empl.: 75; *Sls. Mgr.:* Gary I. Tobian

WATERS MANUFACTURING, INC. | Talley Industries

FAX: 508-358-5649

WATERS MANUFACTURING, INC., Talley Industries, Longfellow Ctr., Wayland, MA 01778, Tel: 508-358-2777, TELEX: 948441; FSC No.: ;Multiple; Empl.: 125; *Sls. Mgr.:* James Dyne ..... **A•2152-2153**

Local Sales Offices & Reps

AZ Sun City, Hannah Hill 602-933-4623
CA Hayward, Liaisen, Inc. 415-783-1131
CA Lomita, Techrep 213-539-9070
CO Broomfield, Hannah Hill 303-460-0602
CT Bloomfield, Sir Assocs. 203-243-9343
FL Melbourne, R-Rep 305-725-6993
FL Pompano Beach, R-Rep Co. 305-725-6993
IL La Grange Park, Bierhaus Sls 312-354-5100
MA Westford, Sir Assocs. 617-692-2500
MO Hazelwood, Acorn Elctrns. 314-731-2002
NJ Union, S. Simberkoff Assocs. 201-687-6363
NY Le Roy, SSAI 716-768-7213
OH Dayton, INH Comp. Sls. 513-434-8808
TX Dallas, Allied Comps. 214-238-0408
WI Milwaukee, Bierhaus Sls. 414-963-0318
Can Rexdale, Ont., Myelco, Inc. 416-674-1636

Local Distributors

CA Lomita, TecRep Comps. 213-539-9070
TX Dallas, Allied Comps. 214-238-0408

WATKINS-JOHNSON CO., 3333 Hillview Ave., Palo Alto, CA 94304, Tel: 415-493-4141, TELEX: 34-8415, TWX: 910-373-1253; FSC No.: 14482; Empl.: 3000

WAVELINE, Box 718, W. Caldwell, NJ 07006, Tel: 201-226-9100, TWX: 710-734-4324; FSC No.: 00443; Empl.: 95; *Sls. Mgr.:* D. Morsillo

WAVETEK, (Western Area Sales Office), 9045 Balboa Avenue, San Diego, CA 92123, Tel: 619-565-9234

WAVETEK, (Central Area Sales Office), 5808 Churchman Bypass, Indianapolis, IN 46203, Tel: 317-782-4619

WAVETEK, Northeast Area Sales Office, One Executive Blvd., Ste. 206, Suffern, NY 10901, Tel: 914-357-5544

WAVETEK, Southeast Area Sales Office, 2085 U.S. 19 North, Ste. 102, Clearwater, FL 34623, Tel: 813-797-1792

WAVETEK DATRON, See Datron Instruments (or call area sales offices)

WAVETEK MICROWAVE, INC., (Formerly Pacific Measurement, Inc.), 488 Tasman Dr., Sunnyvale, CA 94089, Tel: 408-734-5780, FAX: 408-747-1265

For sales offices and representatives, see Wavetek San Diego, Inc.

WAVETEK RF PRODUCTS, INC., (Formerly Wavetek Indiana, Inc.), 5808 Churchman By-Pass, Indianapolis, IN 46203, Tel: 317-787-3332, FAX: 317-788-5999

For sales offices and representatives, see Wavetek San Diego, Inc.

WAVETEK

FAX: 619-565-9558

WAVETEK SAN DIEGO, INC., 9045 Balboa Avenue, San Diego, CA 92123, Tel: 619-279-2200 ..... **D•1373**

Local Sales Offices & Reps

AL Huntsville, Southern Mktg. Assocs. 205-534-6020
AZ Phoenix, Tech. Mktg. Specialists 602-582-4800
CA Costa Mesa, Ward/Davis Assocs. 714-556-0956
CA Redondo Bch., Ward/Davis Assocs. .. 213-643-6977
CA San Diego, Ward/Davis Assocs. 619-292-1000
CA Santa Clara, Ward/Davis Assocs. 408-245-3700
CO Denver, Tech. Mktg. Specialists 303-691-5620
CT Wallingford, Pat Jenks Assocs. 203-265-9939
FL Longwood, Southern Mktg. Assocs. 407-682-7317
GA Marietta, Southern Mktg. Assocs. 404-565-0603
IL Arlington Heights, Dytec/Midwest, Inc.. 312-255-3200
IN Indianapolis, Dytec/Midwest, Inc. 317-297-5988
KS Lenexa, Dytec/South, Inc. 913-888-0215
MD Rockville, Creative Mktg. Assocs. 301-251-4100
MA Beverly, Pat Jenks Assocs. 508-921-4600
MI Madison Hgts., WKM Assocs. Inc. 313-588-2300
MN Edina, Dytec Instrs., Inc. 612-831-7169
MO Maryland Hgts., Dytec/South, Inc. 314-739-0665
NM Albuquerque, Tech. Mktg. Specialists .. 505-889-4595
NY Great Neck, RTI 516-829-3770
NY Liverpool, NTS Assocs., Inc. 315-451-1091
NC Greensboro, Southern Mktg. Assocs. .. 919-854-5588
OH Independence, WKM Assocs., Inc. 216-524-5930
OK Tulsa, Data Mktg. 918-494-2711
OR Beaverton, Northwest Test & Meas. 503-645-9000
PA Southampton, Eastern Instrmn. of PA.. 215-355-7700
TX Dallas, Data Mktg. Assocs. 214-661-0300
TX Houston, Data Mktg. Assocs. 713-954-5020
WA Redmond, Northwest Test & Meas. 206-881-8857
WI Brookfield, Dytec/Midwest, Inc. 414-792-0320
Can Montreal, Que., Interfax Sys., Inc. 514-336-0392

WAYNE TRANSFORMERS CO., INC., A Marine Electric Systems Co., 50 Carol St., P.O. Box 1135, Clifton, NJ 07014-1135, Tel: 201-614-1100, TELEX: 139039; *Sls. Mgr.:* J. DeMauro ..... **A•2512**

WEBER, Inmark Corporation-Importer, 4 Byington Place, Norwalk, CT 06850, Tel: 203-866-8474, FAX: 1-203-866-0918

WECO®

FAX: 518-298-5938

WECO ELECTRICAL CONNECTORS, INC., Trimex Bldg., Rte. 11, Mooers, NY 12958, Tel: 518-298-4810; FSC No.: 5935, 5963, 5940; Empl.: 52; *Sls. Mgr.:* David Asseraf; *Dist. Mgr.:* David Asseraf ..... **C•1563-1574**

Local Sales Offices & Reps

AL Huntsville, Twentieth Century Mktg. Inc. 205-533-9281
AZ Scottsdale, Haas & Assoc. Inc. 602-998-7195
AR Mabelville, Erickson Sls. Inc. 501-455-0618
CA Newport Bch., SPA Inc. 714-863-1193
CA San Jose, Landia Sls. Grp. 408-280-5695
CA Vista, SPA Inc. 619-530-0209
CO Littleton, Chinook Tech Sls. 303-933-9007
DE Belair, LHR Assocs., Inc. 609-829-6861
FL Deerfield Beach, Florida Comp. Sls., Inc. 305-429-1758
FL Tampa, Florida Comp. Sls. Inc. 813-960-7044
GA Norcross, Twentieth Century Mktg. Inc. 404-446-1999
IL Palatine, Key Entprs. Inc. 312-991-2144
IN Indianapolis, MEI (Mktg. Engrs.) 317-872-5665
IA Coralville, Engrg. Prods. Assocs. 319-354-5344
KS Shawnee Mission, Thomas L. Dowell & Assoc. 913-599-1100
KY Louisville, M E I 502-267-7093
LA Chalmette, Erickson Sls. Inc. 314-849-4234
ME Kittery, Olsen Tech Sls. Inc. 207-439-0280
MD Belair, LHR Assocs. Inc. 301-877-3405
MA Scituate, Olsen Tech Sls. Inc. 617-878-9386
MA Scituate, Olsen Tech. Sls. Inc. 617-545-5101
MN Edina, Engrg. Prods. Assocs. 612-835-9022
MO St. Louis, Thomas L. Dowell & Assocs. 314-849-4234
NJ Woodbridge, John Chirico Assocs. Inc. 201-855-9600
NY Buffalo, Upstate Engrg. Sls. 716-632-0011
NY Rochester, Upstate Engrg. Sls. 716-225-2383
NY Utica, Upstate Engrg. Sls. 315-797-6721
NC Cary, Twentieth Century Mktg. 919-481-3370
OH Cleveland, Marlow Assocs. 216-991-6500
OH Dayton, Marlow Assocs., Inc. 513-274-9666
OR Portland, SPS Elctrns. 503-297-6919
PA Harrisburg, Beil & Whitaker 717-564-6900
PA Pittsburg, Marlow Assocs., Inc. 412-343-5050
TN Knoxville, Twentieth Century Mktg. 615-966-2099
TX Dallas, Erickson Sls. Inc. 214-739-5833
TX Houston, Erickson Sls. Inc. 713-266-1604
TX Round Rock, Erickson Sls. Inc. 512-244-3068
UT Riverton, Chinook Tech Sls. 801-254-7166
VA Belair, LHR Assocs. Inc. 301-877-3405
WA Redmond, SPS Elctrns. 206-323-4140
WI Milwaukee, Key Entprs. Inc. 414-453-9462

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AL Mobile, Spectronics Inc. 205-344-0450
AZ Tempe, Control Design Supp. Inc. 602-829-7981
CA Anaheim, Control Design Supp. Inc. 213-802-1371, 714-821-1516
CA Anaheim, DECO Elctrns. Inc. 714-630-8252
CA Fountain Valley, Comp. Ctr. 714-979-0433
CA Fremont, Terminal Sls. Corp. 415-656-7722
CA Fullerton, I.S.I. Mktg. Co. 714-773-0411
CA Orange, Wed-Garde Comps. Grp. 714-953-1254
CA San Carlos, Control Design Supp. Inc. . 415-592-4806
CA San Diego, Sigma Elctrns. 619-565-2000
CA San Diego, Wes-Garde Comps. Grp. .. 619-264-6117
CA Van Nuys, Wes-Garde Comps. Grp. 213-873-4802
CT Middlefield, Control Design Supp. Inc.. 203-349-0200
CT Yalesville, Glynn Elctrns. 203-265-2498
FL Altamonte Springs, Control Design Supp. 305-788-3220,1-800-432-58
FL Bradenton, Specialty Dist. Co. Inc. 813-756-9571, 1-800-282-58
FL Davie, ARCO Dists. Inc. 305-473-2550, 305-940-3295
FL Ft. Lauderdale, Specialty Dist. Co. inc. . 305-561-2544
FL Jacksonville, Specialty Dist. Co. Inc. 904-356-8426
FL Lakeland, Specialty Dist. Co. Inc. 813-686-8193, 1-800-282-90
FL Largo, Electronic Precepts of FL Inc. .. 813-544-3636
FL Melbourne, Specialty Dist. Co. Inc. 305-254-5274
FL Pompano Bch., Control Design Supp. Inc. 305-782-1311
FL Tampa, Specialty Dist. Co. Inc. 813-870-3315, 1-800-282-78
GA Albany, Specialty Dist. Co. Inc. 912-435-1711, 1-800-633-40
GA Athens, Specialty Dist. Co. Inc. 404-548-1334, 1-800-443-55
GA Atlanta, Specialty Dist. Co. Inc. 404-458-6341, 1-800-392-98
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MN Minneapolis, Control Design Supp. Inc. 612-721-1628,1-800-328-82
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MO St. Louis, Franklin Elctrns. 314-993-5333
NH Manchester, Glynn Elctrns. 603-622-8131
NJ Kenilworth, Federated Purchaser Inc. 201-272-0505
NJ S. River, Kon-Tac Inc. 201-254-5100
NY Bohemia, Key Comps. Inc. 516-567-7500
NC Pineville, Control Design 704-588-4410
OH Akron, Aesco Elctrns. Inc. 216-762-8818
OH Canton, Aesco Elctrns., Inc. 216-621-5835
OH Cleveland, Aesco Elctrns., Inc. 1-800-362-0022
OH Columbus, Aesco Elctrns. Inc. 614-882-6762
OK Oklahoma City, RSC Elctrns. Inc. 405-631-7729
OR Portland, Dunn Elctrns. Inc. 503-285-0214
PA Malvern, Control Design Supp. Inc. 215-296-0150
PA Wilkes Barre, Wallco Inc. 717-823-6181
PA York, Elctrn. Comp. for Inds. 717-846-5334
TN Chattanooga, Specialty Dist. Co. Inc. .. 615-624-1040
TX Austin, Wofford Elctrns., Inc. 512-339-1131
TX Carrollton, Connec-Tek Inc. 214-245-0776
TX Dallas, Control Design .. 214-358-1441,512-448-1919
TX Dallas, Off The Shelf 214-247-0052
TX Houston, Wafford Elctrns., Inc. 713-849-3583
TX Richardson, RSC Elctrns., Inc. 214-783-4618
WA Kirkland, Dunn Elctrns. 206-821-3678
TX Richardson, Off The Shelf 214-238-0808
WI New Berlin, Control Design 414-784-1016, 1-800-242-43
WI New Berlin, Control Design Supp. Inc. 414-784-1016

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WECO ELECTRICAL CONNECTORS, INC., 16805 Hymus Blvd., Kirkland, Quebec, Canada H9H 3L4, Tel: 514-694-9136, FAX: 514-694-0956; FSC No.: 5935, 5963, 5940; Empl.: 52; *Sls. Mgr.:* Ramy Badawy; *Dist. Mgr.:* Ramy Badawy ..... **C•1563-1574**

WECO ELECTRICAL CONNECTORS, INC., 151 Carlingview Dr., Unit 5, Rexdale, Ontario, Canada M9W 5S4, Tel: 416-674-1084, TELEX: 06-989100 POS TOR, FAX: 416-675-0057 ..... **C•1563-1574**

Local Sales Offices & Reps

Can Calgary, Alta., Deskin Sls. 1-800-661-1935
Can Edmonton, Alta., Deskin Sls. 403-466-2106
Can Edmonton, Sask., Deskin Sls. 1-800-661-1935, 403-466-2106
Can Kirkland, Que, Weco Electrical Connectors 514-694-9136
Can Rexdale, N.B., Weco Electrical Connectors 416-674-1084
Can Rexdale, N.S., Weco Electrical Connectors 416-674-1084
Can Rexdale, N.W.T., Weco Electrical Connectors 416-674-1084
Can Rexdale, Nfld., Weco Electrical Connectors 416-674-1084
Can Rexdale, Ont., Weco Electrical Connectors 416-674-1084
Can Rexdale, P.E.I., Weco Electrical Connectors 416-674-1084
Can Rexdale, Yukon, Weco Electrical Connectors 416-674-1084
Can Transconia, B.C., Deskin Sls. 1-800-661-1935
Can Vancouver, B.C., Deskin Sls. 1-800-663-5969, 604-324-8343

Local Distributors

Can Calgary, Alta., Deskin Sls. 403-466-2106
Can Concord, Ont., Zierick Canada Corp. .. 416-669-1429
Can Dartmouth, Nova Scotia, Arcom Elctrns. 902-464-1600
Can Drummondville, Que., Marnel Intl. 819-478-3128
Can Edmonton, Alta., Deskin Sls. 403-466-2106
Can Islington, Ont., D. T. Shaw Ltd. 416-231-3494
Can Kanata, Ont., Prelco Ltd. 613-592-3636
Can Longueuil, Que., Lumen Inc. 514-679-3460
Can Mississauga, Ont., Prelco Ltd. 416-678-0401, 1-800-387-38
Can Mississauga, Ont., Sayal Elctrns. 416-238-8440
Can Montreal , Que, Versatech Elctrns. Inc. 541-481-0196
Can Montreal, Que., D. T. Shaw Ltd. 514-332-1163
Can Montreal, Que., Prelco Ltd. 514-389-8051
Can Nepean, Ont., Carsten Electrns. Ltd. ... 613-726-9250
Can Oakville, Ont., Cantwell & Co. 416-842-8470
Can Ottawa, Ont., Cantwell Cullen & Co. Inc. 613-744-4516
Can Quebec, Que, Pro Technique J. M. Emond 418-529-5774
Can Quebec, Que., Crobel Llee Electronique 418-687-1171
Can Scarborough, Ont., Carsten Elctrns. Ltd. 416-495-9999,1-800-268-34
Can Scarborough, Ont., Sayal Elctrns. 416-494-8999
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Can St Laurent, Que., Zierick 514-331-7460
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Can Vancouver, B.C., Deskin Sls. 604-324-8343
Can Ville Laval, Que., Montcalm Elctrns. ... 514-663-3102
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WEED INSTRUMENT CO., INC., 707 Jeffrey Way, P.O. Box 300, Round Rock, TX 78664-0300, Tel: 512-255-7043, TELEX: 776492; Empl.: 110; *Sls. Mgr.:* Hal Hearon

WEICO WIRE & CABLE, 161 Rodeo Dr., Edgewood, NY 11716, Tel: 516-254-2970, FAX: 516-254-2099; FSC No.: 7R617; *Sls. Mgr.:* Theodore Weill ..... **C•1926-1959**

WEIDMULLER, INC., 821 Southlake Blvd., Richmond, VA 23236, Tel: 804-794-2877, TELEX: 828376, FAX: 804-794-0252; Empl.: 66; *Sls. Mgr.:* Peter Anest ... **C•1576-1579**

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TX Jack Guinn 713-437-2011
TX Jeff Crockett 713-870-1515
TX TRJ Mktg. 214-241-7822
VA George Kemper 703-491-6333

WEIR ELECTRONICS, INC., Weir Elctrns., Ltd., 418 3rd St., Annapolis, MD 21403, Tel: 301-268-0122, FAX: 301-268-7909; Empl.: 2; *Sls. Mgr.:* Barbara Bunting

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NH Salem, QEM Mktg. & Sls. 603-893-0009
PA Horsham, Nexus Technlg. Sls., Inc. ... 215-675-9600
PA Montgomeryville, Eastern Sci. Mktg. ... 215-368-4570
TX Richardson, Jim Gray Assocs. 214-699-9976

WEIR ELCTRNS. LTD., Durban Rd., Bognor Regis, West Sussex, ENG PO 22 9RW, Tel: 0243-865991, TELEX: 86543, FAX: 0243-868613; Empl.: 500; *Sls. Mgr.:* Peter Cole (Exp.)

WELCH ALLYN, INC., Industrial Products Division, Jordan Rd., Skaneateles Falls, NY 13153-0187, Tel: 315-685-8945, TELEX: 325435, FAX: 315-685-3172; *Sls. Mgr.:* Richard Kraetz; *Dist. Mgr.:* Tim McGilloway

WELCON/WELLS, 1701 S. Main St., South Bend, IN 46613, Tel: 219-287-5941, FAX: 219-281-0356; *Dist. Mgr.:* Mike Myers

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WELLS ELECTRONICS, 1701 S. Main St., South Bend, IN 46613, Tel: 219-287-5941, TELEX: 4937960, FAX: 219-287-0356; FSC No.: 219-287-0356; Empl.: 200; *Sls. Mgr.:* Hap Taylor

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WESCO ELECTRICAL CO., 201 Munson St., Greenfield, MA 01301, Tel: 413-774-4358, FAX: 413-774-4562; FSC No.: 12673; Empl.: 150; *Sls. Mgr.:* James R. DeSanty ..... **A•1186-1193**

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IN	Indianapolis, John H. Weaver Co.	317-257-7661
MD	Severna Park, Jenco Sls.	301-544-8652
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MI	St. Clair Shores, DEM Sls., Inc.	313-777-1750
MN	Minneapolis, Furber Sls. Co.	612-881-3620
NY	Fayetteville, Foster & Wager, Inc.	315-637-5427
NY	Port Washington, Ashtec, Inc.	516-767-0336
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TN	McMinnville, B & D Mktg.	615-473-7155
TX	Irving, Kite Elctrn. Sls. Co., Inc.	214-986-0321
Can	St. Laurent, Que., Techrep	514-337-6046

WESCORP ANTISTATIC PRODUCTS, 144 S. Whisman Rd., Mountain View, CA 94041, Tel: 415-969-7717, TELEX: 345507, FAX: 415-969-6130; Empl.: 15; *Sls. Mgr.:* Phyllis Munder

Distributor

WES-GARDE COMPONENTS GROUP, INC., 190 Elliott St., Hartford, CT 06114, Tel: 203-525-6907 ..... **B•1846**

WESTAMP, 1542 15th St., Santa Monica, CA 90404, Tel: 213-393-0401, TELEX: 3720078; FSC No.: 12745; Empl.: 100; *Sls. Mgr.:* Michael Mula

WESTBERG MANUFACTURING INC. (WESTACH), 3400 Westach Way, Sonoma, CA 95476, Tel: 707-938-2121; Empl.: 20; *Sls. Mgr.:* R. R. Westberg

WEST-CAP ARIZONA, Sub. of SFE Technologies, 2201 East Elvira Road, Tucson, AZ 85706, Tel: 602-294-2646, TWX: 910-952-1153, ESYLNK: 62901470, FAX: 602-294-8986; *Sls. Mgr.:* Gordon Van Camp; *Dist. Mgr.:* Gordon Van Camp

WEST COAST ELEC. MFG., 14045 Garfield Ave, Paramount, CA 90723, Tel: 213-633-1010, FAX: 213-633-1018; FSC No.: 81823; Empl.: 25; *Sls. Mgr.:* W. E. Seal

WESTCON, 959 Cheney Ave., Marion, OH 43302, Tel: 614-382-5771, TELEX: 3775688; Empl.: 50; *Sls. Mgr.:* James Call

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FAX: 408-395-1518

WESTCOR CORPORATION, 485-100 Alberto Way, Los Gatos, CA 95032, Tel: 408-395-7050, TWX: 910-240-2108, ESYLNK: 62334410; *Sls. Mgr.:* Nancy Pepper ..... **D•2134-2139**

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IL	Schaumburg, Engrg. Prods. Assocs.	312-882-7640
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IN	Indiannapolis, Engrg. Prods. Assocs.	317-352-0605
IA	Coralville, Engrg. Prods. Assocs.	319-354-5344
MA	Chelmsford, Interstate Sls. Assocs.	617-256-2287
MN	Minneapolis, Engrg. Prods. Assocs.	612-835-9022
OR	Beaverton, Core II Mktg.	503-641-0877
TX	Austin, Allied Comps., Inc.	512-331-4494
TX	Dallas, Allied Comps., Inc.	214-238-0408
TX	Hurst, Allied Comps., Inc.	817-589-0456
WA	Spokane, Core II Mktg.	509-922-2971
Can	W. Vancouver, BC, Coda Resch.	604-922-3651

WESTERN DIGITAL CORP., 2445 McCabe Way, Irvine, CA 92714, Tel: 714-863-0102, TWX: 910-595-1139; Empl.: 6500; *Sls. Mgr.:* Dirk Eastman, VP; *Dist. Mgr.:* William Smith

WESTERN ELECTRO-MECHANICAL CO., INC., 300 Broadway, Oakland, CA 94607, Tel: 415-452-1936; Empl.: 9; *Sls. Mgr.:* W. J. Foster

Western Electronic Components Corp.

FAX: 805-482-8675

WESTERN ELCTRN. COMPS. CORP., 1250-A Avenida Acaso, Camarillo, CA 93010, Tel: 805-482-8002, TELEX: 401076; Empl.: 15; *Sls. Mgr.:* Russ Geary ..... **B•1922-1925**

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CA	Santa Clara, Integrated Tech. Sls.	408-727-3406
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Can	Burnaby, Tech-Rep Elctrns. Ltd.	604-432-1788
Can	Mississauga, Tech-Rep Elctrns. LTD	416-890-2903
Can	Nepean, Tech-Rep Elctrns. Ltd.	613-225-9186
Can	St. Laurent, Tech-Rep Elctrns. Ltd.	514-337-6046

WESTERN ELECTRONIC PRODUCTS CO., 915-G Calle Amanecer, San Clemente, CA 92672, Tel: 714-492-4677, FAX: 714-492-5952; Empl.: 6; *Sls. Mgr.:* Tony English

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FAX: 714-855-0895

WESTERN GRAPHTEC, 11 Vanderbilt, Irvine, CA 92718-2067, Tel: 714-770-6010, 800-854-8385; Empl.: 72 ..... **D•1443**

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AZ	Chandler, Vic Myers Assocs.	602-241-9324
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MA	Andover	508-470-1806
MA	Burlington, Tritek	617-272-4550
MA	Hopkinton, Eastern Sys.	508-435-2151
MI	Milford, T.M.S.	313-360-1514
MN	Wayzata, Comtel Midwest	612-476-1551
MO	St. Louis, Comtel Midwest	314-991-5363
MO	St. Peters	314-279-3915
NJ	Cherry Hill, Sci. Rep.	609-662-5222
NM	Albuquerque, Vic Myers Assocs.	505-884-6878
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NY	Fayetteville, Martin P. Andrews	513-637-3144
NY	Kings Pk., K.L.S.	516-724-3155
NC	Cary, W. A. Brown	919-460-1120
OH	Kettering, T.M.S.	513-429-1142
OH	Westlake, T.M.S.	216-327-3527
OK	Tulsa, J. Wisdom & Assocs.	918-665-8899
PA	Mars, T.M.S.	412-776-1666
TX	Richardson	214-238-5575
TX	Richardson, J. Wisdom & Assocs.	214-470-9093
TX	Round Rock, J. Wisdom & Assocs.	512-255-1167
TX	Spring, J. Wisdom & Assocs.	713-376-8678
UT	Salt Lake City, Vic Myers	801-581-1760
VA	Hampton, Sel-Tronics	804-827-6308
WA	Bellevue, Western Instrs.	206-881-5110
WI	New Berlin, Comtel Midwest	414-544-6042

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CA	Pleasanton, SECCO Sls.	415-484-1030
CA	Redwood City, Marchi Assocs.	415-364-3411
CA	Ripon, Adcon Assocs.	209-599-3993
FL	Deerfield, Serco Inc.	312-945-8180
MD	Lanham, Sel Tronics	301-731-0961
MA	N. Billerica, Electra Test	617-667-8541
MI	Southfield, Comtel Instrs.	313-358-2505
NJ	Clarksburg, Accutest Instrs.	800-524-0747
NY	Great Neck, Instr. Mart	516-487-7430
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OH	Cleveland, Comtel	216-442-8080
OH	Dayton, Comtel	513-426-5310
OH	Hilliard, Comtel	614-876-8305
PA	Philadelphia, Instrmn. Specialists	215-742-0898
PA	Pittsburgh, Comtel	412-922-5720
TN	Knoxville, Clark Tech.	615-691-7485
TX	Dallas, Dallas Meter-Tek	214-349-6044
WA	Bellevue, Western Instrs.	206-881-5110

WESTERN MULTIPLEX CORP., 1320 Bayport Avenue, San Carlos, CA 94070, Tel: 415-592-8832, TELEX: 295114 VIA RCA, FAX: 415-595-2280; FSC No.: 94-2620670; Empl.: 33; *Sls. Mgr.:* Mike Gresham

WESTERN RESERVE ELECTRONICS, 2150 Highland Rd., Twinsburg, OH 44087, Tel: 216-425-4951, TELEX: 511178 WRE TWSB, FAX: 216-425-4956; Empl.: 100; *Sls. Mgr.:* Robert Rhodes

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WEST INSTRUMENT, A Mark IV Company, 3860 N. River Rd., Schiller Park, IL 60176, Tel: 312-678-6400, FAX: 312-678-6403; Empl.: 150; *Sls. Mgr.:* W. J. Bell, Jr.; *Dist. Mgr.:* W. J. Bell, Jr.

WESTON

WESTON INSTRUMENTS, Electrical Instrument Service, Inc., 25 Dock St., Mt. Vernon, NY 10550, Tel: 914-699-9717; FSC No.: 32590; Empl.: 35; *Sls. Mgr.:* Gerald D. Frank; *Dist. Mgr.:* Gerald D. Frank ..... **D•1374-1375**

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AL	Mobile, Brownell Instrs. & Controls Co.	205-479-8581
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CA	Palo Alto, Metermaster/Palo Alto	415-960-8500
CA	San Diego, Crompton Metermaster	619-560-4841
CA	Sunnyvale, EIL Instrs., Inc.	408-245-4320
CA	Yorba Linda, Crompton Metermaster	714-921-2101
CO	Aurora, R & R Instrmn.	303-340-8728
CO	Denver, EIL Instrs., Inc.	303-534-4160
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FL	Miami, Brownell Instrs. & Controls Co.	305-884-3197
FL	Orlando, Brownell Instrs. & Controls Co.	407-843-6776
FL	Palm Bay, EIL Instrs., Inc.	407-725-8300
GA	Atlanta, Brownell Instrs. & Controls Co.	404-762-5181
GA	Norcross, Metermaster	404-446-0166
IL	Bridgeview, EIL Instrs.	312-430-2292
IL	Countryside, Pacific Indicator	312-352-3500
IL	Glendale Heights, Crompton Metermaster	312-351-4644
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KS	Overland Pk., Brooks Elctrns., Inc.	913-648-3131
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LA	New Orleans, Indl. Instr. Works	504-733-8355
MD	Sparks, EIL Instrs., Inc.	301-771-4800
MA	Burlington, EIL Instrs., Inc.	617-272-9450
MA	Southbridge, Crompton Metermaster	508-765-1676
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VA Springfield, EIL Instrs., Inc. 703-569-2611
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WI Milwaukee, E-M Instrs. 414-272-7799
Can Mississauga, Ont., EIL Instrs., Inc. 416-624-6660

Westrex Products

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WESTREX PRODUCTS, 25 Denby Rd., Boston, MA 02134, Tel: 617-254-1200, TELEX: 951589; Empl.: 200; *Sls. Mgr.:* Blaine Wotring ..... **D•1108, 1116**

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Can Markham, Ont., Tech. Logistics Support 416-479-1911

WESTRONICS INC. OF TEXAS, 2441 Northeast Pkwy, Box 961003, Ft. Worth, TX 76161, Tel: 817-625-2311, FAX: 817-625-1068; Empl.: 180; *Sls. Mgr.:* Paul Shultz

WHEELOCK, INC., 273 Branchport Ave., Long Branch, NJ 07740, Tel: 201-222-6880, TWX: 710-722-6510, FAX: 201-222-8707; Empl.: 200; *Sls. Mgr.:* William L. Goldstein, Sls./Mktg. VP

WHITMOR WIRE & CABLE, 27737 Ave. Hopkins, Valencia, CA 91355, Tel: 805-257-2400, FAX: 805-257-2495; FSC No.: 15851; Empl.: 29; *Sls. Mgr.:* Mark Lee; *Dist. Mgr.:* Mark Lee

WHITSO, 9326 Byron St., Schiller Pk., IL 60176, Tel: 312-678-5200; Empl.: 170

WHITTAKER CORP., Electronic Resources Div., 1955 N. Surveyor Ave., Simi Valley, CA 93063, Tel: 805-584-4100, TWX: 910-498-2751, FAX: 805-584-9157; FSC No.: 72152; Empl.: 200

WHITTAKER CORP., Providence Chemicals Div., King Philip Rd., P.O. Box 16069, E. Providence, RI 02916, Tel: 401-434-1770, TELEX: 92-7652, FAX: 401-434-8090; Empl.: 25

WHITTAKER-YARDNEY POWER SYSTEMS, Whittaker-Tech. Prods., Inc., 82 Mechanic St, Pawcatuck, CT 02891, Tel: 203-599-1100, TELEX: 6813114, TWX: 710-470-0260; FSC No.: 87362; Empl.: 250; *Sls. Mgr.:* Rene DuBois

WIDE BAND ENGINEERING CO., INC., Box 21652, Phoenix, AZ 85036, Tel: 602-254-1570; Empl.: 10

WIDE RANGE ELCTRNS. CORP., 140 Sun Valley Cir., St. Louis, MO 63026, Tel: 314-343-9191, TELEX: 44-2560; Empl.: 11; *Sls. Mgr.:* Donald Toone

WILBRECHT ELECTRONICS, 346 Chester St., St. Paul, MN 55107, Tel: 612-222-2791, FAX: 612-222-7639; Empl.: 200; *Sls. Mgr.:* Laurie Wilbrecht

WILCO

FAX: 317-293-9462

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FL Hollywood, Askland Elctrn. Comps. ... 305-987-1074
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IN Carmel, Current Elctrn. Mktg. 317-575-9943
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MI Warren, DEM Elctrn. Sls. 313-575-9444
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OH Cincinnati, JMK Elctrns. 513-271-3860
OH Cleveland, JMK Elctrns. 216-886-7100

Local Distributors

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NJ E. Brunswick, Brothers Elctrns., Inc. ... 201-238-2200

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WILCOXON RESEARCH, 2096 Gaither Rd., Rockville, MD 20850, Tel: 301-330-8811, TELEX: 898-342; Empl.: 50; *Sls. Mgr.:* Fred Wilcoxon ..... **B•2000**

WILKINSON, P.O. Box 4558, Westlake Village, CA 91359, Tel: 818-889-0050, 800-822-4653, TELEX: 698213, FAX: 818-889-3810; Empl.: 44; *Sls. Mgr.:* R. Cook; *Dist. Mgr.:* R. Cook

WILMANCO, 19529 Business Center Drive, Northridge, CA 91324, Tel: 818-993-1662/1663, TWX: 9103807912 WILMANCOUWAV, FAX: 818-993-5438; FSC No.: 1Y521; Empl.: 12; *Sls. Mgr.:* Christian Noiroux

WILMAR ELECTRONICS, INC., 2430 Amsler St, Torrance, CA 90505, Tel: 213-326-6668, TELEX: 182417, FAX: 213-326-9147; FSC No.: 25248; Empl.: 25; *Sls. Mgr.:* Zev Heifetz

WILMORE ELECTRONICS CO., Box 1329, Hillsborough, NC 27278, Tel: 919-732-9351, TELEX: 292617; Empl.: 48; *Sls. Mgr.:* J. L. Harris ..... **D•2140-2143, 2236-2237**

WILSON, H. F., ENGINEERING CO., 475 Taft Ave., Glen Ellyn, IL 60137, Tel: 312-469-8473, TELEX: 72-1438; Empl.: 21; *Sls. Mgr.:* H. Wilson; *Dist. Mgr.:* William Henry

WILSON, H. M., CO., 11501 Chimney Rock Rd., Houston, TX 77035, Tel: 713-729-1183; Empl.: 3; *Sls. Mgr.:* H. M. Wilson

WILSON ELECTRONICS, See Regency Land Mobile, Inc.

WILTRON, 490 Jarvis Dr., Morgan Hill, CA 95037-2809, Tel: 408-778-2000, TELEX: 285227 WILTRON MH, FAX: 408-778-0239; FSC No.: 20944; Empl.: 800; *Sls. Mgr.:* W. Baxter

WINSYSTEMS, INC., P.O. Box 121361, Arlington, TX 76012, Tel: 817-274-7553, FAX: 817-548-1358; FSC No.: 1AU87

WINTEK CORP., 1801 South St., Lafayette, IN 47904-2993, Tel: 317-742-8428, 800-742-6809, TELEX: 70-9079, FAX: 317-448-4823; Empl.: 16 ..... **D•1124-1125**

WIREBENDERS, INC., 2440 W. Mission Ln., Ste. 9,10, Phoenix, AZ 85021, Tel: 602-861-1856, FAX: 602-870-9242; FSC No.: 5950;FSCS/CAGE 1DA26; Empl.: 18; *Sls. Mgr.:* Leo Middleton

THE WIREMOLD COMPANY, 60 Woodlawn Street, W. Hartford, CT 06110, Tel: 203-233-6251, FAX: 203-323-2062; Empl.: 900; *Sls. Mgr.:* F. D. Casteel

WIRE-PRO, INC., 23 Front Street, Salem, NJ 08079, Tel: 609-935-7601, 609-935-7651, TWX: 510-680-4750, FAX: 609-935-0102; Empl.: 225; *Sls. Mgr.:* Philip Negrin, Mktg. Mgr.; *Dist. Mgr.:* Philip Negrin

WIRING ANALYZERS, INC., 9850 Owensmouth Ave., P.O. Box 4535, Chatsworth, CA 91313, Tel: 818-709-4500, 800-221-5979 (excl. CA & AK); Empl.: 15; *Sls. Mgr.:* Norman Wartell

WON TRONICS, Apollo Magnetics Corp., 2720 W. Beverly Blvd., Los Angeles, CA 90057, Tel: 213-381-2500, TWX: 910-321-4348; *Sls. Mgr.:* Michael Ronzon

WORLDNET MARKETING INC., 3187 F Airway Ave., Costa Mesa, CA 92626, Tel: 714-545-7118, TELEX: 3781824, FAX: 714-540-9138; Empl.: 7; *Sls. Mgr.:* Frank Buday; *Dist. Mgr.:* Frank Buday

WORLD PRODUCTS INC., 19654 8th St. East, Sonoma, CA 95476, Tel: 707-996-5201, TELEX: Worldpro snom 171715, FAX: 707-996-3380; FSC No.: 410966309; Empl.: 445; *Sls. Mgr.:* Mark Beynon; *Dist. Mgr.:* Mark Beynon ..... **A•1194-1195, 2212-2213; B•1926-1927**

Local Sales Offices & Reps

AL Huntsville, Technlg. Mktg. Assoc. 205-883-7893
AZ Scottsdale, American Mktg. Inc. 602-948-2778
CA Agoura Hills, Westpower 818-706-2550
CA Mountain View, Straube Assocs., Inc. 415-969-6060
CO West Minster, Straube Assocs. Mountain States 303-426-0890
FL Orlando, Technlg. Mktg. Assocs. 407-857-3760
GA Norcross, Technlg. Mktg. Assoc. 404-446-3565
IL Arlington, KMA Sls. Co. 312-398-5300
IN Indianapolis, Frank J. Campisano Co. 317-253-7651
IA Marion, Associated Elctrn. Mktg. Inc. .. 319-377-1129
KS Lenexa, Associated Elctrn. Mktg. Inc. .. 913-888-0022
MA Lexington, Jodan Technlg. 617-863-8898
MI Grosse Pointe Park, Greiner Assocs. Inc. 313-499-0188
MN Minneapolis, Tecteam Sls. Inc. 612-854-6616
MO St. Louis, Assocd. Elctrn. Mktg. Inc. 314-731-2240
NJ Fords, Marlin Data Corp. 201-738-7200
NM Albuquerque, Syntech 505-266-7951
NY Rochester, Apex Assocs. 716-272-7040
NC Raleigh, Technlg. Mktg. Assoc. 919-850-0878
OH Cincinnati, Frank Campisano Co. 513-574-7111
OR Portland, Caruso & Co. 503-620-0375
PA Coraopolis, Frank J. Campisano Co. .. 412-264-5151
PA Montgomeryville, Quick Response Tech. Sls. 215-362-9225
TX Houston, R-Squared Elctrns., Inc. 713-820-3210
UT Salt Lake City, Straube Assocs.,Mtn. States Inc. 801-263-2640
WA Bellevue, Caruso & Co. 206-455-8811
WI Milwaukee, KMA Sls. Co. 414-259-1771

Local Distributors

FL Melbourne, Pridmore 305-727-2491
IL Lisle, Comps., Inc. 312-852-7707
MA Norwood, Emtel 617-769-9500
NH Salem, Tech-Mark Corp. 603-893-8380
PA McKean, Advacom 814-476-7774
TX Dallas, Omni Pro 214-233-0500
WI Milwaukee, Comps., Inc. 414-529-4106

WORLD PRODUCTS INC., Systems Devices Grp., 19654 8th St. E., Sonoma 95476, Tel: 707-996-5201, FAX: 707-996-3380; Empl.: 50 ..... **B•1124-1125**

'WORLD' TEST SYSTEMS, INC., P. O. Drawer 1428, Waynesboro, VA 22980, Tel: 703-949-6753, FAX: 703-943-3826; *Sls. Mgr.:* Buford H. Baber

WOVEN ELECTRONICS, Woven Electronics Corporation, Old Stage Road, Simpsonville, SC 29681, Tel: 803-963-5131, TWX: 810-963-5131, FAX: 803-963-1761; Empl.: 400; *Sls. Mgr.:* Peggy Burnett

WYLE LABS, See Electronic Enclosures

XCEL CORPORATION, See Digitran and Computron Display Sys. Divs.

XCP, INC., 8 W. Main St, Dryden, NY 13053, Tel: 607-844-9143; *Sls. Mgr.:* Diane Rademacher

XEDAR CORP., 2500 Central Ave, Boulder, CO 80301, Tel: 303-443-6441, FAX: 303-443-6444; *Sls. Mgr.:* Andy Zeidler

XELTEK, 473 Sapena Ct., Unit 24, Santa Clara, CA 95054, Tel: 408-727-6995, TELEX: 408-727-6996; *Sls. Mgr.:* Jung Mi Lee; *Dist. Mgr.:* Youngho Chung

XENON CORP., 20 Commerce Way, Woburn, MA 01801, Tel: 617-938-3594, TELEX: 928204; Empl.: 45; *Sls. Mgr.:* Louis R. Panico

XENOTRONIX INC., 26074 Ave., Hall No. 10, Valencia, CA 91355, Tel: 805-257-4793, FAX: 805-257-1093; *Sls. Mgr.:* Coleen Miller

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The Heart of Your System

FAX: 619-727-8926

XENTEK, INC., 760 Shadowridge Drive, Vista, CA 92083, Tel: 619-727-0940, TWX: 910-322-1155; FSC No.: 52360; Empl.: 300 ..... **D•2144-2149**

Local Sales Offices & Reps

AL	Huntsville, The Novus Grp.	205-534-0044
AZ	Fountain Hills, Halbar Assocs.	602-837-2464
CA	Glendale, Halbar Assocs.	818-246-8263
CA	San Jose, Richards Assocs.	408-452-8171
FL	Orlando, Currie Peak & Frazier	305-855-0843
GA	Lilburn, The Novus Grp.	404-381-1015
IL	Itasca, LTD Technlgs., Inc.	312-773-2900
IN	Carmel, Berndt Assocs.	317-844-0114
MD	Hunt Valley, Phoenix Sls.	301-628-2066
MA	Southboro, Sullivan Tech.Sls.	508-485-2215
MI	Jenison, Young Technlgs.	616-457-2616
MI	Southfield, Fred Gehrke	313-559-5363

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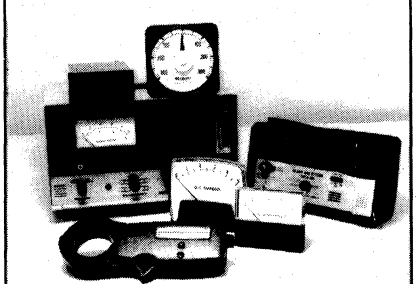

1810 Grant Avenue
Philadelphia, PA 19115
215-673-5600
FAX: 215-673-5609

800-343-1199

THE ULTIMATE TECHNICAL SOURCE

MN	Minneapolis, Berndt Assocs.	612-546-2021
MO	Ellisville, Gateway Tech. Sls.	314-391-6543
NH	Nashua, Bell Controls	603-882-6984
NY	Hartsdale, Spectrum Sls.	914-472-8600
NY	Liverpool, M.M.Hare Co.	315-457-6859
NY	Syracuse, M. M. Hare	315-457-6859
NC	Raleigh, The Novus Grp.	919-883-7771
OH	Cincinnati, Tri-State Mktg.	513-761-7993
PA	Jenkintown, Monument Tech. Assocs.	215-884-3737
TX	Dallas, Allied Comps.	214-238-0408
WA	Redmond, Halbar Assocs.	206-882-0990
WI	Milwaukee, LTD Technlgs.	414-774-1000

XERCON, INC., P.O. Box 554, Portland, OR 97207, Tel: 503-292-8682, FAX: 503-292-8697; Empl.: 6; *Sls. Mgr.:* G. Osgood

XEROX CORPORATION, Xerox Square, 0-5, Rochester, NY 14644, Tel: 800-832-6979; Empl.: 100,367

XEROX IMAGING SYSTEMS, INC., Xerox Corp., 1215 Terra Bella Ave., Mountain View, CA 94043, Tel: 415-965-7900, 800-821-2898, TELEX: 701994 DATACOPY UO, FAX: 415-965-3474; Empl.: 235; *Sls. Mgr.:* Wayne Crandall, Dir. of Domestic Sls.; *Dist. Mgr.:* Nancy Ellickson

XERTEX CORP., See Rosemont Corp., Sensall National Sonics

XETEL CORPORATION, 8100 Cameron Rd., Austin, TX 78753, Tel: 512-834-2266, FAX: 512-834-9250; Empl.: 300; *Sls. Mgr.:* Mark Trutna

XICO

FAX: 818-709-5235

XICO, INC., 9737 Eton Ave., Chatsworth, CA 91311, Tel: 818-709-4403, TELEX: 709577, ESYLNK: 62253150; Empl.: 21; *Sls. Mgr.:* Ralph Reccia ..... **D•1117**

WORLD WIDE POWER SOLUTIONS INC., 1009 S.E. 12th Pl., No. 5, Cape Coral, FL 33990, Tel: 813-574-5505, FAX: 813-574-9512; Empl.: 10; *Sls. Mgr.:* David J. Paul, Dir. of Mktg.; *Dist. Mgr.:* David J. Paul

XICON CAPACITORS, P.O. Box 170537, Arlington, TX 76003, Tel: 817-561-2900; *Sls. Mgr.:* Drey Hayford

XICOR, INC., 851 Buckeye Court, Milpitas, CA 95035, Tel: 408-432-8888, TWX: 910-379-0033, FAX: 408-432-0640; FSC No.: 60395; Empl.: 910; *Sls. Mgr.:* Bruce Mattern; *Dist. Mgr.:* Bruce Mattern

XKD CORPORATION, 101 Cooper Court, Los Gatos, CA 95030, Tel: 408-395-3700, TELEX: 171946, FAX: 408-354-2606; *Sls. Mgr.:* Skip McLaughlin

XSIS ELECTRONICS, INC., 12620 W. 63rd St., Shawnee, KS 66216, Tel: 913-631-0448, TELEX: 437227, FAX: 913-631-1170; FSC No.: 57051; *Sls. Mgr.:* Jerry Dehnert ..... **A•1500-1501**

Local Sales Offices & Reps

AL	Huntsville, Murcota Corp.	205-539-8476
AZ	Phoenix, Western High Tech. Mktg.	602-266-2070
CA	Mission Viejo, Chaparrah Elctrn. Sls.	714-582-2950
CA	Saratoga, F & F Assoc.	408-446-2349
CT	Cheshire, Ashworth Assocs.	203-968-0656
IL	Schaumberg, Sieger Assocs.	312-310-8844
KY	Ft. Mitchell, G. W. Thelen Co.	606-341-8181
MD	Ellicott City, VPI, Inc.	301-461-2525
MA	Shrewsbury, Ashworth Assocs.	617-845-9688
MN	Eden Prairie, Aldridge Assocs., Inc.	612-944-8433
NJ	Fairfield, Addem Sls.	201-882-0993
NM	Albuquerque, Western High Tech Mktg.	505-884-2256
NY	E. Syracuse, R. D. Sherman	315-433-1165
NC	Winston-Salem, Murcota Corp.	919-722-9445
PA	Montgomeryville, Rufo Sys. Comps.	215-368-8495
TX	Sherman, Repmaster	214-247-6236
EXP	NY, Great Neck, Ad Auriema	516-487-0700

XYLOG CORP., 83 Hobart St, Hackensack, NJ 07601, Tel: 201-489-4040, FAX: 201-489-6745; Empl.: 30; *Sls. Mgr.:* Milton Frank ..... **D•2150**

YELLOW SPRINGS INSTRUMENT CO., Box 279, Yellow Springs, OH 45387, Tel: 513-767-7241, TELEX: 205437, FAX: 513-767-9353; Empl.: 380; *Sls. Mgr.:* M. Mason

YEW CORP., See Yokogawa Corp. of America

YOKOGAWA CORP. OF AMERICA, 2 Dart Rd., Newnan, GA 30265, Tel: 404-253-7000, FAX: 404-251-4088; Empl.: 450; *Sls. Mgr.:* Chuck Micallef; *Dist. Mgr.:* Jack Martz

YORK METAL PRODUCTS, INC., 34-20 12th St., Long Island City, NY 11106, Tel: 718-932-3660, FAX: 718-932-0007; Empl.: 45; *Sls. Mgr.:* Harold Miller

YORK TECHNOLOGY, INC., 210 N. Glenoaks Blvd., Ste. C, Burbank, CA 91502, Tel: 818-955-8927, TELEX: 990-968 York CA, FAX: 818-955-9728; *Sls. Mgr.:* Bradley E. Sousa

YUASA

FAX: 213-949-5527

YUASA BATTERY (AMERICA), INC., 9728 Alburtis Ave., Santa Fe Springs, CA 90670, Tel: 213-949-4266, TELEX: 696272; Empl.: 5,000; *Sls. Mgr.:* Les Biggins ..... **D•1535**

Local Sales Offices & Reps

AZ	Phoenix, Westrep	602-997-8899
CA	Huntington Bch., West Elctrn Sls.	213-493-5569
CA	San Jose, Novatronix	408-727-9530
CO	Denver, Lindberg Co.	303-758-9033
CT	Horth Haven, Kitchen & Kutchin	203-239-0212
FL	Tampa, Over and Over	813-626-9100
GA	Atlanta, Over and Over	404-449-6205
IL	Arlington Hgts., Brainard-Wilson Mktg.	312-437-2700
IA	Cedar Rapids, R.W. Kunz & Assocs.	319-396-5386
KS	Prairie Vlg., R.W. Kunz & Assocs.	913-648-3535
MA	Burlington, Kitchen & Kutchin	617-229-2660
MN	Minneapolis, Electronic Innovators, Inc.	612-941-0830
MO	St. Louis, R.W. Kunz & Assocs.	314-966-4977
NJ	Berkeley Hgts., Cambridge Allen & Assocs.	201-464-0203
NJ	Carlstadt, Yuasa Battery (Amer.) E. Reg. Off.	201-896-8800
NY	Rochester, Ossman Comps. Sls.	716-359-1200
NY	Syracuse, Ossman Comps. Sls.	315-455-6611
NC	Charlotte, Over and Over	704-542-9111
OH	Columbus, McFadden Sls.	614-459-1280
OK	Tulsa, Barry Sls.	918-749-7775
OR	Portland, Earl & Brown	503-245-2283
TX	Houston, Barry Sls.	713-784-5860
TX	Richardson, Barry Sls.	214-234-0255
UT	Salt Lake City, Lindberg Co.	801-277-2643
WA	Lynwood, Earl & Brown	206-885-5064
WI	Waukesha, Brainard-Wilson Mktg.	414-797-7940
Can	Pointe-Claire, Que., Tech Trek, Ltd.	514-697-3385
Can	Rexdale, Ont., Tech Trek, Ltd.	416-674-1717

Local Distributors

AL	Huntsville, Newark Elctrns.	205-837-9011
AL	Juneau, Juneau Elctrl. Equip.	907-586-2260
AZ	Glendale, Lynntronics	602-931-5981
CA	Buena Pk., Cypress Elctrns.	714-521-5230
CA	Costa Mesa, House of Batteries	714-642-8222
CA	San Diego, Tauber Elctrns.	619-274-7242
CA	Santa Clara, Cypress Elctrns.	408-980-2500
CO	Wheatridge, Cypress Elctrns.	303-431-2622
FL	Miami, Elctrn. Equip.	305-871-3500
GA	Norcross, Applied Power	404-263-0421
HI	Honolulu, Elctrl. Equip.	808-533-3881
IL	Downers Grove, Jarbo Battery	312-964-9358
IN	Indianapolis, Newark Elctrns.	317-872-7070
MD	Beltsville, Mark Elctrns.	301-595-5040
MA	Middleboro, Glynn Elctrns.	617-947-4262
MI	Brighton, Applied Power	313-229-6550
MI	Grand Rapids, Newark Elctrns.	616-214-6681
MN	Minneapolis, Bergquist Co.	612-835-2322
MS	Jackson, Newark Elctrns.	314-291-6200
NH	Salem, Cronin Elctrns.	603-898-4440
NJ	Clifton, Engrd. Assemblies	201-340-0600
NJ	Edison, Newark Elctrns.	201-572-2103
NY	Farmingdale, Battery Expeditors	516-752-0111
NY	FLushing, W & W Assocs.	718-961-2103
NY	Rochester, Masline Elctrns.	716-546-5373
NY	Rochester, Newark Elctrns.	716-473-6600
NC	Raleigh, Engrd. Assemblies	919-790-9700
OH	Columbus, Whitehead Elctrns.	614-224-1186
OH	Solon, Repco Elctrns.	216-248-8900
OR	Portland, Standard Batteries of Portland	503-234-7251
SC	Greenville, Newark Elctrns.	803-228-9610
TX	Allen, Prime Distrbg.	214-231-0170
TX	Dallas, Cypress Elctrns.	214-869-1435

UT Salt Lake City, Newark Elctrns. 801-484-8611
WA Redmond, Priebe Elctrns. 206-881-2363
WI Milwaukee, Newark Elctrns. 414-463-1100
Can Brampton, Ont., Zentronics 416-451-8445

ZAMBRE CO., INC., 2134 Old Middlefield Way, Mountain View, CA 94043, Tel: 415-968-9176

Z COMMUNICATIONS, INC., 5450 N.W. 33rd Ave., Ste. 100, Ft. Lauderdale, FL 33309, Tel: 305-735-1000, FAX: 305-735-1094; FSC No.: 1564A; Empl.: 20; *Sls. Mgr.:* Devang Patel

ZEBRA TECHNOLOGIES CORPORATION, 3455 Commercial Ave., Northbrook, IL 60062, Tel: 312-564-1800, TELEX: 206230; FSC No.: ;;;312-564-4714; Empl.: 110; *Sls. Mgr.:* Kevin O'Donnell

ZEHNTEL, INC., 2625 Shadelands Dr., Walnut Creek, CA 94598, Tel: 415-932-6900, TELEX: 371-6185, TWX: 910-385-6300; Empl.: 500; *Sls. Mgr.:* Dick Noren; *Dist. Mgr.:* Jim Mohr

CARL ZEISS, INC., One Zeiss Drive, Thornwood, NY 10594, Tel: 914-747-1800, TELEX: RCA 221834, TWX: WV64-6928

ZENDEX CORP., 6700 Sierra La., Dublin, CA 94568, Tel: 415-828-3000, TWX: 910-389-4009, FAX: 415-828-1574; Empl.: 42; *Sls. Mgr.:* Gary Jewell

ZENITH CRT & COMPONENTS OPERATIONS, 1000 Milwaukee Ave., Glenview, IL 60025, Tel: 312-391-7733; *Sls. Mgr.:* Norm Berkowitz

ZENITH

FAX: 312-391-7078

ZENITH COMPONENTS GROUP, Zenith Electronics Corp., 1000 Milwaukee Ave., Glenview, IL 60025, Tel: 312-391-7733, TELEX: 254396; *Sls. Mgr.:* George Zimmerer ..... **D•2151-2155**

Local Sales Offices & Reps

AL Huntsville, R.O. Whitesell & Assocs. ... 205-883-5110
AZ Phoenix, Pinnacle Comp. Sls. 602-994-0441
AZ Tucson, Pinnacle Comp. Sls. 602-886-1726
CA Calabasas, Centaur Corp. 818-704-1655
CA Irvine, Centaur Corp. 714-261-2123
CA Mtn. View, Taarcom, Inc. 415-960-1550
CA San Diego, Centaur Corp. 619-278-4950
CO Denver, Lindberg Co. 303-758-9033
CT Clinton, Selmark Assocs., Inc. 203-573-9088
GA Norcross, R.O. Whitesell & Assocs. ... 404-449-9190
IL Elk Grove Village, Oasis Sls. Corp. 312-640-1850
IN Ft. Wayne, R.O. Whitesell & Assocs. .. 219-432-5591
IN Indianapolis, R.O. Whitesell & Assocs. 317-359-9283
IN Kokomo, R.O. Whitesell & Assocs. 317-457-9127
KY Pewee Valley, R.O. Whitesell & Assocs. 502-241-1441
MA Millis, Selmark Assocs., Inc. 617-376-2914
MI Grand Blanc, R.O. Whitesell & Assocs. 313-695-0770
MI Grand Rapids, R.O. Whitesell & Assocs. 616-942-5420
MI Southfield, R.O. Whitesell & Assocs. .. 313-559-5454
MI St. Joseph, R.O. Whitesell & Assocs. .. 616-983-7337
MN Eden Prairie, Aldridge Assocs., Inc. 612-944-8433
NH Hopkinton, Selmark Assocs., Inc. 603-746-3299
NJ Fairfield, Metro Logic Corp. 201-575-5585
NJ Saddle Brook, Metro Logic Corp. 201-797-8844
NM Albuquerque, Lindberg Co. 505-881-1006
NC Fuquay-Varina, R.O. Whitesell & Assocs. 919-552-1122
NC Greensboro, R.O. Whitesell & Assocs. 919-273-1945
OH Cincinnati, R.O. Whitesell & Assocs. ... 513-521-2290
OH Cleveland, R.O. Whitesell & Assocs. .. 216-447-9020
OH Columbus, R.O. Whitesell & Assocs. .. 614-888-9396
OH Dayton, R.O. Whitesell & Assocs. 513-298-9546
OK Tulsa, CompTech 918-622-7744
OR Portland, Westerberg & Assocs. 503-620-1931
PA Allentown, Patterson Elctrns. Grp. 215-398-9668
PA Pittsburgh, R.O. Whitesell & Assocs. .. 412-963-6161
TN Knoxville, R.O. Whitesell & Assocs. ... 615-694-9476
TN Nashville, R.O. Whitesell & Assocs. ... 615-352-4760
TX Austin, CompTech 512-331-8922
TX Dallas, CompTech 214-751-1181
TX Houston, Comptech 713-776-8330
TX Irving, Comptech 214-751-1181
UT Salt Lake City, Lindberg Co. 801-277-2643
WA Bellevue, Westerberg & Assocs., Inc. .. 206-453-8881
WI Broodfield, Oasis Sls. Corp. 414-782-6660

Local Distributors

AL Huntsville, Allied Elctrns., Inc. 205-721-3500
CA Fremont, Allied Elctrns., Inc. 415-770-0590
CA Tustin, Allied Elctrns., Inc. 714-669-7140
CO Englewood, Allied Elctrns., Inc. 303-790-1664
FL Clearwater, Allied Elctrns., Inc. 813-539-0369
FL Pompano Bch., Allied Elctrns., Inc. 305-978-3008
GA Norcross, Allied Elctrns., Inc. 404-446-8595
IL Elgin, Allied Elctrns., Inc. 312-697-8200
IN Indianapolis, Allied Elctrns., Inc. 317-875-0448
MD Columbia, Allied Elctrns., Inc. 301-381-1560
MD Marlow Hgts., Allied Elctrns., Inc. 301-423-0161
MA Billerica, Allied Elctrns., Inc. 617-942-0150
MN Eden Prairie, Allied Elctrns., Inc. 612-829-7554
NH Nashua, Brevan Elctrns. 603-889-7230
NJ Mt. Laurel, Allied Elctrns., Inc. 609-234-7769
NY Mineola, Allied Elctrns., Inc. 516-248-2360
NY Rochester, Allied Elctrns., Inc. 716-244-9440
NC Raleigh, Allied Elctrns., Inc. 919-876-5845
OH Solon, Allied Elctrns., Inc. 216-248-4200
OK Tulsa, Norvell Elctrns., Inc. 918-254-8606
PA Pittsburgh, Allied Elctrns., Inc. 412-367-4124
TX Austin, Allied Elctrns., Inc. 512-389-3771
TX Austin, Norvell Elctrns., Inc. 512-837-5555
TX Dallas, Allied Elctrns., Inc. 214-553-4370
TX Dallas, Norvell Elctrns., Inc. 214-233-0020
TX Ft. Worth, Allied Elctrns., Inc. 817-336-5401
TX Houston, Norvell Elctrns., Inc. 713-777-1666
TX Humble, Allied Elctrns., Inc. 713-446-8005
WA Seattle, Allied Elctrns., Inc. 206-547-2827
WI New Berlin, Allied Elctrns., Inc. 414-796-1280

ZERCOM CORPORATION, P.O. Box 84, Zercom Drive, Merrifield, MN 56465-0084, Tel: 218-765-3151, FAX: 218-765-3900; Empl.: 65; *Sls. Mgr.:* Jeff Zernov

ZERO CORPORATION

FAX: 818-841-5618

ZERO CORP., 777 Front St., Burbank, CA 90503, Tel: 818-846-4191; Empl.: 1400; *Sls. Mgr.:* Doug Griffith ..... **C•1098-1099, 1122**

Local Sales Offices & Reps

AZ Phoenix, Howe & Howe Sls., Inc. 602-264-7971
CA Burbank, Zero-West Div. 818-846-4191
CA San Diego, San Diego Sls. Off. 619-271-7221
CO Boulder, Component Prod. Sls. Co. Inc. 303-530-2800
FL Clearwater, Zero-East Div. 813-531-8991
IL Elk Grove Village, Carlson Elctrns. Sls. 312-956-8240
IN Indianapolis, L.M. DeVoe Co. 317-842-3245
IA Cedar Rapids, Carlson Elctrns. Sls. ... 319-378-1450
MS Jackson, S. L. Welch 601-932-5534
MD Baltimore, Marktron 301-628-1111
MA Monson, Zero-East Div. 413-267-5561
MI Grosse Pointe Park, Greiner Assoc. Inc. 313-499-0188
MN Bloomington, Elctrn. Sls. Agcy. 612-884-8291
MO St. Louis, Cadon Techn. Sls. 314-645-8670
NY Commack, MTR, Inc. 516-462-9580
NM Albuquerque, Fry-Gates 505-262-1525
NY East Syracuse, Fountain Young & Co. 315-437-7733
NC Apex, Engineering Reps Assoc. 703-632-2365
OH Columbus, Tom Mulligan & Assocs. .. 614-457-2242
OR Lake Oswego, RTS, Inc. 503-244-4123
PA Boswell, B.E. Gibson 814-629-6772
PA Huntingdon Valley, Inacker Sls. 215-947-5660
SC Greenville, Engineering Reps Assoc. .. 703-632-2365
TX Garland, Tesco Inc. 214-681-1376
TX Houston, Milco Mktg. 214-783-2716
TX Richardson, Milco Mktg. 214-783-2716
UT Salt Lake City, Effective Sls. 801-266-9617
MD Rockville, Marktron 301-251-8990
WA Vashon, RTS, Inc. 206-285-1363

ZERO CORP., Zero East Div., 288 Main St., Monson, MA 01057, Tel: 413-267-5561, TWX: 710-354-1450; *Sls. Mgr.:* Roger St. Martin ..... **C•1122**

Local Sales Offices & Reps

AL Huntsville, BJR Mfg. Reps. 205-881-3569
CT Monson, Zero-East Div. 413-267-5561
IN Indianapolis, C.C. Electro Sls. 317-355-1508
IN Indianapolis, Leslie M. Devoe Co. 317-842-3245
MD Rockville, Marktron, Inc. 301-251-8990
MA Monson, Zero-East Div. 413-267-5561
MA Palmer, Benoit-Senecal Co. 413-283-8384
MI Grosse Pointe Pk., Greiner Assocs., Inc. 313-499-0188
MS Jackson, S. L. Welch & Assocs. 601-932-5534
NY Commack, MTR, Inc. 516-462-9580
NY Syracuse, Fountain Young Co. 315-437-7733
NC Martinsville, Engrg. Reps Assocs. 703-632-2365
OH Columbus, Tom Mulligan & Assoc. 614-457-2242
PA Boswell, B. E. Gibson 814-629-6772
PA Huntingdon Valley, Inacker Sls. 215-947-5660
SC Martinsville W. VA, Engrg. Reps Assocs. 703-632-2365
Can Islington, Ont., Pipe-Thompson Ltd. ... 416-236-2355

ZETA LABS., 2811 Orchard Parkway, San Jose, CA 95134, Tel: 408-434-3600, FAX: 408-433-0205; FSC No.: 31260; Empl.: 280; *Sls. Mgr.:* Mike Mallinger

Local Sales Offices & Reps

AZ Chandler, Blackhart Assoc. 602-831-2566
AZ Phoenix, Blackhart Assocs. 602-893-3488
CA Palo Alto, RF Assocs. 415-494-3331
TX Dallas, McDonalds Assocs. 214-239-3293

ZEUS INDL. PRODS. INC., P.O. Box 298, Raritan, NJ 08869, Tel: 201-526-0800, 800-526-3842, TWX: 710-480-9346, FAX: 201-526-5699; FSC No.: 32039; Empl.: 150; *Sls. Mgr.:* Jeffrey J. Tourville; *Dist. Mgr.:* Michael C. Tourville

ZEVATECH, INC., 2700 Gateway Centre Blvd. Ste., Morrisville, NC 27560, Tel: 919-460-0111, FAX: 919-469-0480; Empl.: 70; *Sls. Mgr.:* Bob Black; *Dist. Mgr.:* Bob Black

ZEXCO, 5526 Murietta Ave., Van Nuys, CA 91401, Tel: 818-997-7895

ZIATECH, 3433 Roberto Ct., San Luis Obispo, CA 93401, Tel: 805-541-0488, TELEX: 4992316, FAX: 805-541-5088; Empl.: 65; *Sls. Mgr.:* Jim Eckford

ZIERICK

FAX: 914-666-0216

ZIERICK MANUFACTURING CORP., 56 Radio Circle, Mt. Kisco, NY 10549, Tel: 914-666-2911, 800-882-8020, TWX: 710-571-2143; Empl.: 120; *Sls. Mgr.:* L. T. Noyes; *Dist. Mgr.:* Jack Becker ..... **C•1580**

Local Sales Offices & Reps

IL Palatine, Claeson Assocs. 312-359-7230

Local Distributors

CA Fremont, Alatec Prods. 408-279-8895
CA Hayward, Arow Fasteners 415-487-2100
CA Laguna Hills, Yarbrough Timco 714-859-7021
CA Mission Hills, Coast Air 818-898-2288
CA N. Hollywood, Alatec Prods. 818-764-5600
CA San Jose, Bisco Inds. 408-435-8980
CO Denver, Hardware Specialty 303-371-8553
FL Winter Pk., Hardware Specialty 305-677-8500
MA Marlborough, Hardware Specialty 617-481-8622
MA Winchester, Rush Inds. 617-729-5800
MO Bridgeton, Alatec Prods. 314-298-0100
NJ Pine Brook, Alatec Prods. 201-227-8140
NY Long Island City, Hardware Specialty 718-361-9393
NY Peekskill, Lawrence Tufts 914-739-2107
OR Beaverton, Comps. Resources 503-641-8488
WA Redmond, Comps. Resources 206-454-8666
Can Concord, Ont., Zierick Canada Ltd. 416-669-1429

ZIPPERTUBING CO., Box 61129, Los Angeles, CA 90061, Tel: 213-321-3901, TWX: 910-346-6713, FAX: 213-321-3086; Empl.: 120; *Sls. Mgr.:* Terry Plummer

ZIRMEX, See Degussa Electronics, Hybrid Div.

ZI-TECH INSTRUMENT CORP., P.O. Box 391567, Mountain View, CA 94039-1567, Tel: 415-966-8484, TELEX: 334-447, FAX: 415-966-8201; Empl.: 15; *Sls. Mgr.:* J. Ziman

Z-LINE POWER CONTROLLERS, See Pulizzi Engineering, Inc.

ZYLAB CORPORATION, 3105-T N. Wilke Rd., Arlington Heights, IL 60004, Tel: 312-632-1100, TELEX: 38 3422 ZYLAB CGO, TWX: 910-380-4603 ZYLAB CGO, ESYLNK: 62753465, FAX: 312-632-1129; Empl.: 21; *Sls. Mgr.:* Tom Priestley

ZYMOS CORP., 477 N. Mathilda Ave., Sunnyvale, CA 94086, Tel: 408-730-8800, 408-730-5400, TWX: 910-339-9530; *Sls. Mgr.:* Jeff Jacobsen

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MINIGLOSSARY
BASIC ASCII CODE

				b7	0	0	0	0	1	1	1	1
				b6	0	0	1	1	0	0	1	1
				b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1		0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	|
1	1	0	1	13	CR	GS	-	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

Control Character Representations

NUL	Null
SOH	Start of Heading (CC)
STX	Start of Text (CC)
ETX	End of Text (CC)
EOT	End of Transmission (CC)
ENQ	Enquiry (CC)
ACK	Acknowledge (CC)
BEL	Bell
BS	Backspace (FE)
HT	Horizontal Tabulation (FE)
LF	Line Feed (FE)
VT	Vertical Tabulation (FE)
FF	Form Feed (FE)
CR	Carriage Return (FE)
SO	Shift Out
SI	Shift In
DLE	Data Link Escape (CC)
DC1	Device Control 1
DC2	Device Control 2
DC3	Device Control 3
DC4	Device Control 4
NAK	Negative Acknowledge (CC)
SYN	Synchronous Idle (CC)
ETB	End of Transmission Block (CC)
CAN	Cancel
EM	End of Medium
SUB	Substitute
ESC	Escape
FS	File Separator (IS)
GS	Group Separator (IS)
RS	Record Separator (IS)
US	Unit Separator (IS)
DEL	Delete

(CC) Communication Control
(FE) Format Effector
(IS) Information Separator

Special Graphic Characters

SP	Space
!	Exclamation Point
|	Logical OR
"	Quotation Marks
#	Number Sign
$	Dollar Sign
%	Percent
&	Ampersand
'	Apostrophe
(	Opening Parenthesis
)	Closing Parenthesis
*	Asterisk
+	Plus
,	Comma
-	Hyphen (Minus)
.	Period (Decimal Point)
/	Slant
:	Colon
;	Semicolon
<	Less Than
=	Equals
>	Greater Than
?	Question Mark
@	Commercial At
[	Opening Bracket
\	Reverse Slant
]	Closing Bracket
^	Circumflex
¬	Logical NOT
_	Underline
`	Grave Accent
{	Opening Brace
¦	Vertical Line (This graphic is stylized to distinguish it from Logical OR)
}	Closing Brace
~	Tilde

CHARACTERISTICS OF BATTERIES AND FUEL CELLS

System	Anode	Cathode	Theoretical battery		Practical battery		
			Voltage, V	Capacity, Ah/kg	Typical voltage, V	Capacity[a]	
						Wh/kg	Wh/dm³
Primary:							
Leclanche	Zn	MnO_2	1.6	230	1.2	65	175
Magnesium	Mg	MnO_2	2.0	270	1.5	100	195
Organic cathode	Mg	*m*-DNB	1.8	1,400	1.15	130	180
Alkaline MnO_2	Zn	MnO_2	1.5	230	1.15	65	200
Mercury	Zn	HgO	1.34	185	1.2	80	370
Mercad	Cd	HgO	0.9	165	0.85	45	175
Silver oxide	Zn	AgO	1.85	285	1.5	130	310
Zinc-air	Zn	Air (O_2)	1.6	815	1.1	200	190
Li-organic electrolyte	Li	[b]	2.1-5.4	130-660	1.8-3.2	250	400
Secondary:							
Lead-acid	Pb	PbO_2	2.1	55	2.0	37	70
Edison	Fe	Ni oxides	1.5	195	1.2	29	65
Nickel-cadmium	Cd	Ni oxides	1.35	165	1.2	33	60
Silver-zinc	Zn	AgO	1.85	285	1.5	100	170
Silver-cadmium	Cd	AgO	1.4	230	1.05	55	120
Zinc-nickel oxide	Zn	Ni oxides	1.75	185	1.6	55	110
Zinc-air[c]	Zn	Air (O_2)	1.6	815	1.1	150	155
Cadmium-air[c]	Cd	Air (O_2)	1.2	475	0.8	90	90
Zinc-O_2	Zn	O_2	1.6	610	1.1	130	120
H_2-O_2	H_2	O_2	1.23	3,000	0.8	45	65
Reserve:							
Cuprous chloride	Mg	CuCl	1.5	240	1.4	45	65[d]
Silver-chloride	Mg	AgCl	1.6	170	1.5	60	95[d]
Zinc-silver oxide	Zn	AgO	1.85	285	1.5	30	75[e]
Thermal	Ca	[b]	2.8	240	2.6	10	20[f]
Ammonia-activated	Mg	*m*-DNB	2.2	1,400	1.7	22	60[g]
High-temperature	NA	S	2.1	685	1.8	200	[h]
	Li	S	2.2	1,150	1.8	200	[i]
Solid electrolyte	Ag	Polyiodide	0.66	. . .	0.6	180	75[j]
Fuel cell:							
Hydrogen[c]	H_2	Air	1.23	26,000	0.7		[k]
Hydrazine[c]	N_2H_4	Air	1.5	2,100	0.7	800[b]	[l]
Methanol[c]	CH_2OH	Air	1.3	1,400	0.9	175[b]	185[m]

a Delivered capacity when discharged at normal temperatures (20°C) at normal discharge rates.
b Based on fuel consumption only.
c Weight of air not considered in computation of watt hours.
d Water-activated
e Automatically activated; high rate discharge; 2- to 10-min rate.
f Fused salt; heat-activated; high rate discharge; 2- to 10-min rate.
g Four-minute discharge rate.
h β-alumina electrolyte, 300°C operation.
i Fused salt; 350°C operation.
j Solid $RbAg_4I_5$ electrolyte.
k Several different cathode materials used.
l Fuel consumption is based on source of H_2.
m Based on methanol battery-fuel supply in situ.

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MINIGLOSSARY CAPACITORS

Anode: One of two plates or conductors. In polarized capacitors, the anode should be connected to the positive conductor in the circuit.

Capacitive Reactance: The opposition (in ohms) of capacitance to the flow of alternating current, equal to the reciprocal of the product of the angular frequency (2π times frequency in Hertz) of the current times the capacitance in farads.

Cathode: One of two plates or conductors. In electrostatic capacitors the cathode is metallic. In electrolytic capacitors the cathode is a liquid, gel or other conductive material which is in intimate contact with a metallic cathodic connection.

Dielectric Constant: The ratio of the capacitance of a capacitor with some material other than air between the capacitor plates to the capacitance of the same capacitor with air between the plates. For example, the dielectric constants of air, Teflon®, polystyrene and ruby mica are 1, 2.1, 2.6 and 5.4, respectively.

Electrolytic: A capacitor with one metallic conductor (generally the anode) and with a liquid or semiconductor cathode. Nonpolarized electrolytic capacitors generally have two equal anodes as well as the liquid cathode. These anodes operate alternately as anode and cathodic connection as alternating current is applied.

Electrostatic: One of two general classes of capacitors in which two or more discrete metallic conductors are present and separated by an insulating dielectric material. Examples include: mica, ceramic, film, and paper types.

Farad: The basic unit of measure in capacitors. A capacitor charged to one volt with a charge of one coulomb (one ampere flowing for one second) has a capacitance of one farad. Capacitors are generally rated at portions of a farad (microfarads or picofarads).

1 farad (F) = 1,000,000 microfarads (μF) 1 microfarad (μF) = 1,000,000 picofarads (pF)

Impedance: All capacitors exhibit impedance. It is a function of capacitor type and internal construction. This can be particularly important in certain applications such as filters for switching power supplies. Capacitors used in these applications often have special multiple tab construction to shorten current paths and to reduce internal resistance.

Leakage Current: Expressed as dcl for electrolytic capacitors, a measure of the intrinsic losses in a charged capacitor. Generally speaking, the lower the dcl, the higher quality the capacitor.

Power Factor: A measure of the overall efficiency of a capacitor. Power factor ratings take all internal losses into consideration in a complex formula. This parameter of certain capacitors is often very important in AC applications such as motor-start and/or motor-run capacitors

Rated Voltage: The rated working voltage of a capacitor. Generally expressed in DC Volts (Vdcw). This is the voltage at which a capacitor may be safely operated at 25°C continuously within its overall parameters.

Ripple Current: The total amount of alternating and direct current that may be applied to an electrolytic capacitor under stated conditions. In general, the higher the ripple current applied, the shorter the operating life of the capacitor will be. Application of significantly higher than rated ripple currents can shorten the capacitor life dramatically and may even cause catastrophic failure (explosion).

Surge Voltage: The momentary surge voltage which may be applied for a stated length of time without doing permanent damage to the unit.

Temperature: Capacitors are generally rated at 25°C at sea level under specific humidity conditions. Operating temperature ranges are also given, along with derating (reliability) curves for operation at temperatures other than 25°C.

Temperature Coefficient: Expressed as TC in ppm (parts per million) or in percent (%) from the norm of 25°C. This is seldom a straight line and may vary widely for certain types. Most capacitors have positive TC in that the capacitance increases as temperature increases. Some types, however, have negative TC in that the capacitance decreases as temperature increases.

Ceramic Capacitor Codes
(Capacitance Given In pF)

Color	Digit	Multiplier	Tolerance			Temperature Coefficient ppm°C	Significant Figure	Multiplier
			Class 1		Class 2			
			10pF or less	Over 10pF				
Black	0	1	±2.0pF	±20%	±20%	0	0.0	–1
Brown	1	10	±0.1pF	±1%		–33		–10
Red	2	100		±2%		–75	1.0	–100
Orange	3	1000		±3%		–150	1.5	–1000
Yellow	4	10000			+100% –0%	–220	2.0	–10000
Green	5		±0.5pF	±5%	±5%	–330	3.3	+1
Blue	6					–470	4.7	+10
Violet	7					–750	7.5	+100
Gray	8	0.01	±0.25pF		+80% –20%	+150 to –1500		+1000
White	9	0.1	±1.0pF	±10%	±10%	+100 to –750		+10000
Silver								
Gold								

MINIGLOSSARY
BASIC CAPACITOR FORMULAS

I. Capacitance (farads)

English: $C = \frac{.224\,K\,A}{t_D}$

Metric: $C = \frac{.0884\,K\,A}{t_D}$

II. Energy stored in capacitors (Joules, watt-sec)

$E = \frac{1}{2}\,CV^2$

III. Linear charge of a capacitor (Amperes)

$I = C\frac{dV}{dt}$

IV. Total Impedance of a capacitor (ohms)

$Z = \sqrt{R_s^2 + (X_C - X_L)^2}$

Where $Rs = ESR$

V. Capacitive Reactance (ohms)

$X_C = \frac{1}{2\pi fC}$

VI. Inductive Reactance (ohms)

$X_L = 2\pi fL$

VII. Phase Angles:

Ideal Capacitors: Current leads voltage 90°
Ideal Inductors: Current lags voltage 90°
Ideal Resistors: Current in phase with voltage

VIII. Dissipation Factor

$DF = \tan\delta \text{ (loss angle)} = \frac{ESR}{X_c} = (2\pi fC)\,(ESR)$

IX. Power Factor

PF = Sine δ (loss angle) = Cos ϕ (phase angle)
PF = DF (when less than 10%)

X. Quality Factor (dimensionless)

$Q = \text{Cotan } \delta \text{ (loss angle)} = \frac{1}{DF}$

XI. Equivalent Series Resistance (ohms)

$ESR = (DF)\,(Xc) = (DF)\,(\frac{1}{2}\pi fC)$

XII. Power Loss (watts)

Power loss $= (2\pi fCV^2)\,(DF)$

XIII. KVA (Kilowatts)

$KVA = 2\pi fCV^2 \times 10^{-3}$

XIV. Temperature Characteristic (ppm/°C)

$TC = \frac{Ct - C_{25}}{C_{25}\,(T_t - 25)} \times 10^6$

XV. Cap Drift (%)

$C.D. = \frac{C_1 - C_2}{C_1} \times 100$

XVI. Reliability of Ceramic Capacitors

$\frac{L_O}{L_t} = \left(\frac{V_t}{V_O}\right)^x \left(\frac{T_t}{T_O}\right)^\tau$

XVII. Capacitors in Series (current the same)

Any number: $\frac{1}{C_T} = \frac{1}{C_1} + \frac{1}{C_2} \text{ --- } + \frac{1}{C_N}$

Two: $C_T = \frac{C_1\,C_2}{C_1 + C_2}$

XVIII. Capacitors in Parallel (voltage the same)

$C_T = C_1 + C_2 \text{ --- } + C_N$

XIX. Aging Rate

A.R. = % Δ C/decade of time

XX. Decibels

$db = 20 \log \frac{V_1}{V_2}$

Metric prefixes:

Pico	$\times 10^{-12}$
Nano	$\times 10^{-9}$
Micro	$\times 10^{-6}$
Milli	$\times 10^{-3}$
Deci	$\times 10^{-1}$
Deca	$\times 10$
Kilo	$\times 10^{3}$
Mega	$\times 10^{6}$
Giga	$\times 10^{9}$
Tera	$\times 10^{12}$

Symbols:

K	=	Dielectric Constant
A	=	Area of electrode overlap
t_D	=	Dielectric thickness
V	=	Voltage (volts)
t	=	time (hours)
R_S	=	Series Resistance (ohms)
f	=	frequency (Hertz)
L	=	Inductance (henries)
δ	=	Loss angle
ø	=	Phase angle
x+y	=	Exponent effect of voltage and temperature
L_O	=	Operating life (hours)
L_t	=	Test life (hours)
V_t	=	Test voltage (volts)
V_o	=	Operating voltage (volts)
T_t	=	Test temperature (°C)
T_o	=	Operating temperature (°C)

eem MINIGLOSSARY of CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination*. This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float*. Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof*. May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card*. The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement*.

Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage*. Can be confused with the term used to describe how many times a connector may be mated and separated.

Withstanding voltage: Also called *test voltage*. The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

MAXIMUM CURRENT CAPACITY—CONDUCTORS

Size, AWG	MIL-W-5088				National Electrical Code	Underwriters Laboratory		American Insurance Association	500 c mils/A
	Copper		Aluminum			60°C	80°C		
	Single-wire	Wire-bundled	Single-wire	Wire-bundled					
30	...	...	...	...	...	0.2	0.4	...	0.20
28	...	...	...	...	...	0.4	0.6	...	0.32
26	...	...	...	...	...	0.6	1.0	...	0.51
24	...	...	...	...	...	1.0	1.6	...	0.81
22	9	5	...	...	...	1.6	2.5	...	1.28
20	11	7.5	...	...	...	2.5	4.0	3	2.04
18	16	10	...	...	6	4.0	6.0	5	3.24
16	22	13	...	...	10	6.0	10.0	7	5.16
14	32	17	...	...	20	10.0	16.0	15	8.22
12	41	23	...	...	30	16.0	26.0	20	13.05
10	55	33	...	...	35	...	...	25	20.8
8	73	46	58	36	50	...	...	35	33.0
6	101	60	86	51	70	...	...	50	52.6
4	135	80	108	64	90	...	...	70	83.4
2	181	100	149	82	125	...	...	90	132.8
1	211	125	177	105	150	...	...	100	167.5
0	245	150	204	125	200	...	...	125	212.0
00	283	175	237	146	225	...	...	150	266.0
000	328	200	...	...	275	...	...	175	336.0
0000	380	225	...	...	325	...	...	225	424.0

MINIGLOSSARY
BASIC
EBCDIC CODE

Bit Positions 4, 5, 6, 7	Second Hexadecimal Digit	Digit Punches	00				01				10				11				Bit Positions 0, 1
			00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bit Positions 2, 3
			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	First Hexadecimal Digit
			12				12	12		12	12	12		12	12				Zone Punches
				11				11	11	11		11	11	11		11			
					0		0		0	0	0		0	0			0		
			9	9	9	9	9	9	9	9									Digit Punches
			①	②	③	④	⑤	⑥	⑦	⑧					⑨	⑩	⑪	⑫	
0000	0	8-1	NUL	DLE	DS		SP	&	-									0	8-1
0001	1	1	SOH	DC1	SOS				⑬		a	j			A	J	⑭	1	1
0010	2	2	STX	DC2	FS	SYN					b	k	s		B	K	S	2	2
0011	3	3	ETX	TM							c	l	t		C	L	T	3	3
0100	4	4	PF	RES	BYP	PN					d	m	u		D	M	U	4	4
0101	5	5	HT	NL	LF	RS					e	n	v		E	N	V	5	5
0110	6	6	LC	BS	ETB	UC					f	o	w		F	O	W	6	6
0111	7	7	DEL	IL	ESC	EOT					g	p	x		G	P	X	7	7
1000	8	8		CAN							h	q	y		H	Q	Y	8	8
1001	9	8-1		EM							;	r	z		I	R	Z	9	9
1010	A	8-2	SMM	CC	SM		¢	!	⑮	:									8-2
1011	B	8-3	VT	CU1	CU2	CU3	.	$	,	#									8-3
1100	C	8-4	FF	IFS		DC4	<	*	%	@									8-4
1101	D	8-5	CR	IGS	ENQ	NAK	(	)	_	'									8-5
1110	E	8-6	SO	IRS	ACK		+	;	>	=									8-6
1111	F	8-7	SI	IUS	BEL	SUB	I	¬	?	"									8-7
			12				12				12	12		12	12	12		12	Zone Punches
				11				11				11	11	11		11	11	11	
					0				0		0		0	0	0		0	0	
			9	9	9	9									9	9	9	9	

Card Hole Patterns

①	12-0-9-8-1	⑤	No-Punches	⑨	12-0	⑬	0-1
②	12-11-9-8-1	⑥	12	⑩	11-0	⑭	11-0-9-1
③	11-0-9-8-1	⑦	11	⑪	0-8-2	⑮	12-11
④	12-11-0-9-8-1	⑧	12-11-0	⑫	0		

Control Character Representations

ACK	Acknowledge
BEL	Bell
BS	Backspace
BYP	Bypass
CAN	Cancel
CC	Cursar Control
CR	Carriage Return
CU1	Customer Use 1
CU2	Customer Use 2
CU3	Customer Use 3
DC1	Device Control 1
DC2	Device Control 2
DC4	Device Control 4
DEL	Delete
DLE	Data Link Escape
DS	Digit Select
EM	End of Medium
ENQ	Enquiry
EOT	End of Transmission
ESC	Escape
ETB	End of Transmission Block
ETX	End of Text
FF	Form Feed
FS	Field Separator
HT	Horizontal Tab
IFS	Interchange File Separator
IGS	Interchange Group Separator
IL	Idle
IRS	Interchange Record Separator
IUS	Interchange Unit Separator
LC	Lower Case
LF	Line Feed
NAK	Negative Acknowledge
NL	New Line
NUL	Null
PF	Punch Off
PN	Punch On
RES	Restore
RS	Reader Stop
SI	Shift In
SM	Set Mode
SMM	Start of Manual Message
SO	Shift Out
SOH	Start of Heading
SOS	Start of Significance
SP	Space
STX	Start of Text
SUB	Substitute
SYN	Synchronous Idle
TM	Tape Mark
UC	Upper Case
VT	Vertical Tab

Special Graphic Characters

¢	Cent Sign
.	Period, Decimal Point
<	Less-than Sign
(	Left Parenthesis
+	Plus Sign
I	Logical OR
&	Ampersand
!	Exclamation Point
$	Dollar Sign
*	Asterisk
)	Right Parenthesis
;	Semicolon
¬	Logical NOT
-	Minus Sign, Hyphen
/	Slash
,	Comma
%	Percent
_	Underscore
>	Greater-than Sign
?	Question Mark
:	Colon
#	Number Sign
@	At Sign
'	Prime, Apostrophe
=	Equal Sign
"	Quotation Mark

ecm MINIGLOSSARY ENCAPSULATION

MATERIALS/HANDLING

Catalyst: A substance which changes the *rate* of chemical reaction. Very small quantities can cause fast change.

Conformal coating Sprayed or dipped. A thin conformal jacket which protects an assembly from moisture or other degrading environments.

Curing agent: See catalyst.

Hardener: See catalyst.

Hermetic: A permanent gas-tight seal.

RTV: Room Temperature Vulcanizing. Associated with silicone rubber sealants which vulcanize at room temperature.

Thermoplastic: Plastic materials which can be made to flow *repeatedly* with the application of heat.

Thermosetting: Plastics which once cured cannot be made to flow again.

Thixotropy: The property of a coating compound which has low viscosity when agitated, but which thickens when the agitation ceases.

Viscosity: Measured in units of *poise* or *centipoise*. The property of a liquid which resists internal flow. Low viscosity equates with thin and vice-versa.

PROCESSING

Casting: Parts or assemblies are placed in a mold. Encapsulating material is added and cured. Part is then removed from the mold.

Dip coating: Part or assembly is dipped into the encapsulating material. Final thickness is determined by number of dips, viscosity, rate of withdrawal, and temperature.

Embedding: Wherein an encapsulant substantially fills all voids in and about an assembly.

Impregnation: A process of encapsulation involving evacuating all air and then allowing the encapsulating material to flow in and fill all voids.

Molding: Similar to casting except this process usually implies multicavity molds and costly machines.

Potting: Wherein the part or assembly is immersed in an encapsulating material contained in a shell which becomes a permanent outer surface after curing.

DIELECTRIC

Arc resistance: An encapsulant's resistance to the formation of a conductive path or track. Measured in time.

Breakdown voltage: The voltage at which an encapsulant fails electrically.

Capacitance: The property of conductors and dielectrics which allows the storage of an electrical charge when the voltage is applied.

Corona: A luminous discharge of electricity due to air ionization when a certain voltage is reached. Can be internal or external. The formation of ozone can cause rapid deterioration of certain materials.

Dielectric: Insulator (Nonconductor.)

Dielectric constant: The property of a material that determines its ability to store electrostatic energy.

Dielectric strength: The ratio of dielectric breakdown to the thickness of insulating material.

Dissipation factor: The ratio of a dielectric material's energy losses.

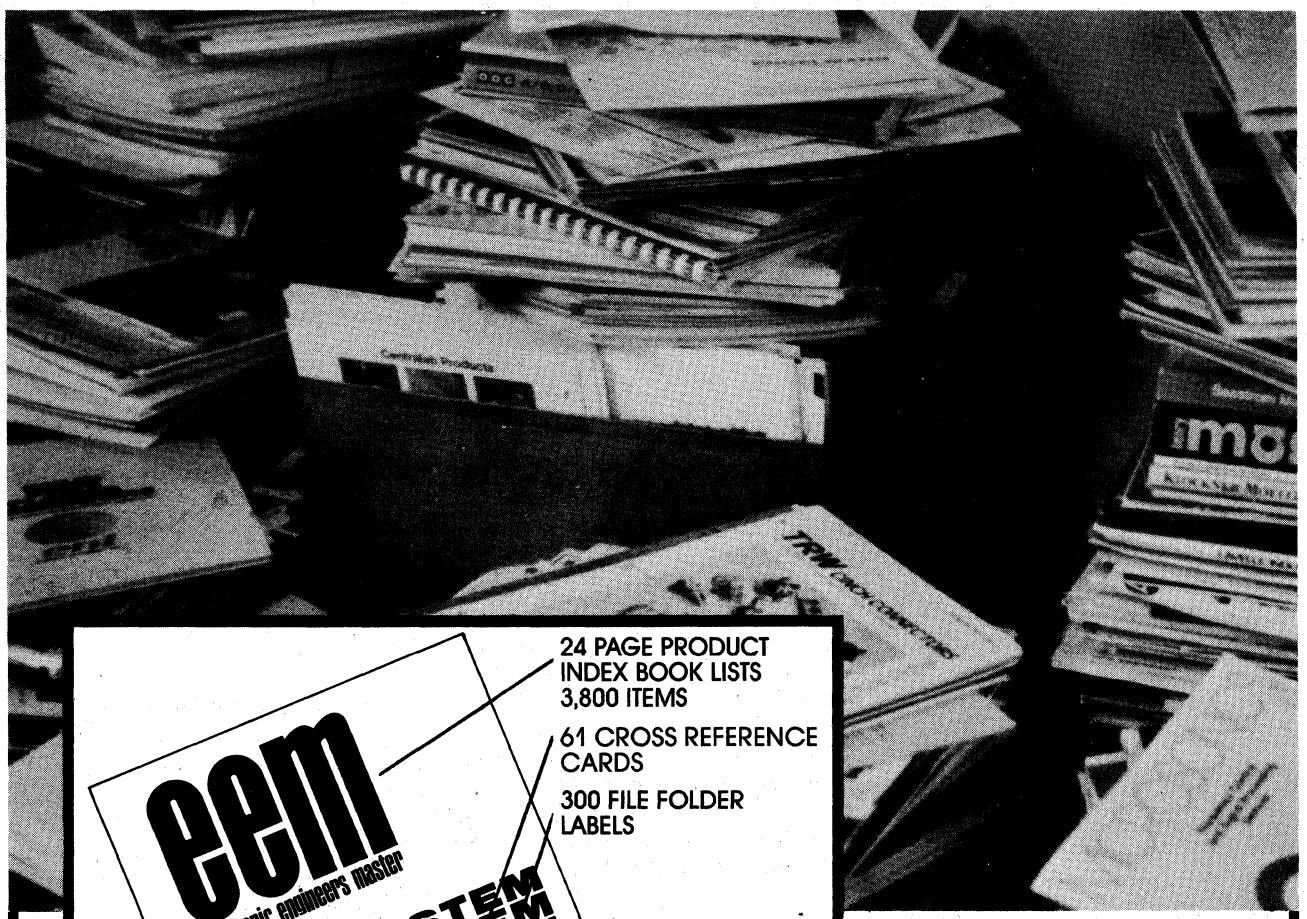
Flashover: Point at which an electric discharge occurs around an edge or across a surface. Can result in a carbon track and permanent degradation.

Insulation resistance: (IR) An insulating material's total DC leakage.

Surface resistivity: The resistance of the surface of an insulating material to the flow of direct current.

Voltage endurance: Sometimes called corona resistance. The ability of a material to withstand the application of sustained high voltage.

Volume resistivity: The resistance of a material to direct current flow as a measure of volume. Expressed as ohm-centimeters.



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ACTO - Systron-Donner Instrument
ACUFLEX - Acme
ACU-MIN - Moody Tools
ACU-PROBE - EDL
ACU-THERM ANALOG - EDL
ADAPT-A-BOARD - Emulation Technology
ADAPT-A-POD - Emulation Technology
ADAPT-A-SOCKET - Emulation Technology
ADAPT-A-SWITCH - Arrow Hart Components
ADAPTATONE - Edwards
ADAS - Acurex /Autodata
ADC - Accugraph
ADD-A-PAK - International Rectifier
AD-MU - Ad-Vance Magnetics
ADRE - Bently Nevada
AEC - Andon Elctrns.
AEGIS - Kalglo Elctrns.
AEP - Applied Engineering Products
AEROFOIL - Aerovox
AEROGLAS RM - Aluminum Filter
AEROGROUND - Tech Spray
AEROKRAFT - Aerovox
AEROMET - Aerovox
AEROPAK - Aerovox
AERORAD - Judd Wire
AEROSAFE - Aerovox
AEROSTOR - Aerovox
AEROVAR - Aerovox
AGASTAT - Amerace Corporation
AGGREGOMETER - Chrono-log
AIMSERT - Aimsco
AIMSLOCK - Aimsco
AiR CELL - Eveready Battery
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AIR-JET - FTS Systems
AIR MAZE - Heat System
AIROUT - Furane Products
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AIRWATCH - Baker
AIS-PL/I - Applied Information Systems
AJAXOMATIC - Ajax Magnethermic
ALAUTRONEX - Sel-Rex
ALCOLITE - Augat Alcoswitch
ALERT - Beswick:Cooper U.K. Ltd.
ALFCO - Aluminum Filter
ALGCO - Auburn Mfg.
ALGOCLAD - Sel-Rex
ALLOY MONITOR - Sensor
ALLROS - Alpha Metals
ALLY - Integrated Digital Products
ALL-4-ONE - Signal Transformer
ALPAC - Semtech
ALPHABON - Alpha Wire
ALPHA-KIT - Contact East
ALPHLOC - Alpha Wire
ALU-FLEX - Auburn Mfg.
ALUMALOY - Lab-Line Instruments
ALUMAPAK - Sprague Electric
ALUMINEX - CTS Corporation
A-LUM-O-AIRE - Carey Electronics Engineering
ALU-SOL - Multicore Solders
AMBITROL - Power Designs
AMLIT - Mechanical Products
AMMONIASTAT - Sierra Monitor
AMPACT - AMP
AMPAK - Pacer Industries
AMP-BARREL - AMP
AMP-BLADE - AMP
AMP-CLAMP - Simpson Electric
AMP EDGE - AMP
AMP-FIT - AMP
AMP-IN - AMP
AMPIP - AMP
AMPLASTIC - AMP
AMP-LEAF - AMP
AMPLI-BOND - AMP
AMPLICENTER - Harris
AMPLIFIER - Eveready Battery
AMPLIFLEX - AMP
AMPLIMATE - AMP
AMPLI-PRESS - AMP
AMPLISEAL - AMP
AMPLIVAR - AMP
AMPLIVERSAL - AMP
AMPLI-VOX - Perma Power Elctrns.
AMP-LOK - AMP
AMP-O-LECTRIC - AMP
AMP-O-MATIC - AMP
AMPOMATOR - AMP
AMPORTAPOWER - AMP
AMPOWER - AMP
AMP PANEL-PAK - AMP
AMP-REG - Computer Products
AMPSEAL - AMP
AMPSULATION - AMP
AMP-TAB - AMP
AMP-TAPEMATIC - AMP
AMP-TAPETRONIC - AMP
AMPTRAN - Amprobe Instrument
AMP-TRAP - Gould Shawmut
AMRON - Eldre Corporation
ANA-LED - Simpson Electric
ANALOK - Analog Devices
ANASTOR - ITW Paktron
ANGLYZER - Waters Manufacturing
ANGSTOR - ITW Paktron
ANOMATIC - Anorad
ANORAIL - Anorad
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ANOROUND - Anorad
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AQUA-SOL - Alpha Metals
AQUA-SURE - Alpha Metals
AQUA-THERM - Dolph, John C.
ARAX - Multicore Solders
ARC-QUENCH - Kaiser Systems
AREMCOBOND - Aremco Products
AREMCOLOX - Aremco Products
ARGUS - IEE (Industrial Electronic Engineers)
ARMAFLEX - Armstrong World Inds.
ARMO-DUR - Shure Brothers
ARMORWEAVE - Antenna Specialists
ARNAVAR - Arnold Engineering
ARNOFLEX - Arnold Engineering
ARNOGLASS - Arnold Engineering
ARNOKROME - Arnold Engineering
ARNON - Arnold Engineering
ARNOSPRING - Arnold Engineering
ASCI - Advanced Systems Concepts
ASCO - Automatic Switch
ASID - Three-Five Sys.

ASSET - Inlab
ASTRA - NEC Information Systems
ASTRACIDE - Heat System
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ATMOSCOPE - Edsyn
ATO - Littelfuse
ATOM - Sprague Electric
ATOMSOLVE - Atomergic Chemetals
AUDIOLARM - Bell, Floyd
AUGTENNA - Teledyne Ryan Electronics
AURION-X - Sel-Rex
AUROBOND - Sel-Rex
AURORA - Data Translation
AUTHENTI-KEY - ACS Communications Systems
AUTO-VAC - Edsyn
AUTOBALANCE - Ballantine Laboratories
AUTOCAD - Autodesk
AUTOCAL - Datron Instrs.
AUTOCALC - Acurex /Autodata
AUTOFUSE - Littelfuse
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AVI-LOK - Avibank Manufacturing
AX-PAK - ITW Paktron
AZURE II - Babcock Display Products
A-50 - Amphenol RF Operations
BACK PACK - International Instrumentation
BAILATCH - Hartwell
BAL-CON - EBY
BALLASTLESS - A.L.E. Sys.
BALLISTRAK - EG & G Flow Technology
BALL-LOK - Avibank Manufacturing
BAM - Berkeley Process Control
BANDOMATIC - Burndy Corporation
BANTAM - Burndy Corporation
BANTAMATE II - Burndy Corporation
BARATRON - MKS Instruments
BAR-CAP - Dielectric Labs.
BARGUARD - Control Module
BAR-LOK - Dennison Mfg.
BASICPAC - Acurex /Autodata
BEAMBUILDER - Sencore
BEAMSCAN - Photon
BEAR PAW - Jobmaster
BECON - Teledyne Kinetics
BEE LINE - Hughes Aircraft
BELDFOIL - Belden Wire and Cable
BELGARD - Aqualarm
BELLING LEE - Ercona
BEL-RINGER - Bell, Floyd
BELT-LINE - U.S. Terminals
BEMCOIL - Bemco
BENCHMASTER - Tenney Engineering
BENDER - Fancort Industries
BEND/FLEX - Rogers
BERGCON - DuPont Electronics
BERGPIN - DuPont Electronics
BERGPOST - DuPont Electronics
BERGSTIK - DuPont Electronics
BERYLCO - NGK Berylco
BESPONDER - Vega Precision Labs.
BETA-KIT - Contact East
BI-CAP - Dielectric Labs.
BICEMOS - Integrated Device Technology
BICROFLEX - Bicron Electronics
BICRONITE - Bicron Electronics
BIFIFO - Integrated Device Technology
BIG INCH - Haydon Switch & Instrument
BIMORPH - Vernitron Piezoelectric
BINAVERTER - Metric Systems
BIOCHEMGARD - Baker
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BIOGARD - Baker
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BISYN - Unitrode
BIT GUARD - AVX Corporation
BIT LITE - Belden Wire and Cable
BIT-P - United Transformer : of Opt Industries
BITRAC - Transducer Systems
BI-TRIM - American Technical Ceramics Corporation
BLACK BEAUTY - Sprague Electric
BLAK-RAY - UVP
BLENDMASTER - Hull
BLEND-OHM - Methode Electronics
BLOCK PAC - Powercube
BLO-HARD - Heat System
BLOW-GLOW - FIC
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BLUE MAX - International Instrumentation
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BLUE PRINT - CTSI International
BLUE SHOWER - Tech Spray
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BLUE STUFF - Tech Spray
BLUE WIZ - CTSI International
BOARD MAKER - Instant Board Circuits Grp.
BOARD PLATER - Instant Board Circuits Grp.
BOE - General Chemical Corporation
BOMB-TAIL - AMP
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BONDALUM - Craig Systems
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BORD PAK - Buckeye Stamping
BOSTFLEX - BIW Cable Systems
BOSTGARD - BIW Cable Systems
BOSTRAD - BIW Cable Systems
BOSUN - General Instrument
BOX-MOUNT - Hollingsead International
BOX-PAC - Elfab Corporation
BRADYCODE - Brady, W. H.
BRADYMARKER XC - Brady, W. H.
BRADYWRITER III - Brady, W. H.
BRAKE-PAK - Ambi-Tech Inds.
BREVEL - Howard Industries
BRIBBON - Brim Electronics
BRIDGESENSOR - Calex Mfg.
BRIFLON - Brim Electronics
BRIMCROM - Brim Electronics
BRIMFLEX - Brim Electronics
BRIMFLYX - Brim Electronics
BRIMGARD - Brim Electronics
BRIMITY - Brim Electronics
BRIMLITE - Brim Electronics
BRIMLON - Brim Electronics
BRIMPRENE - Brim Electronics
BRITE-EYE - Shelly Associates
BRONCO - Teledyne Thermatics
BROWN DEVIL - Ohmite Manufacturing
BRYON - Brim Electronics
BUBBL-BOARD - Bubbl-Tec
BUBBL-MACHINE - Bubbl-Tec
BUBBL-PAC - Bubbl-Tec
BUCHANAN - Amerace Corporation
BUFFALO - Motorola Semiconductor Prods.
BUG BOX - International Instrumentation
BUG CAGE - International Instrumentation
BUG CATCHER - Emulation Technology
BUG TAG - International Instrumentation
BUG TRAY - International Instrumentation
BULLET-NOSE - ITT Sealectro
BULLET-PROOF - Motorola Semiconductor Prods.
BULLS-EYE - Hughes Aircraft
BURCOM - Applied Information Systems
BUSINESSMATE - NEC Information Systems
BUS TAP - Elcon Products International
BUTTERFLY - ITW Switches
BUTTONEER - Dennison Mfg.
BYTE BUCKET - Analog & Digital Peripherals, (ADPI)
CABELABEL - Datak
CABLEMASTER - Chatsworth Data Corporation
CABLE-RAP - Amrad & Transcon Mfg.
CACHERAM - Integrated Device Technology
CACHETAPE - Cipher Data Prods.
CADAPPLE - Versacad Corporation
CADNICA - Sanyo Energy
CADON - Monsanto
CAGE KEEPER - International Instrumentation
CALCART - Ballantine Laboratories
CALL-TAPER - Electro Physics
CAMAC - Kinetic Systems
CANOLITE - Manhattan Electric Cable Corporation
CANOLON - Manhattan Electric Cable Corporation
CAP BUS - Eldre Corporation
CAPLET - Augat/Pylon
CAP-RANGER - Ohmite Manufacturing
CAPSTICK - ITW Paktron
CAPSTRATE - Sprague Electric
CARBOFLOW - Microwave Filter
CARDCON - Cinch Connector
CARDGARD - Airpax , Cambridge
CARD-O-PULL - Bivar
C*ARDS - Systems Data
CAREFREE - Eagle-Picher
CARFIL - Elastomeric Technologies
CASE MATE - Diversified Case
CASP - Christie Electric
CATHORAD - Judd Wire
CAVITENNA - Amplifier Research
CB-MATE - Bird Electronic
C-BOX - IET Labs
C-CON - Concept Industries
CC-TRON - Bussmann:Cooper Industries
CEBRA 286 - Colorgraphic Communications
CECO - Magnetic Component Engineering
CE-CON - EBY
CELLECTION - Electrochem Industries
CELLULINE - Belden Wire and Cable
CELSIDOT - Solder Absorbing Technology (SAT)
CELSIMETER - Solder Absorbing Technology (SAT)
CELSIPOINT - Solder Absorbing Technology (SAT)
CELSISTRIP - Solder Absorbing Technology (SAT)
CENTAURI - International Machine & Tool
CENTIGRID - Teledyne Relays
CENTI-LOC - ITT Cannon:Military/Aerospace
CENTREX - Monsanto
CEN-TRI-CORE - Alpha Metals
CENTRISAFE - Trio-Tech International
CENTRY - Leeds & Northrup, General Signal
CENTUM - Yokogawa of America
CENTURION - Lutron Electronics
CERACIRCUIT - Sprague Electric
CERACLAD - PCK Technology
CERADOT - CTS Corporation
CERAFIL - Murata Manufacturing , Ltd.
CERALAM - AVX Corporation
CERALOCK - Murata Manufacturing , Ltd.
CERAMABOND - Aremco Products
CERAMACAST - Aremco Products
CERAMACOAT - Aremco Products
CERAMA-DIP - Aremco Products
CERAMIPEC - Murata Manufacturing , Ltd.
CERAMIPHONE - Murata Manufacturing , Ltd.
CERAMITONE - Murata Manufacturing , Ltd.
CERAMO - Thermo Electric
CERAMOCOUPLE - Thermo Electric
CERASEAL - AVX Corporation
CERASTAT - Murata Manufacturing , Ltd.
CERATRIM - CTS Corporation
CERA-TRIM - Johanson Manufacturing Corporation
CERATRON - Murata Manufacturing , Ltd.
CERMAX - ILC Technology
CEROL - AVX Corporation
CERTACELL - Koep Precision Standards
CERTAVOLT - Koep Precision Standards
CER-T-FIED - Berg, W. M.
CERTI-CRIMP - AMP
CERTI-LOK - AMP
CERTI-SEAL - AMP
CETRON - Richardson Electronics, Ltd.
C-GRID - MOLEX
C-GRID SL - MOLEX
CHALLENGER - Equipto Electronics
CHAMP - AMP
CHAMPION SERIES - Analogic
CHAMP-LOK - AMP
CHAMPOMATIC - AMP
CHAN-L-WIRE - The Wiremold
CHANNELITE - Channel Industries
CHANNELIZER - Sencore
CHANNELTRON - Galileo Electro-Optics
CHARABAND - Dataproducts Corporation
CHARGE-GUARD - Static Control Systems/3M Electrical
CHARGE-MASTER - Simco
CHASE-FOSTER - Flexible Technologies
CHASSIS-TRAK - General Devices
CHASSIS-TRAN - EWC

CHECK-LITE - Adalet-PLM Div
CHEMINAX - Raychem
CHEMOLY - Chemtronics
CHEM-O-SOL - Whittaker
CHEM-O-THANE - Whittaker
CHEMTRON - Cosar Corporation
CHEM-WIK - Chemtronics
CHIPAK - Burndy Corporation
CHO-BOND - Chomerics, :W.R. Grace
CHO-CELL - Chomerics, :W.R. Grace
CHO-DROP - Chomerics, :W.R. Grace
CHO-FLEX - Chomerics, :W.R. Grace
CHO-FOIL - Chomerics, :W.R. Grace
CHO-JAC - Chomerics, :W.R. Grace
CHO-MASK - Chomerics, :W.R. Grace
CHO-NECTOR - Chomerics, :W.R. Grace
CHO-SEAL - Chomerics, :W.R. Grace
CHO-SHIELD - Chomerics, :W.R. Grace
CHO-SHRINK - Chomerics, :W.R. Grace
CHO-SIL - Chomerics, :W.R. Grace
CHO-SORB - Chomerics, :W.R. Grace
CHO-STRAP - Chomerics, :W.R. Grace
CHO-THERM - Chomerics, :W.R. Grace
CHROMAGOLD - Zenith Components Group
CHROMA-LINE - Simpson Electric
CHROMATO-VUE - UVP
CHROM-O-SCOPE - Capintec Instruments
CHRONO-LUME - Chrono-log
CHRONO-PAR - Chrono-log
CHRONOTROL - Barber-Colman
CIFLEX - CICOIL CORP.
CIMPLE - Syscon Intl.
CINCH - Hancock Electronics
CINCHNET - Hancock Electronics
CINCH PAC - Hancock Electronics
CIRCBORD - Vector Electronic
CIRC-O-GIDE - Bivar
CIRCUIT CEEZ - Lancer Chemical
CIRCUITIP - AMP
CIRCUITMATE - Beckman Industrial
CIRCUITRIM - Vernitron
CIRKITBLOCK - Powercube
CIRTRAK - DuPont de Nemours, E. I.
CLASPCON - MOLEX
CLASSETTE - Audiotronics
CLASSY CHASSIS - Gimix
CLASS 10 - General Chemical Corporation
CLEANLINE - Controlled Environmental Equipment
CLEAN-N-DRI - Clean Room Prods.
CLEAN PAL - Clean Room Prods.
CLEAN SOUND - Recoton
CLEAR-ALL - Nu-Concept Systems
CLEARFLEX - Carol Cable
CLEAR-PASS - Sprague Electric
CLEERTREND - Leeds & Northrup, General Signal
CLETALOY - Superior Carbon Products
CLIP-AC - Adtech Power
CLIPLITE - Visual Communications
CLIPSLEEVES - Brady, W. H.
C-LITES - Genisco Technology
CLOVER - Hollingsead International
CLUZ - FIC
CMDS - Paso Sound Products
COAXICLAMP - AMP
COAXICON - AMP
COAXITUBE - Precision Tube
COAXWITCH - Bird Electronic
CODEAMP - Codenoll Technology
CODEBEAM - Codenoll Technology
CODEDATA - Codenoll Technology
CODELED - Codenoll Technology
CODELINK - Codenoll Technology
CODELOGIC - Codenoll Technology
CODESTAR - Codenoll Technology
COHRLASTIC - CHR Industries
COIL-FIX - Tra-Con
COLOR * CAL - GM Nameplate
COLOR CAPTURE - Data Translation
COLOR KIT - Data Translation
COLORMASTER - Lance Industries
COMBO-RAK - Fancort Industries
COMBO-SLIDE - Fancort Industries
COMBO-STRIP - Chomerics, :W.R. Grace
COMCAB - COMCAB
COMFORM I - Pace
COMLINE - Piezo Technology
COMMUNITEL - Bogen Communications
COMPAC - Semtech
COMPAC LENS - Vicon Industries
COMPAC LINE - Vicon Industries
COMPARASCOPE - Vision Engineering
COMPLIMITER - Spectra Sonics
COMPLOT - Houston Instrument
COMPONICS - Surgeonics Limited
COM-PREP 838 - Pressure Controls
COMPROTENN - Tenney Engineering
COMPUCOM - Paso Sound Products
COMPUFONE - Computalker
COMPULIFT - Litton Potentiometer
COMPULYTIC - Sprague Electric
COMPUSCOPE - Gage Applied Sciences
COMPUSEIS - Kinemetrics/Systems
COMPUSTAT - PSG Inds.
COMPUTACH - Sensor
COMPUTAMITE - Cornell-Dubilier Elctrns./Sangamo Comps.
COMPUTERBUS - Burndy Corporation
COMPUTERSCOPE - R. C. Electronics
COMPUTEST - Ballantine Laboratories
COMPUTRAK - Gulton Graphic Instruments
COMSHEL - Sinclair Radio Laboratories Ltd.
COMTRAK - EG & G Flow Technology
CONACURE - Conap
CONAP - Conap
CONAPOXY - Conap
CONATHANE - Conap
CONCENTRIKIT - CTS Corporation
CONCIERGE - Audichron
CONCO-FOAM - Consolidated Electronic Wire & Cable
CODENET - Codenoll Technology
CONDUCTA-COTE - Thermalloy
CONDUCTROX - Ferro Corporation
CONDUCTWEEZ - Pace
CO-NETIC - Magnetic Shield Corporation
CONFIDENCER MICROPHONE - Roanwell
CONHEX - ITT Sealectro
CONMAX - Tecknit (Eastern Facility)
CONNECT - Monolithic Sys.
CONSIL - Tecknit (Eastern Facility)
CONSOCARD - Consolink
CONSTAC - Lorain Products
CONTACT-SERT - Hybricon Corporation
CONTINUAC - Lortec Power Systems
CONTROFLEX - Tapeswitch of America
CONTROFLUXER - Adtech Power
CONVERTEMP - EDL
CONVEYOR-CURE - American Ultraviolet
CONXRITE - Visual Communications
COOLANOL - Monsanto
COOL GLO - Bishop Graphics
COPALUM - AMP
COPLAMOS - Standard Microsystems
COPPERPLY - National-Standard
COPPERTHERM - Flexible Technologies
COPY CARV - Miller Dial
COPYCORDER - Hecon
CORELOCKED JACK - Optical Cable
COREMOUNT - Hallmark Metals
CORFLEX - Canada Wire and Cable Limited
CORGUIDE - Corning Glass Works
CORNER-MATE - Hardigg Inds.
CORRIB - Ohmite Manufacturing
COUNTOMATIC - Electromatic Controls
COUNTROLLER - Veeder-Root
COUTANT - Coutant Electronics Limited
COVER CRAFT - Amherst International
COVEROHM - Ferro Corporation
COVERT - Cooper Tools
C-PROBE - International Instrumentation
CRAMOLIN - Caig Labs.
CRANEGARD - Dillon, W. C.
CREDENZA - Lutron Electronics
CRICKET - Sencore
CRIMP-ACON - Methode Electronics
CROMA - Advance Wire & Cable
CROMIT - ULVAC North America Corporation
CROMIX - Dynatech Computer
CROSSOVER - Middleberg Corporation/Middco Connectors
CROWN - Elcon Products International
CRT-PAC - Semtech
CRYOTERM - Maury Microwave
CRYPTO SERVER - ACS Communications Systems
CRYTALBOND - Aremco Products
C-THRU - American Automation
CUBATH - Sel-Rex
CUBELITE - Visual Communications
CUPAC - Semtech
CURASTAT - Herbert Prods.
CURCUIT FIX - Datak
CURRENT GUN - Bell, F. W.
CUSR - Tri-Mag
CUTBEND - ELVO: of Zumbach Electronics Corporation
CYCLEASE - Ram Chemicals, Whittaker
CYCL-FLEX - Eagle Signal Controls:A Mark IV Inds.
CYCLON - Gates Energy Products
CYCLOTAR - Alan Gordon Entprs.
CYCOM MCG FIBER - American Cyanamid
CYLINDICATOR - Namco Controls
DAC PORT - Analog Devices
DAFLEX - Daburn Electronics & Cable
DAFLON - Daburn Electronics & Cable
DAG - Acheson Colloids
DAGLAS - Phelps Dodge Magnet Wire
DAKA WARE - Davies, Harry, Molding
DALITE - Daburn Electronics & Cable
DANAMETER - Racal-Dana Instrs.
DANYON - Daburn Electronics & Cable
DAPEX - Rogers
DAPRENE - Daburn Electronics & Cable
DASH - Astro-Med
DASH-ABEL - Data I/O
DASOFT-PC - Dasoft Design Systems
DATABON - Canada Wire and Cable Limited
DATA-BOY - Mimic
DATABS - Brady, W. H.
DATACOLLECTOR - Digital Products
DATACRYPTOR - Racal-Milgo
DATA DESIGNER - KnowledgeWare
DATAGARD - SL Waber
DATAGUARD - Control Module
DATAKOAT - Datak
DATALENE - Belden Wire and Cable
DATALITE - Dialight
DATA-MATE - Weed Instrument
DATAMITE - Thermo Electric
DATANETWORK - Honeywell Information Systems
DATA PLOT - B-G Instruments
DATA PORTER - ADE
DATARIBBON - Dataproducts Corporation
DATASEEKER - Dataprobe
DATASEIS - Kinemetrics/Systems
DATASERIES - Canada Wire and Cable Limited
DATASWITCH - Wheelock
DATATAB - ALTEK Corporation
DATATAKER - ZI-TECH Instrument
DATA TORK - GSE
DATATRANS - Canada Wire and Cable Limited
DATA-TRAP - Spectral Dynamics
DATAWATCH - Metrix Instrument
DAYMAX - ILC Technology
DAYSTAR - IEE (Industrial Electronic Engineers)
DAYSTAR NOVA - IEE (Industrial Electronic Engineers)
DAZORB - General Semiconductor Ind.
DBUG 88 - Ziatech
DEAP - Fujitsu Microelectronics
DECAP - Dynaloy
DECATRAN - Amprobe Instrument
DECI-CENTER - Aries Electronics
DECI-FLEX - Aries Electronics
DEC-RANGER - Ohmite Manufacturing
DEEP TRACE - American Automation
DEFLECTRON - CELCO
DEKABOX - Electro Scientific Industries, (ESI)
DEKADIAL - Electro Scientific Industries, (ESI)
DEKAPACITOR - Electro Scientific Industries, (ESI)
DEKASTAT - Electro Scientific Industries, (ESI)
DEKAVIDER - Electro Scientific Industries, (ESI)
DEKTAK - Sloan Technology Corporation
DELMICA - Del Elctrns.
DELTAFILM - Sprague Electric
DELTA-KIT - Contact East
DELTA SHEAR - Bruel & Kjaer Instrs.
DELTRAN - Motion Control Group
DEMOD - General Magnetics
DENFLEX - Dennis Chemical
DENSI - Lektra Service
DENSITROL - Princo Instruments
DEPEND-A-BOND - Alpha Metals
DEPENDAC - Lortec Power Systems
DESCO - Dietz Design
DESIGNER'S - Motorola Semiconductor Prods.
DESK MATE - Electronic Solutions
DETECTAVERSE - Magnum Opus Custom Elctrn. Engrg.
DIAL-A-GAIN - Unholtz-Dickie
DIAL-A-LIMIT - Astrosystems
DIAL-A-SPEED - Plant Specialties
DIALATCH - Hartwell
DIAL-A-TEMP - Hexacon Electric
DIALOG - Acurex /Autodata
DIALTEMP - Omega Engineering
DIAMFILE - Jonard Industries
DIAMOND GRIP - AMP
DIAZO-JET - Teledyne Rotolite
DI-CAP - Dielectric Labs.
DIFILM - Sprague Electric
DIGIBEZEL - NOBEX
DIGI-CAL - Analogic
DIGICHEK - Applied Controls
DIGICOUNT - Itek Encoder
DIGIDECADE - Digitran
DIGIDIAL - Beckman Industrial
DIGIFEEDER - IVEK
DIGI-KLIPS - Components
DIGILEVER - Digitran
DIGILINE - Itek Encoder
DIGI-LITES - Lumex Opto/Comps.
DIGILOGGER - NES, (Nationwide Electronic Systems)
DIGIMATIC - Amprobe Instrument
DIGIMITE - Thermo Electric
DIGI-PLATE - Kraft Dynatronix
DIGIPOT - Digitran
DIGISCALE - Itek Encoder
DIGISEC - Itek Encoder
DIGISEIS - Kinemetrics/Systems
DIGI-SHAFT - Computer Conversions
DIGI-SNAP - Sperry, A. W. Instruments
DIGISPENSE - IVEK
DIGI-STRAIN - Helm Instrument
DIGISTROBE - Ametek
DIGISWITCH - Digitran
DIGITENN - Tenney Engineering
DIGITRAC - Transducer Systems
DIGITRAK - EDO Western
DIGITRONIC - Despatch Industries
DIGIVIDER - Digitran
DILPAK - Burndy Corporation
DI-MIC - Dielectric Labs.
DIMMIC - Motorola Semiconductor Prods.
DIM-N-GLO - Lutron Electronics

D/IMUX - Coastcom
DIODE-LITE - Dialight
DIP-A-DIP - Micro Electronic Systems
DIPATCH - Aries Electronics
DIP BITE - Minelco - A Talley Ind.
DIP-C - Grayhill
DIP GRIP - Pomona Electronics
DIP GUARD - AVX Corporation
DIPLOMATE - AMP
DIPMATE - Burndy Corporation
DIP-PAK - Fidelity Chemical Products
DIPSERT - Mann, Henry
DIPSTIK - Stanford Applied Engrg.
DIRECTRON - Sanford-Miller
DIRECTWELD - ITT-Higbie Mfg.
DISCAN - Antenna Specialists
DISCO - Panduit
DISS-O-PAD - Bivar
DISTEC - Helm Instrument
DISTIK - Stanford Applied Engrg.
DI-T - United Transformer : of Opt Industries
DITRAN - EMCA/ROHM & HAAS
DITRONIC - RAYOVAC Corporation
DIVERSIPHASE - Shure Brothers
DIVIDOHM - Ohmite Manufacturing
DIVIMASTER - International Machine & Tool
DIVITRON - International Machine & Tool
DLRO LOW RESISTANCE OHMMETERS - Biddle Instruments
DOCUFAX - Alden Electronics
DOCUTEMP - Metrosonics
DOLFLEX - Dolph, John C.
DOLPHON - Dolph, John C.
DOORMAN - Speco
DORIS - Sprague Electric
DO-T - United Transformer : of Opt Industries
DOT-X - Dotronix
DOUBLE-DIP - Grayhill
DOUBLE-SEAL - Jamesbury
DOUBL-GARD - Southco
DOVTREX - Gandalf Data
DRAGON - Okonite
DRIFT-LOCK FLUXMETER - Walker Scientific
DRILLDIRECTOR - Humphrey
DROSS-X - Multicore Solders
DRUMSTICK - Gems Sensors
DRY-BLEND NCG FIBER - American Cyanamid
DRYFIT - Sonnenschein Batteries
D-SODR SYSTEMS - Pace
DT/IDL - Data Translation
D-TROL - Electrol
DUALATCH - AMP
DUALAY - Okonite
DUAL FLEX - Standard Grigsby
DUAL-SHORE - ITT Cannon:Military/Aerospace
DUAL-SHRINK - Zeus Indl. Prods.
DUNCO - Struthers-Dunn Military Relays
DUODIAL - Beckman Industrial
DUOFOIL - Belden Wire and Cable
DUOSIL - Tecknit (Eastern Facility)
DUOTRONIC - Edwards
DUO-TYNE - AMP
DUO-VAC - Lab-Line Instruments
DUOWATT - Motorola Semiconductor Prods.
DUPLINE - Electromatic Controls
DURACOLOR - Carol Cable
DURA-DRY - FTS Systems
DURA-FLEX - Antenna Specialists
DURA FLO - Kurz Instruments
DURAFOAM - Carol Cable
DURA-LAY - International Wire Products
DURALCO - Cotronics
DURANT - Eaton Corp
DURAPOT - Astrosystems
DURA-STRAND - International Wire Products
DURATHERM - BIW Cable Systems
DUREX - PMI Motion Technologies
DUROTHERM - Hexacon Electric
DUR-X-THANE - Whitmor Wire & Cable
DUST MAGNET - Clean Room Prods.
DYAD - C.P. Clare
DYKANOL - Cornell-Dubilier Elctrns./Sangamo Comps.
DYMAC - Spectral Dynamics
DYNAC - Dynisco
DYNACEL - Exide Corporation
DYNACLAD - Exide Corporation
DYNA-CORE - Alpha Metals
DYNA-CRIMP - AMP
DYNADISC - Portescap U.S.
DYNADRIVE - Portescap U.S.
DYNAFLUX - Todd Products
DYNA-JET - B & K Precision
DYNALOAD - Transistor Devices
DYNAMASTER - Bristol Babcock
DYNAMAX - Alan Gordon Entprs.
DYNA-MITE - LH Research
DYN/AMP - Halmar Electronics
DYNA-PEAK - B & K Precision
DYNAPHASE - Stanton Magnetics
DYNAPOUR - Ajax Magnethermic
DYNAPULSE - Kraft Dynatronix
DYNASOAP - Heat System
DYNASOLVE - Dynaloy
DYNA SOURCE - EG&G Geometrics
DYNASTY - Johnson Controls
DYNA-SWITCH - Dillon, W. C.
DYNATACH - Electric Tachometer
DYNATALK - Dynatech Computer Power
DYNA-TEMP - EDL
DYNATIME - Electrodynamics
DYNATRAC - ITHACO
DYNATROL - Automation Prods.
DYNATRON - International Machine & Tool
DYNAYOKE - CELCO
DYNETIC - Shure Brothers
EARSPLITTER - Kolin Inds.
EASI-DISK - Analog & Digital Peripherals, (ADPI)
EASYENTRY - Applied Information Systems
EASYMATCH - Alford Manufacturing
EASY-METER - Sperry, A. W. Instruments
EASY PEEL - BRIntec
EASYPOXY - Conap
EB-CON - EBY
E-BUS - E-Systems
ECOALUBE - E/M Corporation
ECONO-BEAM - Banner Engineering
ECONOCAP - Motorola Semiconductor Prods.
ECONOCODER - Astrosystems
ECONODIN - Teka Interconnection Systems
ECONOFIRE - EMCA/ROHM & HAAS
ECON-O-GIDE - Bivar
ECONO-HEAT - Aremco Products
ECONO JET - Teledyne Rotolite
ECONO-LAP - Accumet Engineering
ECONOMATE - AMP
ECONOMITE - ITW Switches
ECONO-POLISH - Accumet Engineering
ECONOPOT - Robert Shaw Instrument
ECON-O-TEMP - Barksdale Controls
ECONO ZIP - 3M-Electronic Products
EDGEGARD HOOD - Baker
EDGE-ON - Burndy Corporation
EDGE-PAC - Elfab Corporation
EDGE-TITE - Burndy Corporation
EDGEWEDGE - Lamptronix , Ltd.
EE DESIGNER I - Visionics Corporation
E-FETS - Motorola Semiconductor Prods.
EISABUS - Burndy Corporation
EJECT-A-DIP - Aries Electronics
EKLP - High Technology Sensors
E-KOTE - Acme
ELASTO-FLEX II - Craig Systems
ELASTOFOAM - Tecknit (Eastern Facility)
ELASTOMET - Tecknit (Eastern Facility)
ELCOM - PITTMAN
ELECPAC - Wilbrecht Electronics
ELECTOTUNE - Paso Sound Products
ELECTRA - IEE (Industrial Electronic Engineers)
ELECTRICORD - Pacific Electricord
ELECTRIX - Patton-MacGuyer
ELECTRLOY - Molecu-Wire
ELECTROCOM - Electrocom Industries
ELECTRODAG - Acheson Colloids
ELECTROLAB - LJ Technical Systems
ELECTRO-LAP - Okonite
ELECTROLERT - Leeds & Northrup, General Signal
ELECTROMAX - Leeds & Northrup, General Signal
ELECTRONIC POWER CENTER - Dynatech Computer Power
ELECTRO-PAC - Instrumentation & Control Sys.
ELECTRO-PROBE - Sperry, A. W. Instruments
ELECTRO-TAP - AMP
ELECTRO-WASH - Chemtronics
ELINA - Indek Corporation
ELINCO - Electric Indicator
ELMET - Philips Elmet
ELNIKORD - IPM
ELPH - Thermo Electric
ELTRON - International Machine & Tool
ELVOX - Paso Sound Products
EMIFIL - Murata Manufacturing , Ltd.
EMI-X - LNP Engineering Plastics
EMRALON - Acheson Colloids
EMULYZER - HILEVEL Technology
ENCLOZ - Fastex
ENDSULATOR - Unadilla Antenna Mfg.
ENDUR - Rogers
ENERCON - Amerace Corporation
ENERGEX - Canada Wire and Cable Limited
ENERGIZED - Alpha Metals
ENERGIZER - Eveready Battery
ENERGY-MISER - Kalglo Elctrns.
ENERGY-SAVER - Westinghouse Electric
ENERSCAN - Despatch Industries
ENGEL - Micro Mo Electronics
ENTITY RECOGNITION - Audre
ENVEX - Rogers
ENVIRONETTE - Lab-Line Instruments
ENVIRONOL - Aerovox
ENVIRO-SKAN - Skan-A-Matic
ENVIROSTAT - Simco
ENVIRO-SWITCH - Giannini Institute
E-PAC - Instrumentation & Control Sys.
EPIBASE - Motorola Semiconductor Prods.
EPICAP - Motorola Semiconductor Prods.
EPION - Solid State Devices
EPITRAN - Solid State Devices
EPLATRONICS - Epsilon-Lambda Elctrns.
EPOCAP - Hardman
EPOCH - Multi-Amp
EPOCRETE - Hardman
EPOCURE - Hardman
EPOSET - Hardman
EPOSOLVE - Hardman
EPO-TEK - Epoxy Technology
EPOWELD - Hardman
EPOXYCAST - ISOREG
EPOXYLITE - Epoxylite
EPSON - Epson America, /OEM
EPTAK - Eagle Signal Controls:A Mark IV Inds.
E-QUALIDYNE - Shure Brothers
EQUITY - EG & G Flow Technology
ERDAC - Macrodyne
ERGO KEY - Advanced Input Devices
ERSA - Caig Labs.
ESCAP - Portescap U.S.
ESEMAR - Regency Land Mobile
E/SERIES - Timeplex
ESICO - ESICO/TRITON
E-SOLDER - Acme
ESSEX - United Technologies Control Systems
ESTRALON - Polymer
ETERNACELL MDX - Power Conversion
EVA - Kurz Instruments
EVERFAST - Ambroid
EVERLASE - Coherent General
EVERLUBE - E/M Corporation
EVERMARK - Coherent General
EVERMATIC - Coherent
EVERMIX - Coherent
EVERPULSE - Coherent General
EVERSCRIBE - Coherent
EVERSHIELD - E/M Corporation
EVER SLIDE - Finishers
EVERSTRIP - Coherent
EVERTRIM - Coherent
EXAKTA - Ercona
EXCALIBER - Sinclair Radio Laboratories Ltd.
EXCALIBUR - Illinois Lock
EXCEL - Honeywell
EXCELIX - Excel Technology Intl.
EXCELTA - Excelta Corporation
EXMOS - Powerex
EXPAND-A-RAK - Love Controls
EXTRALITE CASES - Diversified Case
EXTRALYTIC - Sprague Electric
EXTRUSOL - Multicore Solders
EYRING-CREATING SOLUTIONS - Eyring Research Inst.
E-Z CIRCUIT - Bishop Graphics
EZ-CONTROL - Molytek
E-Z COUNT - EDL
EZE-IMAGE - Fitchburg Coated Products
E-Z-ENTRY - Berg, W. M.
EZE-STIK - Fitchburg Coated Products
EZ INSERTA - Garry Electronics
E-Z-JECT - Scanbe
EZ-NET - LTX
EZ-PRO - American Automation
E-Z PROBE - EDL
E-Z-READER - PERCON (Peripheral Connections,)
E-Z SHOT - Branden, T. G.
EZSTEP - Step Engineering
E-Z-TRIM - Bourns
FAIRLOC - Sterling Instruments
FALLBACKER - Dataprobe
FALT TRAP - Gould Shawmut
FANDIAL - Lutron Electronics
FAN PAK - Unitrack Industries
FAS'N-IT - Ambroid
FASTAIRE - Humphrey
FASTEMP - Amprobe Instrument
FAST FIT - Cambridge Products
FASTIN-FASTON - AMP
FASTITE - Everett/Charles Contact Products
FASTON - AMP
FASTPAK - Teccor Electronics
FASTRACK - Harris Semiconductor
FASTRAK - Gandalf Data
FAULHABER - Micro Mo Electronics
FAULTFINDER - Wiltron
FAXGARD - Sutton Designs
FAX-LINE - Perma Power Elctrns.
FAXMATE - Alden Electronics
FENICULOY - Molecu-Wire
FERRAMIC - Allen-Bradley , Magnetics
FERRETRAC - Ferretec
FERREX - ACD-Elcor Products
FERRINOX - Thomson Passive Components
FERROFLO - Ferro Corporation
FERROPOWR - Rapid Power Technologies
FERROREG - Rapid Power Technologies
FERROSORB - Microwave Filter
FERROTITE - Murata Manufacturing , Ltd.
FERRUPS - Best Power Technology
FETMOD - Powerex
FIBERFLEX - CICOIL CORP.

FIBERLAB - Math
FIBERLINK - Math
FIBER-LITE - Dolan-Jenner Inds.
FIBER MASTER - L & L Special Furnace
FIBERVISION - Math
FIBER-VUE - Cambridge Instruments
FIBREYE - Galileo Electro-Optics
FIELD COMMANDER - Solid State Systems
FIELDMOUSE - MSC Technologies
FIELD-PRO - Amherst International
FILMATIC - ITW Paktron
FILMBRID - Merrimac Industries
FILMO - Alan Gordon Entprs.
FILMTRIM - Sprague-Goodman Elctrns.
FINAL AIR - Aluminum Filter
FINAL KOTE - Tech Spray
FINGER-PAC - Elfab Corporation
FINGRIP - Burndy Corporation
FIN-PAC - Semtech
FIREFLY - Dupree
FIREX II - Canada Wire and Cable Limited
FIRON - EMCA/ROHM & HAAS
FIRST - Motorola Semiconductor Prods.
FLAME-EYE - Barber-Colman
FLAMEOTROL - Barber-Colman
FLAMON - Bailey Controls
FLASHBLAST - Maxwell Laboratories
FLASH CUTTER - Ewald Instruments
FLASH STRIPPER - Ewald Instruments
FLAT-HEAD - Signal Transformer
FLATSO - KDI/Triangle Electronics
FLATSTACK - Microtran
FLEX/EL - GM Nameplate
FLEXAGUIDE - Airtron
FLEXCON - Air-O-Tronics
FLEX-E-BELT - Berg, W. M.
FLEX-E-GEAR - Berg, W. M.
FLEX-E-GRIP - Berg, W. M.
FLEX-E-PITCH - Berg, W. M.
FLEX-FIT - Thomas & Betts Corporation
FLEXFOAM - Carol Cable
FLEXFOIL - Carol Cable
FLEXI-BLOCK - AMP
FLEXI-COOL - FTS Systems
FLEXI-DRY - FTS Systems
FLEXI-GLOVE - Clean Room Prods.
FLEXISHIFT - Integrated Device Technology
FLEXITE - Markel
FLEXI-WEAVE - BRIntec
FLEXLEAD - Markel
FLEX-LOCK - Namco Controls
FLEXLOK - Burndy Corporation
FLEXOLON - Tensolite
FLEXOPULSE - Eagle Signal Controls:A Mark IV Inds.
FLEXPAC - Thomas & Betts Corporation
FLEXRAD - Judd Wire
FLEXSWITCH - Sheldahl
FLEXTAC - Hypertronics
FLEXTENSION - Tech Spray
FLEX-THANE - Berg, W. M.
FLEXTIME - Hecon
FLEXVYN - Tensolite
FLEXY-MARKER - Datak
FLOCELL - Heat System
FLOPPY COPPY - Applied Data Communications
FLO-RITE - Kester Solder
FLOTRAC - Hull
FLOTROL - Lorain Products
FLUENT/BFC - Creare
FLUITROL - Heat System
FLUOROCOMP - LNP Engineering Plastics
FLUOROMELT - LNP Engineering Plastics
FLUOROSINT - Polymer
FLUORO-XECON - Chomerics, :W.R. Grace
FLUOR-X - Nuclear Research
FLUX-OFF - Chemtronics
FLUX STRIPPER S - Tech Spray
FLYFORWARD - Valor Power Systems
FNC - Hoppecke Battery Systems
FOAMCONE - Teledyne Ryan Electronics
FOCAL - Digital Equip.
FOCEST - Materials Research Corporation
FOMAT - Controlled Environmental Equipment
FONE-A-LERT - Bell, Floyd
FONO-MAGIC - R-Columbia Prods.
FORERUNNER - Data Translation
FORESIGHT - Penn Video
FORGE - Anvil Cases
FORMKOTE - E/M Corporation
FORM-TRAN - EWC
FOTOCERAM - Corning Glass Works
FOTOFET - Teledyne Crystalonics
FOTOFOIL - Miller Dial
FOTOFORM - Corning Glass Works
FOX - E & L Instruments
FREED MEGOHMMETERS - Industrial Test Equipment
FREEZ-IT - Chemtronics
FREON - DuPont de Nemours, E. I.
FRICTION-AIRE - Blue M, A Unit of General Signal
FRIGICHIP - Melcor/Materials Elctrn. Prods.
FRIGITOTE - Melcor/Materials Elctrn. Prods.
FRISKEM - Infinetics
FROST-OFF - Merix Chemical
FULL PAK - Motorola Semiconductor Prods.
FULL-VIEW - Brooks Instrument
FUSECOR - Whitmor Wire & Cable
FUSEPLUG - Arco Electronics
FUSE TEL - Ewald Instruments
FUSETRON - Bussmann:Cooper Industries
FUSIONBRAZED - ITT-Higbie Mfg.
FUSIONWELD - ITT-Higbie Mfg.
FUSTAT - Bussmann:Cooper Industries
FUTURA - Teledyne Rotolite
FUZZ BUTTONS - Tecknit (Eastern Facility)
FYRESTAN - Leeds & Northrup, General Signal
GAGE CALE MODULES - Gage Applied Sciences
GALAXY - Nova Electric
GAMMA - KnowledgeWare
GAMMATROL - Nuclear Research
GAP-CAP - Dielectric Labs.
GAP-SWITCH - K-Two Industries
GARALEASE - Ram Chemicals, Whittaker
GARALYST - Ram Chemicals, Whittaker
GARDSMAN - West Instrument
GAROX - Ram Chemicals, Whittaker
GASK-O-SEAL - Parker Seal Grp.
GATEWAY - Digital Products
GATLIN GUN - Mann, Henry
GECELL - GE Microelectronics Center
GEGATE - GE Microelectronics Center
GEL/CELL - Johnson Controls
GELYTE - SAFT America
GEMFET - Motorola Semiconductor Prods.
GENERATOR - Eveready Battery
GENGUIDE - General Cable
GEOLAST - Monsanto
GEO-MARINE - Glenair
GEOVIEW - Adage
GEPEG - General Elec.
GHOST - Gimix
GIBSON GIRL - Benjamin International
GIFT MATE - Eveready Battery
GIGAFIL - Murata Manufacturing , Ltd.
GIGARAM - Monolithic Sys.
GIGA-TRIMS - Johanson Manufacturing Corporation
GLASGUARD - AVX Corporation
GLO-BOX - L & L Special Furnace
GLOBTEK - Globtek
GLO-DOT - Industrial Devices
GLO-RING - Eraser
GLO-STAT - GTE Sylvania Lighting
GLYDER - Lutron Electronics
GOAT - Craig Systems
GOLD CONNECTION - Recoton
GOLD DOT - Hughes Aircraft
GOLDENPOWER - Baknor Industries
GOLD-FISH - Ideal Industries
GORE-TEX - W. L. Gore
GORE-WRAP - W. L. Gore
GRAB'M QUIK - Brim Electronics
GRAF/BAR - Science Accessories
GRAF/PEN - Science Accessories
GRALAB - Dimco-Gray
GRAND SLAM - Potter Instrument
GRANT - Science/Electronics
GRAPHALLAST - Graphite Metallizing
GRAPHALLOY - Graphite Metallizing
GRAPHI-COAT - Aremco Products
GRAPHIC TRACE - Gould
GRAPHILM - Graphite Metallizing
GRAPHMETEX - Graphite Metallizing
GRAPHOVER 9500 - New Media Graphics
GRASIS - Andrew
GREALSTAR - Intepro Systems
GREENIE - Ideal Industries
GRIDPAK - Andrew
GRID ZIP - 3M-Electronic Products
GRIPLET - DuPont Electronics
GRIP-O-GIDE - Bivar
GRIPRING - Waldes Truarc
GRIPWELL - Hartwell
GRO-LUX - GTE Sylvania Lighting
GROMSTRIP - ICO-RALLY Corporation
GROUND-R-GUIDE - Unitrack Industries
GS EYELETS - Stimpson
GUARDIAN - Tech Spray
GUARD-TEMP - EDL
GUIDELINE - Andrew
GYRO-ACCELEROMETER - Plessey Electronic Systems
GYROSURVEYOR - Humphrey
HALL-PAK - Bell, F. W.
HALLTRON - Ohio Semitronics
HAM-MATE - Bird Electronic
HANDI-GRIP - Ideal Industries
HANDYPIN - Autosplice
HANDYTAB - Autosplice
HARDKOAT - Datak
HARDSET - Hardman
HAROSYN - Harowe Servo Controls, :A Fasco
HART - Nu-Concept Systems
HEAR WELL - Eveready Battery
HEAT GUARD - Hexacon Electric
HEATRAN - Power Designs
HEATRAX - ICO-RALLY Corporation
HEET SPREADER - Opto 22
HEBBAR - Melles Griot
HEJET - Pamran
HELIAX - Andrew
HELI-CAL - Helical Prods.
HELICOP HUT - Craig Systems
HELIPOT - Beckman Industrial
HELITRIM - Beckman Industrial
HELMETER - Helm Instrument
HELM-PAK - Helm Instrument
HELMSMAN - Helm Instrument
HENCOL - Cole Hersee
HEPTAWATT - SGS-THOMSON Microelectronics
HERAWIT - Heraeus
HERCULES - Eveready Battery
HERMETICOOL - Tenney Engineering
HETERO-CAVITY - Security Plastics
HEX-A-CORN - APM-Hexseal
HEXCOLUMNS - Paso Sound Products
HEXFET - International Rectifier
HEXPAK - International Rectifier
HEXSEALS - APM-Hexseal
HEX WIK - Hexacon Electric
HG BRIGHT GOLD - Technic
HIC - Murata Manufacturing , Ltd.
HICAP - Bussmann:Cooper Industries
HI-COAT - Murata Manufacturing , Ltd.
HI-CON - Panduit
HI-COR - Alpha Metals
HI-EX - WALTER KIDDE
HI-FLUX - Arnold Engineering
HIGH DENSITY PLUS - Teradyne Connection Sys.
HIGH-LITE - Schott Glass Technologies
HIGH-MILEAGE - Mann, Henry
HIGH STEPPER - Cyberpak
HI-LIFE - Sprague-Goodman Elctrns.
HI-LUME - Lutron Electronics
HI-MEG - Dolph, John C.
HINIL - Teledyne Semiconductor
HI-P - Barksdale Controls
HIPAD - Houston Instrument
HIPEC - Dow Corning
HIPLOT - Houston Instrument
HIPOTRODE - Hipotronics
HIPPO-CLIP - Mueller Elec.
HI-SCALE - Heyco Molded Products
HITCHHIKER - Alan Gordon Entprs.
HI TENSION - Genisco Memory Prods.
HI-THERM - Dolph, John C.
HIWIRE - Wintek
HOLTITE - Augat
HOMEBASE - Hand Held Products
HONEY BEE - Hurst Manufacturing
HORNET - Hexacon Electric
HOT BOX - L & L Special Furnace
HOT LINE - Warren G-V, Unit of Signal
HOT LIPS - ESICO/TRITON
HOT SPOTZ - Zippertubing
HOT TIP - Contact
HUB-CLAMP - Sterling Instruments
HUB-LOCK - Sterling Instruments
HUMIDOLAIN - Star Porcelain
HUSKY - Clean Room Prods.
HY-A-SIL - Sanford-Miller
HYBRID CARE - Gandalf Data
HYBRIDGE - Alford Manufacturing
HYDENT - Burndy Corporation
HYDRIVE - Infodex
HYDROCHART - General Instrument
HYDROFEED - Components
HYDRO-FLOW - Alpha Metals
HYDROSOLV - Alpha Metals
HYDRO-X - Multicore Solders
HYFEN - Burndy Corporation
HYGRADE - Markel
HYGROLINE - Beckman Industrial
HYJOULE - Associated Research
HYLINK - Burndy Corporation
HYLOK - Burndy Corporation
HYLUG - Burndy Corporation
HYPASS - Sprague Electric
HYPERFORMANCE - Motorola Semiconductor Prods.
HYPERION - Lutron Electronics
HYPOINT - Burndy Corporation
HYPRESS - Burndy Corporation
HYREL - Sprague Electric
HYRING - Burndy Corporation
HY-THERM - Hy-Cal Engineering
ICCON - Elcon Products International
ICCS - Bailey Controls
ICE CUBE - Powercube
ICE PAC - Powercube
ICEPAK - Motorola Semiconductor Prods.
ICSOTIMER - Instrumentation & Control Sys.
IDEACOMM - IDE Associates
IDEADISK - IDE Associates
IDEAGRAPH - IDE Associates
IDEAMAX - IDE Associates
IDEAMINI - IDE Associates
IDEA MINICOMM - IDE Associates
IDEAMINIMAX - IDE Associates
IDEANET - IDE Associates
IDEASHARE - IDE Associates
IDEATAPE - IDE Associates
I-DENT - Telesis Controls
I-DIT - United Transformer : of Opt Industries
I-DOT - United Transformer : of Opt Industries

IGNITOR - Eveready Battery
IMAGECOM - Paso Sound Products
IMAGESCOPE - Galileo Electro-Optics
IMAGEVIEW - Adage
IMCOM - IMC Magnetics
IMCON - Andersen Laboratories
IMCOOL - IMC Magnetics
IMCUBE - IMC Magnetics
IMLEC - Inter-Market
IMMERSION GOLD - Sel-Rex
IMPACT-O-GRAPH - Chatsworth Data Corporation
IMPERVITRAN - Micron Industries
IMPLION - Frequency Sources
IMPRESSION - Eyring Research Inst.
INCA - Kalglo Elctrns.
INCHWORM - Burleigh Instruments
INCONIX - Hancock Electronics
INDAC - Digital Equip.
INDEXMATIC - International Machine & Tool
INDUCT-A-RING - Unholtz-Dickie
INDUSTRITE - BIW Cable Systems
INFI-90 - Bailey Controls
INLINE - Unadilla Antenna Mfg.
INSULGEL - Insulcast
INNOVA - Coherent
INSET - Materials Research Corporation
INSIGHT - Penn Video
INSTALL488 - Ziatech
INSTA-SET - Barber-Colman
INSTA-TEST - Grand Trahsformers
INSUL-BOLT - Augat/Pylon
INSULBOND - Insulcast
INSULCAST - Insulcast
INSUL-COTE - Thermalloy
INSULCURE - Insulcast
INSULET - Augat/Pylon
INSULINK - Burndy Corporation
INSULSPLICE - Autosplice
INSULTEK - IERC
INSULUBE - IERC
INSULUG - Burndy Corporation
INTER-ACCESS - Elcom Industries
INTERCEPTER - Surgeonics Limited
INTERCHECK - Guildline Instruments
INTERCHIP - International Components
INTERFILTER - Unadilla Antenna Mfg.
INTERKIT - International Components
INTERLEAF - ITW Paktron
INTERLITE - Baknor Industries
INTERNALIGN - Bowmar Instrument
INTEROHM - International Components
INTERROSPONDER - Vega Precision Labs.
INTERVOX - International Components
INTER-8 WEAVE - Magnetic Shield Corporation
INTRALUX - Volpi-MFG-USA
INTRASCOPE - Volpi-MFG-USA
INTRASPOT - Vicon Industries
INVERTRON - California Instruments
IOCHROME - Materials Research Corporation
IONEX 2000 - Kester Solder
IONOGRAPH - Alpha Metals
I/O PRO - Integrated Digital Products
IPAC - Instrumentation & Control Sys.
IR EYE - IR Scientific
IRIS - Point 4 Data
IRISCORDER - Hamamatsu Photonics K.K.
IRIS TUTOR - Data Translation
IRONCLAD - Exide Corporation
ISLATRAC - Control Concepts
ISLATRAN - Control Concepts
ISLATROL - Control Concepts
ISLATRON - Control Concepts
ISOBASE - Endevco
ISOCHEMBOND - Furane Products
ISO-CUBE - Teledyne Solid State
ISO-CURVE - Fenwal Electronics/APD
ISODAMP - E-A-R
ISODRIVE - Zehntel
ISOFORMER - ACD-Elcor Products
ISO-GATE - Dionics
ISOGUARD - ISOREG
ISOLENE - Hardman
ISOMUL - Furane Products
ISO-OHM - Ferro Corporation
ISOPAC - Semtech
ISO-PAK - Computer Products
ISOPLY - ACD-Elcor Products
ISOREX - ACD-Elcor Products
ISOSHEAR - Endevco
ISOSHIELD - ISOREG
ISOTAPS - KAPPA/VIZ Test Equipment
ISOTHERM - Victory Engineering
ISOTHERMAL - Motorola Semiconductor Prods.
ISOTRON - Endevco
ISOTRONICS - Isotronics
ISO-VERTER - Love Controls
ITECO - Industrial Test Equipment
ITRON - Noritake
IVONDING - IVO Industries
IVOTAPE - IVO Industries
JANETTE - Eastern Air Devices
JANSET - Jan Hardware Mfg.
JELLY BEANS - Augat/RDI
JETCAL - Howell Instruments
JET-FLECS - MOLEX
JETFLOW - Ajax Magnethermic
JET PLATER - Sel-Rex
JET PORT STOCK - Bailey Controls
JFD - Sprague-Goodman Elctrns.
JIF-TEMP - EDL
JOBMAG - Jobmaster
JOLTA - Jan Hardware Mfg.
JOTDRAFT - Datak
JUPITER - IEE (Industrial Electronic Engineers)
JUST RAM - Monolithic Sys.
JUST-WRAP - OK Industries
KALAR - Hardman
KALENE - Hardman
KALEX - Hardman
KANGAROO - Sencore
KARATCLAD - Sel-Rex
KARD-O-LITE - Bonar Kard-O-Lite
KARI - ZI-TECH Instrument
KARRY-ALL - Fancort Industries
K-BAR - Kurz Instruments
KEEPER II - Eagle-Picher
KELVIN KLAMPS - Electro Scientific Industries, (ESI)
KEMFUZE - Bel Fuse
KEWAUNEE - Kewaunee Scientific
KEYPHASOR - Bently Nevada
KEY SYSTEM - Electromatic Controls
KILOBYTE - Vertex Industries
KILOVOLT STAC - Semtech
KING Q - Vanguard Electronics
KINGSPLICE - Autosplice
KINOPTIK - Heitz, Karl
KLEEN-ALL - Tech Spray
KLEEN LINE - Electronic Specialists
KLEEN-STRIP - National Wire & Cable
KLEENTROL - R-Columbia Prods.
KLIPPON - Weidmuller
KLIPRING - Waldes Truarc
KLIP SELS - International Rectifier
KLIPSOCKET - ITW Switches
KLIXON - Texas Instrs.
KNOBPOT - Bourns
KOLMOLD - PCK Technology
KONEKT-ALL - Jonard Industries
KONFORM - Chemtronics
KOOLER-GUIDE - Unitrack Industries
KORE - Digital Dynamics
KORLESS ELECTRODES - Micro-Coax Components
KRONAGOLD - E/M Corporation
KRONAPLATE - E/M Corporation
KRYTERION - Everett/Charles Test Equipment
K-TROL - Electrol
KV-PAC - Semtech
KWICK-KONNECT - ITT Sealectro
KWIKI - Lightning Protection
KWIK-SNAP - Accurate Electronics
KWIK-TAB - Accurate Electronics
KWIK-TIE - Accurate Electronics
KW PAC - Semtech
KYMORFLEX - Pennwalt
KYNAR - ICO-RALLY Corporation
KYNAR FLEX 2800 - Pennwalt
LABVIEW - National Instruments
LABWINDOWS - National Instruments
LAMPLIGHTER - Cardinal Control
LAMTAC - Hypertronics
LANCE-A-LOCK - Techdyne
LANCELOK - AMP
LAND - Zenith Components Group
LAN-PAC - Reliability
LAPFLO - Pace
LASER GEM - Laser Technology
LASERMATIC - General Laser
LASERNET - Namco Controls
LASERSCRIBE - Quantronix
LASERTABS - Brady, W. H.
LASERTRAC - Coherent
LASER-WAND - Hand Held Products
LASTEC - Laser Technology
LATCH-N-LOK - DuPont Electronics
LAT-CON - Panduit
LAVOLAIN - Star Porcelain
LBA - Syscon Intl.
L-BOX - IET Labs
LC^2 MOS - Analog Devices
LEAD EDGE - Texas Instrs.
LEAD SHUNT - Gordon, L., Packaging
LEAK-PRUF - Alpha Metals
LECTRA-LOAD II - RTE Power/Mate
LECTR-AU-LYTE - Sel-Rex
LECTRODUCT - Lectro Magnetics
LECTROLESS - Sel-Rex
LECTRO LINE - Lectro Magnetics
LECTRO-NIC - Sel-Rex
LECTRONICCOMPASS - Humphrey
LECTRO-PLAQUE - Simco
LECTRO-QUIP - Illinois Lock
LECTROSHIELD - Lectro Magnetics
LECTROVENT - Lectro Magnetics
LEDCO - Wilbrecht Electronics
LEDDICON - EEV
LED-EYE - Shelly Associates
LED-PAK - Dolan-Jenner Inds.
LEEBOND - Leepoxy Plastics
LEECAST - Leepoxy Plastics
LEE-STRIP - Atlee
LEKTRON SERIES - Paso Sound Products
LEPAK - Lepel
LEV CHEK - Hexacon Electric
LEVEL-LOC - Shure Brothers
LEVEL/PAK - Square D
LEVER-LOC - Teledyne Kinetics
LEVOLIER - McGill Manufacturing
LEX 90 - Adage
LGH - AMP
LIFEGARD - Antenna Specialists
LIFELINE - Instrumentation & Control Sys.
LIFEX - RAYOVAC Corporation
LIL ELF - Data-Design Labs.
LIMITRON - Bussmann:Cooper Industries
LINEGARD - SL Waber
LINEMATE - Coherent Communications Sys.
LINE MISER - Gandalf Data
LINE-O-LITE - Industrial Devices
LINE-SAVER - Kalglo Elctrns.
LINE TAMER - Shape Magnetronics
LINISTOR - Keystone Carbon
LINK/CHEK - Com/Tech Systems
LINKéC.488 - Ziatech
LINK/VIEW - Timeplex
LINK 2000 - Gandalf Data
LIN-R-TRAN - Waters Manufacturing
LISTENER - Dataprobe
LITE - United Foam Plastics
LITE-BOND - International Wire Products
LITE LINE - ALTEK Corporation
LITE-MIKE - EG&G
LITHIODE - Catalyst Research
LITHOCON - Princeton Electronic Products
LITTELITES - Littelfuse
LITTLE CAESAR - ITT Cannon:Military/Aerospace
LITTLE DEVIL - Ohmite Manufacturing
LITTLE DIPPER - Techni-Tool
LITTLE GENERAL - Barksdale Controls
LITTLE GRIPPER - Techni-Tool
LITTLE HUEY - Sencore
LITTLE-MITE - LH Research
LITTLE REBEL - Ohmite Manufacturing
LITTL-LYTIC - Sprague Electric
LIXI - Lixi
LOAD BLOCK - Kistler-Morse
LOAD DISC - Kistler-Morse
LOADGARD - Helm Instrument
LOAD LINK - Kistler-Morse
LOAD-PAK - Gems Sensors
LOAD STAND - Kistler-Morse
LOADSTAR - Intepro Systems
LO CAP - Consolidated Electronic Wire & Cable
LOCATE 88 - Ziatech
LOCKIT-SOCKET - U.S. Terminals
LOCK-O-SEAL - Parker Seal Grp.
LOCKWELL - Hartwell
LO-COG - PITTMAN
LOCOST - Julie Research Labs.
LOC-TRAC - Alpha Wire
LO-EX - WALTER KIDDE
LOGCELL - Fifth Dimension
LOGIC II - B & B Motor & Control
LOGO-LITE - Zero
LOK-TAINER - EG & G Birtcher
LO-MITE - Ohmite Manufacturing
LONER - Edsyn
LONGFELLOW - Waters Manufacturing
LONGHAIR - Stanton Magnetics
LONGHOLD - Teradyne Connection Sys.
LONG LIFE - Berg, W. M.
LONG RANGER - Automatic Timing & Controls
LO-PROFILE - Aries Electronics
LORAIN - Lorain Products
LO-RISE - Welcon/Wells
LO-SMOKE - BIW Cable Systems
LOSSYLINE - Capcon
LOW BOY - Stancor Products
LOW-PEAK - Bussmann:Cooper Industries
LOXARMOR - Okonite
LTMOS - Motorola Semiconductor Prods.
LTN (LINEAR THERMISTOR NETWORK) - Fenwal Electronics/APD
LUBE-LOK - E/M Corporation
LUBRI-BOND - E/M Corporation
LUBRICOMP - LNP Engineering Plastics
LUBRI-SHINE - Tech Spray
LUFKIN - Cooper Tools
LUMAPAC - EWC
LUMA 2 - RAYOVAC Corporation
LUMEA - Lutron Electronics
LUMEX-LITES - Lumex Opto/Comps.
LUMI - Chrono-log
LUMIGRAPH - International Instruments:APrime Technology
LUSTRAN ABS - Monsanto
LUSTRE-ZINC - Titchener, E. H.
LUXAMP - Force
LUXICON - Dolan-Jenner Inds.
LUXTHERM - Eraser
MACH SERIES - Data Translation
MAC MOVER - Tri-Data Systems
MACOR - Corning Glass Works
MACROCHIP - Ferranti Interdesign
MACROEDITOR - Applied Micro Circuits
MACROLOADER - Macrolink
MACRO MATRIX - Applied Micro Circuits
MACRO-T - Motorola Semiconductor Prods.
MACRO-3 - Macrolink
MACSART - Multi-Amp
MACSYM - Analog Devices
MACXLINE - Andrew
MAGEN - Haverly Systems
MAGI-START - Vernitron Piezoelectric
MAG MASTER - Belden Wire and Cable

MAGMOD - General Magnetics
MAGNACOMP - LNP Engineering Plastics
MAGNA-GUARD - Egis Corporation
MAGN-A-PAK - International Rectifier
MAGNA Q - Vanguard Electronics
MAGNA-SET - Princo Instruments
MAGNATORC - IMC Magnetics
MAGNA-VISUAL - Jobmaster
MAGNEFORM - Maxwell Laboratories
MAGNEMETRICS - Walker Scientific
MAGNEPAINT - Micro-Circuits
MAGNESEARCH - Dowty RFL Inds. /Instrumentation
MAGNESIL - Magnetics
MAGNESTIR - Lab-Line Instruments
MAGNET-METAL - Egis Corporation
MAGNETOOL - Jobmaster
MAGNETREATER - Dowty RFL Inds. /Instrumentation
MAGNETTE - Heinemann Electric
MAGNION - Walker Scientific
MAGNI-WHIRL - Blue M, A Unit of General Signal
MAGSTRIPE - American Magnetics
MAGTERM - Zierick Manufacturing
MAGTON - Lucas Ledex
MAINTAINER - IVEK
MANCHEX - Exide Corporation
MANIX - Mann, Henry
MANSON - Okonite
MAN-TRIX - Mantex
MARAGLAS - Acme
MARASET - Acme
MARATHON - Babcock Display Products
MARCOFLEX - Oak Switch Systems
MARELCO - Marel Instr.
MARINEFAX - Alden Electronics
MARINE-MATE - Bird Electronic
MARK * CAL - GM Nameplate
MARK C - Cole Instrument
MARKET-COM - Aiphone
MARNAV - Markat
MAS-CON - Panduit
MASQ-MATIC - Sel-Rex
MASS-TER - Belden Wire and Cable
MAS/TER - ITT Cannon:Military/Aerospace
MASTERCOUNT - Master Electronic Controls
MASTERELAY - Master Electronic Controls
MASTERFLASH - Master Electronic Controls
MASTER FLOW - Master Appliance
MASTER-MITE - Master Appliance
MASTERTIME - Master Electronic Controls
MATE-N-LOK - AMP
MATHPAC - Acurex /Autodata
MATRI DOT - Practical Automation
MATTHEY - Television Equipment
MAX - Dynapar
MAXBRITE - Melles Griot
MAX-E-PITCH - Berg, W. M.
MAXI-BEAM - Banner Engineering
MAXI CHIP - AVX Corporation
MAXI CLIPPER - Mueller Elec.
MAXI-COLOR - Belden Wire and Cable
MAXI-DRY - FTS Systems
MAXIGRABBER - Pomona Electronics
MAXIPOWER - Trio Laboratories
MAXI-QUBE - American Technical Ceramics Corporation
MEASUROMETER - Analogic
MEDCELL - Alexander Batteries
MEDI-SAFE - BRIntec
MEGACLUSTER - Paracom
MEGASTRATES - Coors Ceramics
MEGATROMETER - Transicoil
MEGAVOICE - Paso Sound Products
MEG-CHEK - Associated Research
MEGMETER - Ross Engineering
MEG-O-VOLT - Sperry, A. W. Instruments
MEMAMP - Multi-Amp
MEMORASE - UVP
MEMORY MAG - EG&G Geometrics
MEMORYMATE - Burndy Corporation
MEMPAC - Varta Batteries
MEMSCAN - Vicon Industries
MEMTRON - Memtron Technologies
MERCURY - WALTER KIDDE
MEREDIAN - Leeds & Northrup, General Signal
MERRILL - Cooper Tools
MESH STRIP - Chomerics, :W.R. Grace
MESSENGER - Babcock Display Products
META-CAST - Mereco Products
META-DUCT - Mereco Products
METAICE - Metalink Corporation
METALARC - GTE Sylvania Lighting
METALAST - Electro Physics
METALASTIC - Chomerics, :W.R. Grace
METAL DEVIL - Ohmite Manufacturing
METALINK - Metalink Corporation
METALKLIP - Chomerics, :W.R. Grace
METAL-MITE - Ohmite Manufacturing
METALOK - Burndy Corporation
METAL V-SEAL - Parker Seal Grp.
METAMETER - Bristol Babcock
METANET - Sprague Electric
METAPART - Mereco Products
METASTEP - Step Engineering
METATERGE - Mereco Products
METATRONIC - Bristol Babcock
METFILM - Sprague Electric
METOXILITE - Semtech
METRE GRIP - Mereco Products
METRISITE - Gould
METRO-COLOR - Belden Wire and Cable
METROLOGGER - Metrosonics
METROREADER - Metrosonics
METROSOFT - Metrosonics
MICAL - Topflight
MICAMP - Avantek
MICAP - Tobe Deutschmann Labs.
MICRO BEAD - Victory Engineering
MICROCAP - American Technical Ceramics Corporation
MICROCELL - Kistler-Morse
MICRO CLIPPER - Mueller Elec.
MICROCOAX - Micro-Coax Components
MICRO-C/PROBE - International Instrumentation
MICROCYCLE - Syscon Intl.
MICRO-DIP - EECO
MICRO-FERRUPS - Best Power Technology
MICROFIBRE - Balston
MICRO-FILE - Scanbe
MICRO-FILTER - RFI Corporation
MICROFLASH - EG&G
MICRO-FLUOR - CUNO
MICROFORK - Murata Manufacturing , Ltd.
MICROFRAME - Monolithic Sys.
MICRO-GATOR - Mueller Elec.
MICROGRABBER - Pomona Electronics
MICROHEX - ITT Sealectro
MICRO-I - Delevan
MICRO ICE - Metalink Corporation
MICROKEY - Advanced Input Devices
MICRO-KLEAN III - CUNO
MICROLABELLER - EPC Identification Sys.
MICRO LINK - Timeplex
MICRO-LOC - BEI Motion Systems
MICRO-LOK - Electro-Science Labs.
MICROMATIC - ITW Paktron
MICROMAX - Leeds & Northrup, General Signal
MICRO MELT - Ajax Magnethermic
MICRONET - Sidereal
MICRONOX - Caddock Electronics
MICRO/OMNITRAK - EG & G Flow Technology
MICRO-OPTIC - Dolan-Jenner Inds.
MICRO-PAC - Semtech
MICROPAINT - Micro-Circuits
MICROPAN - Vicon Industries
MICROPIN - ITT Cannon:Military/Aerospace
MICROPLEXER - Timeplex
MICROPLOT - Gulton Graphic Instruments
MICROPORT 8 - Telesis Controls
MICRO POWER - RAYOVAC Corporation
MICROPROX - Bently Nevada
MICRO/Q - Rogers
MICROREG - Valor Power Systems
MICROSCAN - Vicon Industries
MICRO-SCREEN - CUNO
MICROSCRIBE - Houston Instrument
MICROSEAL - E/M Corporation
MICROSERIES - Itek Encoder
MICROSLICE - Integrated Device Technology
MICRO-SLIDE - Grant Hardware
MICROSOCKET - ITT Cannon:Military/Aerospace
MICROSQUARE - MWS Wire Industries
MICRO-STAC - Semtech
MICROSTAR - Power-Science
MICROSTAT II - Ecosoft
MICRO-STEDI - Hexacon Electric
MICROSTREAMER - Cipher Data Prods.
MICRO-SYNCLAMPS - Timber-Top
MICROTEMP - Micro Devices Product Group
MICROTEMP - Therm-O-Disc
MICROTENN - Tenney Engineering
MICROTHERM - Canadian Thermostats & Control Devices Ltd.
MICROTIP - Heat System
MICROTOUCH - Microavionics
MICROTRAC - Leeds & Northrup, General Signal
MICROTRON - Bussmann:Cooper Industries
MICROWAFER - Stanton Magnetics
MICRO-WAND - Hand Held Products
MICROWIRE - PCK Technology
MICROZOOM - Cambridge Instruments
MIDAS TOUCH - International Instrumentation
MIDGET - Sprague Electric
MID-RISE - Welcon/Wells
MIGHTY-MITE - LH Research
MIGHTY MUX - Point 4 Data
MIGHTY-TUFF - Flambeau Products
MIL-CLAMP - Amphenol RF Operations
MIL-CRIMP - Amphenol RF Operations
MIL-ENE - W. L. Gore
MILPAC - Densepac Microsystems
MILROS - Alpha Metals
MIN-E-PITCH - Berg, W. M.
MINERALIGHT - UVP
MINI-BEAM - Banner Engineering
MINI BEE - Hurst Manufacturing
MINI BITE - Minelco - A Talley Ind.
MINI-BLOK - Bivar
MINI-BREAKER - Mechanical Products
MINIBRIDGE - Electronic Devices
MINI/BUS - Rogers
MINIBUTTON - Digitran
MINICAM - Alan Gordon Entprs.
MINI-CATOR - Industrial Devices
MINICHINE - Pace
MINI CLIPPER - Mueller Elec.
MINICOUNTER - Veeder-Root
MINI-CUBE - American Technical Ceramics Corporation
MINI-DEK - Braemar
MINI-DOT - Industrial Devices
MINIDUCTOR - United Transformer : of Opt Industries
MINIFAX - Alden Electronics
MINI-FIT, JR. - MOLEX
MINIFLYX - Brim Electronics
MINI-GATOR - Mueller Elec.
MINIGRABBER - Pomona Electronics
MINIGUN - Raychem
MINIKEY - Digitran
MINILEVER - Digitran
MINILOAD - Bird Electronic
MINILOK - Burndy Corporation
MINILYTIC - Sprague Electric
MINI-MAG - Potter & Brumfield
MINI/MATE - RTE Power/Mate
MINI-MATH PAC - Acurex /Autodata
MINI MEG - Integrated Digital Products
MINI-METER - Sperry, A. W. Instruments
MINI-METOXILITE - Semtech
MINI-METRIC - Allen Bradley , Electronic Components
MINI MICROTEMP - Micro Devices Product Group
MINI-MIKE - ITW Switches
MINI MITE - Thermo Electric
MINIMOTOR - Micro Mo Electronics
MINI-IN-DISGUISE - International Instrumentation
MINI-PAK - DEVAR
MINI-PAL - Sundstrand Data Control
MINIPROBE - Sperry, A. W. Instruments
MINIPROGRAMMER - Cole Instrument
MINI-ROCKETTE - Communication Devices
MINISAT - Powertech
MINISEAL - Raychem
MINI-SENSOR - Ketema/Rodan
MINISERT - DuPont Electronics
MINISERVO - Esterline Angus Instrument
MINI-SLIDE - Industrial Devices
MINISPLICE - Autosplice
MINISTAC - Semtech
MINISTIC - Semtech
MIN-ISTOR - Quality Thermistor
MINI-STUD - Semtech
MINISWITCH - Digitran
MINI-SYNCLAMPS - Timber-Top
MINITAC - Hypertronics
MINITERM - Computer Devices
MINITHIN - Thermax Wire
MINITORCH - Fisons Instruments
MINI TRIM - Kappa Networks
MIN MAX ALERT - John Fluke Mfg.
MINNISCRUBBERS - Tech Spray
MINUET - Beswick:Cooper U.K. Ltd.
MIRA-BRITE - International Wire Products
MITAS - Superior Electric
MITE - LH Research
ML-SOFT - EPC Identification Sys.
MODCOM-C - Virginia Plastics
MODEMULATOR - Com/Tech Systems
MOD-FIELD - Dataprobe
MOD POT - Allen Bradley , Electronic Components
MOD SQUAD - International Instrumentation
MOD-U-BOX - Precision Fabrication Technologies
MODULA - Gennum Corporation
MODULE-MATIC - Sel-Rex
MODULE-X - Sel-Rex
MODULOAD - Bird Electronic
MODULOK - Burndy Corporation
MODULYNX - Superior Electric
MODUPULSE - Vicon Industries
MODU-RAY - Kalglo Elctrns.
MODUTRIM - Sprague-Goodman Elctrns.
MOES - Elastomeric Technologies
MOISTURPUMP - Electro Impulse
MOLD-EASE - Merix Chemical
MOLECULOY - Molecu-Wire
MOLGARD - Ram Chemicals, Whittaker
MOLICEL - Moli Energy Limited
MOLYDACQ - Molytek
MOLYDAG - Acheson Colloids
MOLYGRAPHICS - Molytek
MOLYKOTE - Dow Corning
MOLYNET - Molytek
MONITROLLER - Analogic
MONITRONIX - TransKinetic Sys.
MONOBRID - ILC Data Device
MONOCERAM - SFE Technologies
MONOCHIP - Ferranti Interdesign
MONOMAX - Motorola Semiconductor Prods.

MONOPAX - Tra-Con
MONOPOXY - Hardman
MONOZOOM - Cambridge Instruments
MORE-4-LESS - Signal Transformer
MORNICK - Cosar Corporation
MOSAIC I - Motorola Semiconductor Prods.
MOSBIP - Powerex
MOSP - Microwave Systems
MOTO-VATOR - Electrol
MOUNTAINTOP - Accugraph
MOUSEWINDOW - MSC Technologies
MOXIE - Canadian Thermostats & Control Devices Ltd.
MPCII - HMW Enterprises
M POWERCELL - Catalyst Research
M/R THERMALEZE - Phelps Dodge Magnet Wire
MRTV - Insulcast
MS-SYNCLAMPS - Timber-Top
M-SYSTEM - Electromatic Controls
M-TIMER - Codar Technology
MTTL - Motorola Semiconductor Prods.
MT-8500 - Astro-Med
MULTI-BEAM - Banner Engineering
MULTI-CAGE - Electronic Solutions
MULTI-CJ - Omega Engineering
MULTICLUSTER - Paracom
MULTICOM - Multi-Tech Systems
MULTI-CONN - Vector Electronic
MULTI-COOL - FTS Systems
MULTI/COUNT - HH Controls
MULTICUT - Accugraph
MULTIDEX - Oak Switch Systems
MULTIDIAL - Spectrol Electronics
MULTIDRAW - Accugraph
MULTIDUCTOR - Ajax Magnethermic
MULTIERASER - BYTEK
MULTIFILAR - MWS Wire Industries
MULTIFIRE - Ferro Corporation
MULTIFLASH - EG&G
MULTIGARD - Helm Instrument
MULTI-GRAPHIC - Bogen Communications
MULTILATHE - Accugraph
MULTI-LINK - Belden Wire and Cable
MULTILYTHIC - Sprague Electric
MULTI MITE - Thermo Electric
MULTIMOD - Powertec Power Supplies
MULTIMODEM - Multi-Tech Systems
MULTIMUX - Multi-Tech Systems
MULTI-PAC - Elfab Corporation
MULTIPOWER - Trio Laboratories
MULTIPROGRAMMER - BYTEK
MULTIPUNCH - Accugraph
MULTI-PURE - Multicore Solders
MULTIREED - Thermosen
MULTI-SENSOR - Plessey Electronic Systems
MULTI-STRIP - W. L. Gore
MULTI-SWAGE - Bead Electronics
MULTISYN - Del Elctrns.
MULTISYST - EMCA/ROHM & HAAS
MULTI-TET - W. L. Gore
MULTITOOL - Paracom
MULTI-TRAN - Sperry, A. W. Instruments
MULTITUBES - Casso-Solar
MULTI-VOLT - Multi-Amp
MULTIWATT - SGS-THOMSON Microelectronics
MULTIWIRE - PCK Technology
MU-STAT - Princo Instruments
MYAD - C.P. Clare
MYSTAIRE - Heat System
MYSTR - Waters Manufacturing
NAFOAM - National Wire & Cable
NAFOIL - National Wire & Cable
NAMCO - Namco Controls
NANALINE - Bel Fuse
NANOHEX - ITT Sealectro
NANOMIN RECEIVER - E-Systems
NANO-SKAN - Skan-A-Matic
NANOTIP - Heat System
NANOTRAN - Computer Products
NARR-O-GIDE - Bivar
NASTY GAS - EG&G Rotron
NATIONAL - Richardson Electronics, Ltd.
NAUPAC - Densepac Microsystems
NAVCORE - Collins Avionics
NAVITAR - D. O. Industries
NAVLINE - Veeder-Root
NAVTRAK - EDO Western
NEDAP PS - Nedap N.V.
NELCO - Whittaker
NEMACOMP - Telesis Controls
NEPTUNE - SFE Technologies
NETCOM - Acurex /Autodata
NETCOMMANDER - Digital Products
NETIC - Magnetic Shield Corporation
NETMASTER - Innovative Electronics
NETPAC - Acurex /Autodata
NETSAVERS - Sutton Designs
NETWAY - Tri-Data Systems
NETWORK-90 - Bailey Controls
NEUTROLOY - Molecu-Wire
NEUTRONEX - Sel-Rex
NEUTRO-STAT - Simco
NEWDAMP - Bacon Industries
NEWSMATE - Cosar Corporation
NEYDIUM - The J. M. Ney
NEYETCH - The J. M. Ney
NEYORO - The J. M. Ney
NICAD - SAFT America
NICHOLSON - Cooper Tools
NICKEL-PLUS - International Wire Products
NICKELPLY - National-Standard
NIGHT HAWK - Harris
NIGUARD - AVX Corporation
NISENSOR 35 - Molecu-Wire
NOALOX - Ideal Industries
NOBRUSH - Georator
NOHKEN - ZI-TECH Instrument
NO-MAR - PIC Design
NO-NIK - Clauss Cutlery
NOR - Ferraz Corporation
NORAC - BIW Cable Systems
NORBATHERM - Cross Electronics
NORDBAK - ChemRex
NORFA - IPM
NORPAK - Square D
NO-SLIP - PIC Design
NO-SWAB - E/M Corporation
NOVIMIDE - Furane Products
NOXIDE - Solder Absorbing Technology (SAT)
NU-AGE - Alan Gordon Entprs.
NU-BLAC - Star Porcelain
NUCLESTAT - NRD
NUCON - CINCH Cylindrical
NULL-KOTE - Princo Instruments
NU-LOK - CINCH Cylindrical
NUMATRON - Leeds & Northrup, General Signal
NUMERIPATH - Giddings & Lewis Electronics
NUMERIPOINT - Giddings & Lewis Electronics
NUSYN - Mesur-Matic Elctrns.
NYEBAR - William F. Nye
NYETACT - William F. Nye
NYLAFLOW - Polymer
NYLASINT - Polymer
NYLATCH - Hartwell
NYLATRON - Polymer
NYLEZE - Phelps Dodge Magnet Wire
NYLOCLIP - Burndy Corporation
NYLOX - Hardman
NYMPH - SARONIX
NYOGEL - William F. Nye
NYTYE - Heyco Molded Products
NYZIN - Whittaker-Yardney Power Systems
OCTAGON - Regency Land Mobile
OCTA-SCAN - EDL
OCTRON - GTE Sylvania Lighting
ODORPEDIC - United Foam Plastics
OHMEX-AG - Transene
OHMICONE - Ohmite Manufacturing
OHMITRAN - Ohmite Manufacturing
OHMITROL - Ohmite Manufacturing
OHM-RANGER - Ohmite Manufacturing
OHM-SPUN - Multi-Amp
OILDAG - Acheson Colloids
OILON PV - Polymer
OILOSTATIC - Okonite
OKOCLAD - Okonite
OKOCORD - Okonite
OKOGUARD - Okonite
OKOLENE - Okonite
OKOPRENE - Okonite
OKOSEAL - Okonite
OKOSHEATH - Okonite
OKOTHERM - Okonite
OMEGACLAD - Omega Engineering
OMEGAFILM - Omega Engineering
OMEGALABELS - Omega Engineering
OMEGALAQ - Omega Engineering
OMEGALINE - Omega Engineering
OMEGALOK - Omega Engineering
OMEGA METER - Alpha Metals
OMEGAPAD - Omega Engineering
OMEGAPAK - Square D
OMEGAPELLETS - Omega Engineering
OMEGASCOPE - Omega Engineering
OMEGASTIKS - Omega Engineering
OMEGATEMP - Omega Engineering
OMEGATITE - Omega Engineering
OMMI-COAT - Nuclear Research
OMNEPHASE - International Controls & Measurements
OMNETIME - International Controls & Measurements
OMNI - Haverly Systems
OMNI-AMP - Omega Engineering
OMNI-BLOK - Littelfuse
OMNIBUS - Topaz
OMNI CELL - Chomerics, :W.R. Grace
OMNICLOSURE - Techmar
OMNICUTTER - ELVO: of Zumbach Electronics Corporation
OMNIFLO - EG & G Flow Technology
OMNI-GLOW - Industrial Devices
OMNIGRAPHIC - Houston Instrument
OMNI III - Sloan Technology Corporation
OMNIMARK - Scientific Technologies
OMNIMODE - Racal-Milgo
OMNIMUX - Racal-Milgo
OMNIPROX - Scientific Technologies
OMNISCAN - Vicon Industries
OMNISCRIBE - Houston Instrument
OMNI-SPRA - Tech Spray
OMNI-STRIPPER - Mann, Henry
OMNY-BUS - Methode Electronics
OMNY-PAC - Methode Electronics
ONE CHIP PLUS - Capital Equipment Corporation
ONE MICRON BIPOLAR - TRW LSI Products INC.
ONE MICRON CMOS - TRW LSI Products INC.
ONSPEC - Heuristics
ON THE BALL - Merix Chemical
OOPS PROOF - Beckman Industrial
OPCOA - Electronics Research Associates
OPEN-BRIK - Powerex
OPEN WINDOW - Lee Data Corporation
OPIC - Sharp Electronics
OPSYCA - Specialty Cable Corporation
OP-TACH - Amprobe Instrument
OPTACH - HH Controls
OPTALIGN - Cinch Connector
OPTASPLICE - Cinch Connector
OPTAXIAL - Scientific Technologies
OPTECON - Data Technology
OPTEL - Electronics Research Associates
OPTEMP - Beede Electrical Instrument
OPTIGUARD - Dow Corning
OPTI-KEY - Bowmar Instrument
OPTIMA - Excelta Corporation
OPTIMATE - AMP
OPTIMATION - Julie Research Labs.
OPTI-MAX - Solid State Systems
OPTI-MISER - Acme Transformer
OPTOFLEX - Scientific Technologies
OPTO/LINK - Interoptics
OPTOLITE - Oak Switch Systems
OPTOLOGIC - Quality Technologies
OPTOMUX - Opto 22
OPTORELAY - Scientific Technologies
OPTOSAFE - Scientific Technologies
OPTOSWITCH - Scientific Technologies
OPTOWARE - Opto 22
ORANGE DROP - S. B. Electronics
ORASORB - Sel-Rex
ORCAD/PCB - OrCAD Systems
ORCAD/SDT - OrCAD Systems
OROCLAD - Technic
OROMERSE - Technic
OROSENE - Technic
OROTEMP - Technic
OROTHERM - Technic
ORTHONOL - Magnetics
ORTHO-QUAD - Anaren Microwave
ORTHOSTAR - FEI Microwave
OSCAR - E & L Instruments
OVERTIME - Eveready Battery
OXIFIRE - Ferro Corporation
OXYTRON - Sel-Rex
PACENTER - Pace
PACE/PAK - International Rectifier
PACHYDYNE - Ajax Magnethermic
PACX - Gandalf Data
PADLA - Macrolink
PAESAR - Lutron Electronics
PAGEPAC - Harris
PAK-RAK - Unitrack Industries
PAK-X-TRAC - Nu-Concept Systems
PAL-DOC - H. Wm. Myers
PALINEY - The J. M. Ney
PALLABAR - Technic
PALLADEX - Sel-Rex
PALLAMERSE - Technic
PALLETEDAC - Integrated Device Technology
PALOMAR - Palomar Engineers
PAMUX - Opto 22
PANALYZER - Panametrics
PANAPRESS - PanaVise Prods.
PANCAKE - The Wiremold
PAN-CODE - Panduit
PANDUCT - Panduit
PANELCODER - Disc Instruments
PANELKEY - Advanced Input Devices
PANELMAKER - Berkeley Process Control
PANEL MITE - Tech Laboratories
PANELSWITCH - IEE (Industrial Electronic Engineers)
PANEL-TRAN - Acme Transformer
PAN-FLEX - Panduit
PAN-L-SCREW - Dupree
PAN-L-TEMP - EDL
PAN-STEEL - Panduit
PAN-TERM - Panduit
PANTHER - Okonite
PAN-TY - Panduit
PAN-WAY - Panduit
PARABOLIX-100 - Merix Chemical
PARACONVERTER - LNR Communications
PARAFORMER - Adtech Power
PARARECEIVER - LNR Communications
PARASOL - Berkeley Process Control
PARK ELECTRONICS - Park Electronics
PARTGARD - Helm Instrument
PARTICU-LO - General Chemical Corporation
PARTILOK - Ferro Corporation
PASO - Paso Sound Products
PASSGUARD - Malco Systems
PATCHMAN - United States Software
PATCHMASTER - Cinch Connector
PATCHMATE - ADC Telecommunications
PATHFINDER - Bishop Graphics
PATHFINDER - Teledyne Gurley
PATRIOT - Aydin
PAVE-MATE - PAVE Technology
PCB IMPAC - Semtech
PCB-TAINER TM - EG & G Birtcher
PC-GRAPHOVER - New Media Graphics

PC LAB - Data Translation
PC-LABCARD - American Advantech
P-C-LITE - Visual Communications
PCMS - RACET Computes, Ltd.
P-CONN - Panduit
PC SEMPER - Data Translation
PC/STD 88 - Ziatech
PC-TRON - Bussmann:Cooper Industries
P-DOS - Eyring Research Inst.
PED-A-VAC - Pace
PEEL-A-WAY - Advanced Interconnections
PEE-WEE - Mueller Elec.
PEGI - Adalet-PLM Div
PELCOLOY - Molecu-Wire
PEM - Penn Engineering & Manufacturing
PEMFLEX - Penn Engineering & Manufacturing
PEMHEX - Penn Engineering & Manufacturing
PEM-SERTER - Penn Engineering & Manufacturing
PENFILE - Jonard Industries
PEN-RAY - UVP
PENTAFLOW - Interfan
PENTAWATT - SGS-THOMSON Microelectronics
PEN WAND - Interactive Computer Products
PERFORMAXX - Electrochem Industries
PERI-APOLLAR - Heitz, Karl
PERMABOND - Alpha Metals
PERMACOTE - Miller Dial
PERMAFOAM - Carol Cable
PERMALINE - Carol Cable
PERMANODE - Sel-Rex
PERMA-SLIK - E/M Corporation
PERMOHM - Belden Wire and Cable
PERM-O-PAD - Bivar
PGA E-Z MOUNT - Thermalloy
PHASE/AMP - Halmar Electronics
PHASE EIGHT - Vicon Industries
PHASOR - Ajax Magnethermic
PHENOWELD - Hardman
PHI-DECK - Phi Technologies
PHOTOCOR - Corning Glass Works
PHOTO ETCH - Datak
PHOTOMOD - Clairex Electronics
PHOTO-OPTIC - Dolan-Jenner Inds.
PHOTOZOOM - Cambridge Instruments
PIANO-DIP - Grayhill
PIC - Microchip Technology
PICABOND - AMP
PIC-A-DIP - Micro Electronic Systems
PICK-A-BACK - EG & G Flow Technology
PICO MEG - Integrated Digital Products
PICOMIN - Endevco
PICOPROBE - GGB Industries
PICO-SKAN - Skan-A-Matic
PICOTRIAX - Endevco
PICOTRIM - Voltronics Corporation
PIDG - AMP
PIELEFORK - Murata Manufacturing , Ltd.
PIELEOSCILATOR - Murata Manufacturing , Ltd.
PIEZITE - Endevco
PIEZOFET - Wilcoxon Research
PIEZOTITE - Murata Manufacturing , Ltd.
PIGMY-HIPPO - Mueller Elec.
PINGUIDE - Mann, Henry
PINLITES - Electronics Research Associates
PIN SERIES - Gandalf Data
PINSETTER - MOLEX
PINSTAMP - Telesis Controls
PINWRITER - NEC Information Systems
PIPETRON - Electro-Support Systems
PISTONCAP - Sprague-Goodman Elctrns.
PITMO - PITTMAN
PIXIE - Endevco
PLANAR PAK - Avantek
PLAN-VU - Alan Gordon Entprs.
PLASMAFLEX - Babcock Display Products
PLASMAFLUX - Walker Scientific
PLASTI-BOND - AMP
PLASTIC PIN CARRIER - McKenzie Technology
PLASTIDOME - Andrew
PLASTIFLEX - Auburn Mfg.
PLASTIFORM - Jobmaster
PLASTI-GRIP - AMP
PLASTILEASE - Ram Chemicals, Whittaker
PLASTINITE - Fastex
PLASTI-PLUGS - Fastex
PLASTI-RING - Fastex
PLASTI-SKAN - Skan-A-Matic
PLAST-N-GLASS - Chemtronics
PLAST'O'WIRE - Electronic Controls
PLATANEX - Sel-Rex
PLATANIUM - Sel-Rex
PLATINUM N - Technic
PLAY MATES - Speco
PLC VISION - Penn Video
PLDESIGNER - Minc
PLENAIR - Teledyne Thermatics
PLOTAMATIC - Allen Datagraph
PLUGMOLD - The Wiremold
PLUG STAT - Control Products
PLUMB - Cooper Tools
PLUMBICON - Amperex Electronic
PLYCON - Methode Electronics
PLYO-DUCT - Methode Electronics
PM-GRAPH - Esterline Angus Instrument
PMT - Esterline Angus Instrument
POCKET FLOW - Kurz Instruments
POCKET-PROBE - EDL
POGO CONTACT - Augat/Pylon
POGO LAMP - Dupree
POINTFINDER - Teledyne Gurley
POLA-H - Chomerics, :W.R. Grace
POLARHEX - Hughes Aircraft
POLARIS - IEE (Industrial Electronic Engineers)
POLASHEET - Chomerics, :W.R. Grace
POLASTRIP - Chomerics, :W.R. Grace
POLY * CAL - GM Nameplate
POLYCASE - POLYCASE PRODS.
POLYCOHR - CHR Industries
POLY-DIMENSIONAL - Amco Engineering
POLYFLEX - Eagle Signal Controls:A Mark IV Inds.
POLYFLEX - Judd Wire
POLYHAL - Judd Wire
POLYMET - Polymer
POLY-META-SYMBOLICS - Step Engineering
POLYPAD - Bergquist
POLYPENCO - Polymer
POLYPLY - PolyPly
POLYPRO - CUNO
POLYRAD - BRIntec
POLYRITE - PolyPly
POLYSWITCH - Raychem
POLY-TOUCH - Miller Dial
POLYTWIST - Litton Poly-Scientific
PORCUPINE METALASTIC - Chomerics, :W.R. Grace
PORO-KLEAN - CUNO
PORON - Rogers
PORTA-CURE - American Ultraviolet
PORTAMETRIC - Electro Scientific Industries, (ESI)
PORTANIM - Berkeley Nucleonics
PORTA-PACK - Brady, W. H.
PORTA-PEAK - Helm Instrument
PORTA-PROCESSOR - Teledyne Ryan Electronics
PORTA Z - Sencore
PORTION-AIRE - Glenmarc Manufacturing
PORTIONATOR - Glenmarc Manufacturing
POSI-CHIP - Fenwal Electronics/APD
POSI-CRIMP - Teledyne Ansonia
POSI-GROUND - Hexacon Electric
POSI-LOCK - ITT Sealectro
POSISTOR - Murata Manufacturing , Ltd.
POSITRAK - Delta Design
POSTLATCH - Burndy Corporation
POT-RITE - Alpha Metals
POUNDER - Pyle Industries
POWERBASE - Motorola Semiconductor Prods.
POWERCAP - Baknor Industries
POWERCENTER - Topaz
POWER COMMANDER - Perma Power Elctrns.
POWERDEX - Gould
POWERDIAL - Lutron Electronics
POWERFET - Teledyne Crystalonics
POWER GUN - Bell, F. W.
POWERHOUSE - Dynatech Computer Power
POWERLOGIC - Topaz
POWER LOGO - NCE:National Custom Enterprises
POWERLYTIC - Sprague Electric
POWERMAKER - Topaz
POWER MASTER - Shure Brothers
POWERMATE - NEC Information Systems
POWER-MATIC - Power-Science
POWER MEG - Pacer Industries
POWER MISER - Westinghouse Electric
POWEROHM - Ferro Corporation
POWER-O-MATIC 90 - Blue M, A Unit of General Signal
POWER PAC - PDS Technologies
POWER PROCESSOR - Powercube
POWER-READY - Acme Electric Corporation
POWERSAFE - Computer Products
POWERSCOPE - Basic Measuring Instruments
POWER SENTRY - Surgeonics Limited
POWERSTAR - Intepro Systems
POWERSTAT - Superior Electric
POWER-STRIPMASTER - Ideal Industries
POWER-STYLE - Square D
POWERSYSTEM - Powertec Power Supplies
POWERTAP - Motorola Semiconductor Prods.
POWERTEST - NH Research
POWERTHERM - Gentron
POWERTRON - Industrial Test Equipment
POW-R-BLOK - Powerex
POW-R-BRIK - Powerex
POWRCONVERTER - Rapid Power Technologies
POW-R-DISC - Powerex
POWRDRIVE - Rapid Power Technologies
POW'R ETCH - Datak
POWRFILM - Ohmite Manufacturing
POWR-RIB - Ohmite Manufacturing
POW-R-SAFE - Multi-Amp
POWRSHARE - Rapid Power Technologies
POWRSHIELD - Rapid Power Technologies
POWRTAP - Rapid Power Technologies
POW-R-TOW - Berg, W. M.
POWR-TRAK - Adatek
POW-R-VEE - Berg, W. M.
PRECIPLACER - ELVO: of Zumbach Electronics Corporation
PRECISION DUSTER - Tech Spray
PRECISION-MASTER - Ideal Industries
PRECISION PRINTER II - Tech Spray
PRECISOLD - ELVO: of Zumbach Electronics Corporation
PRECISTA - Excelta Corporation
PREKOTE - Tech Spray
P/REL - Standard Grigsby
PRE-MET - Sel-Rex
PRE-PACK - Lutron Electronics
PRESSERTS - Precision Metal Products
PRESS-FIT - ITT Sealectro
PRESSLITE - Oak Switch Systems
PRESS-LOK - Aries Electronics
PRESSMATE - Cosar Corporation
PRESS-TO-HEAT - ESICO/TRITON
PRINCESS - Ungar
PRINTDIRECTOR - Digital Products
PRINT STIX - Topflight
PRITCHARD - Photo Research:Kollmorgen
PROB-A-LARM - Princo Instruments
PROBEYE - Hughes Aircraft
PROJECT: PCB - Dasoft Design Systems
PROLOGUE - Shure Brothers
PROLOID - Teledyne Ryan Electronics
PROMAC - CMV Software Specialists
PROMPRO - International Instrumentation
PROMUX - Grayhill
PRONG-LOCK - Waldes Truarc
PRONTO - Thermo Electric
PROPHET - Timeplex
PRO-SET - Blue M, A Unit of General Signal
PRO-STAR - Blue M, A Unit of General Signal
PROSWITCH - IEE (Industrial Electronic Engineers)
PROTAB - CMV Software Specialists
PROTECTOCOATS - Alpha Metals
PROTECTOGLOVE - Clean Room Prods.
PROTECTOMATIC - Schott Glass Technologies
PROTECTOR PACKS - Lumex Opto/Comps.
PROTECTOX - Technic
PROTISTOR - Ferraz Corporation
PROTOBOOK - E & L Instruments
PROTO-CLIP - Global Specialties
PROTOLOY - Molecu-Wire
PROTONEX - Sel-Rex
PROTOPAK - Global Specialties
PROTO-PAK - International Instrumentation
PROTRIP - CMV Software Specialists
PRO-TRONIX - Blue M, A Unit of General Signal
PROVICTOR - Victor Elec. Wire & Cable
PROXIMITOR - Bently Nevada
PRO-ZIF - Welcon/Wells
PRO-700 - Blue M, A Unit of General Signal
PUL-A-DIP - Micro Electronic Systems
PULL-THRU - Hughes Aircraft
PULSAR - Heat System
PULSAR II - E-Squared Technology
PULSER - Associated Research
PULSERAD - Physics International
PULSISTOR - Victory Engineering
PUPPETS - Bishop Graphics
PUR-A-GOLD - Sel-Rex
PURE CORE - Alpha Metals
PUREPOWR - Rapid Power Technologies
PURITAN - Tansitor Electronics
PURSE LOCK - Fastex
PUSH BITE - Minelco - A Talley Ind.
PYLE DRIVER - Pyle Industries
PYR-AU-BOND - Sel-Rex
PYREX - Corning Glass Works
PYROCOAT - SpecTran
PYRO-DUCT - Aremco Products
PYROMARK - Tempil
PYRO-SCOPE - Capintec Instruments
PYROTRON - Bailey Controls
PYROVIEWER - ElectroPhysics
QALTA - Macrolink
Q-FLEX - Sundstrand Data Control
QIKEJECT - Burndy Corporation
QIKLATCH - Burndy Corporation
QIKMATE - Burndy Corporation
QIKSTACK - Burndy Corporation
Q-MONITOR - Codar Technology
Q/PAC - Rogers
Q-PAD - Bergquist

Q-TIMER - Codar Technology
QUAD-LED - Dialight
QUADPAC - Densepac Microsystems
QUAD PAK - Opto 22
QUADRAC - Teccor Electronics
QUADRADAR - ITT Gilfillan
QUADRA-POWR - Jamesbury
QUADRA-TONE - Audiosone
QUAD-SPRING - Garry Electronics
QUANTACHRON - Matrix
QUAN-TECH - QUAN-TECH
QUASI-VISION - Dolan-Jenner Inds.
QUENCHARC - ITW Paktron
QUICK ALERT - C-COR Elctrns.
QUICK-BOND - Electro-Support Systems
QUICK CAPTURE - Data Translation
QUICK CONNECT - Warren G-V, Unit of Signal
QUICK DRAW - L & L Special Furnace
QUICK-E-POLES - The Wiremold
QUICK GRIP - Antenna Specialists
QUICKIE - DuPont Electronics
QUICKLINK - Lee Data Corporation
QUICKPRO - Fujitsu Microelectronics
QUICKTIP - Leeds & Northrup, General Signal
QUICKTRIM - Amphenol RF Operations
QUICK-WEDGE - Kedman
QUICK-2-LOCK - Berg, W. M.
QUIET FORCE - Howard Industries
QUIK/CIRCUIT - Bishop Graphics
QUIK KLIPS - Brim Electronics
QUIKLINK - Cambridge Electronics Laboratories
QUIK/PIK - Akro-Mils
QUIK-WRAP - Jonard Industries
QUIL - Motorola Semiconductor Prods.
QUINSTEP - Berger-Lahr
QUIN-TONE - Audiosone
QUINTRONIC - Berger-Lahr
QUIPTRON - Equipto Electronics
QWIK-TY - Glenair
RACE - Data Race
RACK-ALL - Fancort Industries
RA-CON - EBY
RADIAX - Andrew
RADI-FLUX - Hy-Cal Engineering
RADPLANE - Glenro
RADROUND - Glenro
RAHAM - General Microwave Corporation
RAILITE - Tensolite
RALLY RAP - ICO-RALLY Corporation
RAMANEL - Ram Chemicals, Whittaker
RAMASET - Ram Chemicals, Whittaker
RAM PART - Ram Chemicals, Whittaker
RAPID RACK - Scanbe
RAPIDRIV - Vaco Products
RAPID-SET - Mereco Products
RAPID-SYN - Motion Control Group
RAP-TIGHT - All-States
RASCO - Champion Technologies
RATE/CON - Com/Tech Systems
RATEWATCHER - Leybold Inficon
RATIO-PROBE - Capintec Instruments
RATIO-SCOPE - Capintec Instruments
RAYFOAM - Raychem
RAYMASTER - Gates, Geo. W.
RAYNGER - Raytek
RAYOSCAN - Leeds & Northrup, General Signal
RAYOTUBE - Leeds & Northrup, General Signal
RAYSISTOR - Raytheon
R-BOX - IET Labs
RBS--AC - Control Technology
RC-BOX - IET Labs
REACTALLOY - EMCA/ROHM & HAAS
REAL-AL - Acme
RE-CIRK-IT - Heinemann Electric
RE-COIL - Miller, L.C.
RECON - Digital Dynamics
RECON MICA - Stanley Electronics
RECORD-A-TEMP - EDL
RECTIGRAPH - Esterline Angus Instrument
RECTODYNE - Christie Electric
RED LINE - MISCO/Minneapolis Speaker
RED ARROW - Savoy Electronics
REDDI-BLENDER - Tra-Con
RED-EYE - Capintec Instruments
RED-HAT - Automatic Switch
REDI AIR - Automatic Switch
REDI-BAR - Hoffman, P. R., , Materials Processing
REDI-TROL - Electrol
RED LINE - Warren G-V, Unit of Signal
REEDAC - Gordos
REEDLAYS - Computer Components
REEL-QUIK - Alpha Wire
REEVELEC - Reeve Electronics
REF BLOC - Hy-Cal Engineering
REF CEL - Hy-Cal Engineering
REFLEX - Christie Electric
REFLEX - Precision Interconnect
REFRACTOSYN - HH Controls
REGAL - Electro-Science Labs.
REGATRAN - Electronic Measurements
REGATRON - Electronic Measurements
REGATTA - Amherst International
REGENCY PLUS - Regency Land Mobile
REGUPOWR - Rapid Power Technologies
REGUTAP - Rapid Power Technologies
REL - Richardson Electronics, Ltd.
RELAYMASTER - Master Electronic Controls
RELCO - Ritz Electronics/Relco
RELCO - U.S. Power Converting /Relco
RELEX - RAYOVAC Corporation
RELIABRAZE - Alpha Metals
RELI-ACON - Methode Electronics
RELIACOR - Alpha Metals
RELIAFOAM - Alpha Metals
RELIALAB - Tenney Engineering
RELI-ALOK - Methode Electronics
RELI-APAC - Methode Electronics
RELI-APLANE - Methode Electronics
RELI-APLUG - Methode Electronics
RELIAROS - Alpha Metals
RELIASOLV - Alpha Metals
RELIA-TEMP - EDL
RELIATEMP - Tenney Engineering
RELIFLEX - DuPont Electronics
RELIMATE - DuPont Electronics
REMAT - Digital Dynamics
REMDACS - Intersil
REMOVE-A-PAD - Dynaloy
REMOV-IC - Solder Removal
REMRAD - Nuclear Research
REPLENISHER - IVEK
RESIDUMETER - Jobmaster
RESISTOFILM - Robert Shaw Instrument
RESISTWEEZ - Pace
RES-LOK - Sinclair Radio Laboratories Ltd.
RESNET - Beckman Industrial
RESOLON - Duncan Electronics
RESOMICS - Murata Manufacturing , Ltd.
RESTECH - ChemRex
RETIP - Solder Removal
REVER-SYNCLAMPS - Timber-Top
REVEX - PMI Motion Technologies
RF GAIN - Richardson Electronics, Ltd.
RF*MACRO - Motorola Semiconductor Prods.
RHENEX - Sel-Rex
RHEOMET - Kester Solder
RHINO-HIDE - Pacific Electricord
RHODEX - Sel-Rex
RIBBON LINE - W. L. Gore
RIBBON WRAP - W. L. Gore
RIB-CAGE - DuPont Electronics
RIB LOCK - Genisco Technology
RIGEL II - Androtek/dmi
RING ALERT - Potter & Brumfield
RINGER - Sencore
RING-GUN - Waldes Truarc
RING-JECTOR - Waldes Truarc
RING-MOUNT - Waldes Truarc
RING-O-MAT - Waldes Truarc
RIPPLE ROUND - Alpha Metals
RIPPLEWELD - ITW Paktron
RISTON - DuPont de Nemours, E. I.
RITEOHM - Ohmite Manufacturing
RITE-WIRE PLUG - Brim Electronics
RIVET-LOC - ITT Sealectro
R-LITES - Genisco Technology
ROBOTEC - Power Designs
ROLCOM - Coors Ceramics
ROLLAWAY - Fancort Industries
ROLOX - Hardman
ROL-PAK - Waldes Truarc
ROMIS - Bently Nevada
RONOVI - International Machine & Tool
ROTA-CRIMP - AMP
ROTA-SLIDE - C & K Components
ROTO-DROSS - Atlantic Magnetics
ROTOPULSER - Dynapar
ROTO-TELLITE - Eaton /MSC Products
ROTO-TRACK - Barnes Engineering
ROUGHNECK - RAYOVAC Corporation
ROW-L-ER - Berg, W. M.
ROYALITIC - Industrial Midwec Capacitor
RTX - Harris Semiconductor
RUBICON - Transicoil
RUBRGLAS - APM-Hexseal
RUF-NEK - Hughes Aircraft
REGUDRIVE - Rapid Power Technologies
RUSH - Eraser
RUTHENEX - Sel-Rex
RUTILCON - Taiyo Yuden (USA)
SAFE-ALARM - Thermax Wire
SAFE FLEX - Electro-Support Systems
SAFELINE - GTE Sylvania Lighting
SAFE-PAK - Gems Sensors
SAFESCAN - Dolan-Jenner Inds.
SAFE-T-GRIP - Ideal Industries
SAFE-T-KLIP - Industrial Devices
SALI - Adalet-PLM Div
SAMTRON - Sam Sung Elctrn. Dvcs.
SANTOPRENE - Monsanto
SANTOTRAC - Monsanto
SAV-CON - Glenair
SCAN-CAD - Houston Instrument
SCANSWITCH - Motorola Semiconductor Prods.
SCANTEMP - Markem
SCAN-X - Del Elctrns.
SC-CONSIL - Tecknit (Eastern Facility)
SCEPTRE - Golden Pacific Electronics, Inc
SCHOTT-BK 7 - Schott Glass Technologies
SCHOTT DIRECTRITE - Schott Glass Technologies
SCOLOR - The First Electronics
SCOTCH - Prof. A/V & Specialty Prod.
SCOTCHFLEX - 3M-Electronic Products
SCOTCHLOK & SCOTCHCODE - ICO-RALLY Corporation
SCULPTURED CIRCUITS - Advanced Circuit Technology
SDR 100 - Schott Glass Technologies
SEA BEAM - General Instrument
SEAFORCE - General Instrument
SEALCAP - Sprague-Goodman Elctrns.
SEALECTROBOARD - ITT Sealectro
SEALECTROCARD - ITT Sealectro
SEALECTROSWITCH - ITT Sealectro
SEALINK - Burndy Corporation
SEALPAK - American Zettler
SEAL-TRIMS - Johanson Manufacturing Corporation
SEARCH PRO - Direct Aid
SECRE/DATA - Com/Tech Systems
SECUR-A-TACH - Dennison Mfg.
SECUR-A-TIE - Dennison Mfg.
SECURE-COPY - Video Automation Systems
SECUREX - Canada Wire and Cable Limited
SE-CUR-IT - Ambroid
SECURSTRIP - Control Module
SF/DUROID - Rogers
SEED - Belden Wire and Cable
SEELBOLTS - APM-Hexseal
SEELRIVITS - APM-Hexseal
SEELSKREWS - APM-Hexseal
SEICO - Syscon Intl.
SEISMOPROBE - Bently Nevada
SEIS VIEW - EG&G Geometrics
SELECT-O-TEMP - Hexacon Electric
SELECTROL - Thermo Electric
SELECTRONIC - JMR Electronics
SELF-LOC-K - AirBorn
SELF-TUNE - Love Controls
SEL-MASQ - Sel-Rex
SEMCONN - MOLEX
SEMI/DYNE - LogiMetrics
SEMIPACK - Semikron
SEMISTACK - Semikron
SEMITRON - Bussmann:Cooper Industries
SENSABLE - Hy-Cal Engineering
SENSEFET - Motorola Semiconductor Prods.
SENSIMETER - Hy-Cal Engineering
SENSITOUCH - Bowmar Instrument
SENSOHM - Ferro Corporation
SENSORBEAD - Sensor Scientific
SENSORCHIP - Sensor Scientific
SENSOR-MATE - Weed Instrument
SENSORNET - Namco Controls
SENSORPROBE - Sensor Scientific
SENTARA 324 - Honeywell
SENTRILINE - Bird Electronic
SEQUENTORR - Sloan Technology Corporation
SERDEX MODULES - Analog Devices
SERENDIP - Teledyne Solid State
SERIES 5000 - Paso Sound Products
SERPAC - Serco Products :Serco Mold
SERVICEMASTER - International Components
SERVODISC - PMI Motion Technologies
SERV-RITE - Gordon :Watlow
SHAWMUT - Gould Shawmut
SHAWNEE - Automatic Timing & Controls
SHEAR-SEAL - Barksdale Controls
SHELF MATES - Speco
SHERLOCK - ACS Communications Systems
SHIELD CELL - Chomerics, :W.R. Grace
SHIELDMESH - Chomerics, :W.R. Grace
SHIELDSCREEN - Chomerics, :W.R. Grace
SHIELD TAPE - Chomerics, :W.R. Grace
SHIELD-VU - Chomerics, :W.R. Grace
SHIELD WRAP - Chomerics, :W.R. Grace
SHOCKWATCH - Media Recovery
SHOPSHEET - Telesis Controls
SHO RATE - Brooks Instrument
SHORT SQUEEK - E & L Instruments
SHOTSCOPE - Branden, T. G.
SHRINK-ABLE - ABL Electronics Supply
SHRINKDOWN - Markel
SIDACTOR - Teccor Electronics
SIDE WINDER - Stancor Products
SIGNAFAX - Alden Electronics
SIGNAGUARD - Signatron
SIGNALEX - Staver
SIGNALOCK - LogiMetrics
SIGNATURE - Bristol Babcock
SILASTIC - Dow Corning
SILCAD - Whittaker-Yardney Power Systems
SILENT PARTNER - Industrial Computer Designs
SILENTWRITER - NEC Information Systems
SILFIL - Elastomeric Technologies
SILFLEX - Furane Products
SILICA-SEAL - Ferro Corporation
SILIC-O-NETIC - Heinemann Electric
SILIC-O-RINGS - APM-Hexseal
SILIKROMES - APM-Hexseal
SILKON 35 - Chemtronics
SIL-PAD - Bergquist
SILVAINT - Murata Manufacturing , Ltd.

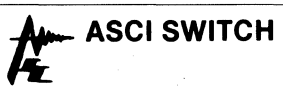
SILVERCAP - Del Elctrns.
SILVERCEL - Whittaker-Yardney Power Systems
SILVERFILM - Industrial Midwec Capacitor
SILVER-GRIP - PIC Design
SILVER II - RAYOVAC Corporation
SILVER-SHIELD - International Wire Products
SILVER STAR DELAYS - Television Equipment
SILVERSTAT - Edsyn
SILVER STAX - Elastomeric Technologies
SILVERWELD - Bourns
SILVREX - Sel-Rex
SIMULASER - Simulaser
SIMULINE - Comstron
SINE-UPS - Electronic Specialists
SINGLE-BRITE - Perma Power Elctrns.
S.I.R. - Geophysical Survey Systems
SIVICON - Amperex Electronic
SKAMP - Skan-A-Matic
SKAN-COAX - Skan-A-Matic
SKID-MATE - Hardigg Inds.
SKINI-DIP - MERET
SKINNY DIP - SFE Technologies
SKY CAP - AVX Corporation
SKYLARK - Lutron Electronics
SKY-TIE - Adalet-PLM Div
SLAPSHOT PULSERS - Plasma Research
SLEEV-SCRU - Augat/Pylon
SLENDYNE - Shure Brothers
SLIDELINE - Duncan Electronics
SLIDE LITE - Leecraft Mfg.
SLIM JR. - Hexacon Electric
SLIMPAC - Semtech
SLIMPAK - American Zettler
SLIM-SNAP - Sperry, A. W. Instruments
SLIM SR. - Hexacon Electric
SLIMSWITCH - Digitran
SLIM-TRACK - Barnes Engineering
SLIMVIEW - NES, (Nationwide Electronic Systems)
SLIP-LOCK - U.S. Terminals
SLIT-N-WRAP - Vector Electronic
SLO-BLO - Littelfuse
SLO-SYN - Superior Electric
SMART - Standard Microsystems
SMART BITE - Minelco - A Talley Ind.
SMARTDESCRETES - Motorola Semiconductor Prods.
SMARTECH - Burndy Corporation
SMART-LINE - Dataprobe
SMARTMOS - Motorola Semiconductor Prods.
SMARTSCOPE - Branden, T. G.
SMART SOURCE - Pacific Power Source
SMARTWORK - Wintek
SMD GRABBER - Pomona Electronics
SMD-TRON - Bussmann:Cooper Industries
SMOOTH CUBE - Quality Power Systems
SNAIL - Augat/Pylon
SNAP - Automatic Timing & Controls
SNAP-TAC - Membronics
SNAPAK - Airpax , Cambridge
SNAP CONNECTOR - Advanced Circuit Technology
SNAPFLEX - Bowmar Instrument
SNAPLITE - Leecraft Mfg.
SNAP-ON - Vibra-Metrics
SNAP-PAK - Waldes Truarc
SNAPSEELS - APM-Hexseal
SNAPSHOT - Bently Nevada
SNAP SINK - IMC Magnetics
SNAP STAT - Control Products
SNAP-TAINER TM - EG & G Birtcher
SNAPTRACK - Augat/RDI
SNAPTROL - CTS Corporation
SNAPTUBE - Zeus Indl. Prods.
SNIPE - Oak Switch Systems
SNOOP LOOP - Sencore
SOCKETRAC - Custom Connector
SOCKET-SERT - Hybricon Corporation
SOCKETS-PLUS - Perma Power Elctrns.
SOC-PAC - Elfab Corporation
SODEREZE - Phelps Dodge Magnet Wire
SODER-MASK - Solder Removal
SODER-WICK - Solder Removal
SODR-X-TRACTOR - Pace
SOFKEY - EECO
SOF SWABS - Clean Room Prods.
SOFTPOT - U. S. Digital
SOFT SHIFT - Lucas Ledex
SOFTY - Clauss Cutlery
SOGGY FOIL - Cornell-Dubilier Elctrns./Sangamo Comps.
SOLAR - E-Squared Technology
SOLAR INFRARED - Casso-Solar
SOLAR UNITUBE - Casso-Solar
SOLATRON/ACUVOLT - Sola
SOLDAPULLT - Edsyn
SOLDER-AID - OK Industries
SOLDEREX - Sel-Rex
SOLDER MASTER - Hexacon Electric
SOLDER-OFF - Kester Solder
SOLDERQUIK - Raychem
SOLDERSLEEVE - Raychem
SOLDERTACTS - Raychem
SOLDER-WRAP - Vector Electronic
SOLDR-MITE - Wall Lenk Corporation
SOLIDIZED - ABL Electronics Supply
SOLID-TUBES - Electronic Devices
SOLIDVIEW - Adage
SOLISTRAND - AMP
SOLOK - DuPont Electronics
SOLU BRIDGE - Beckman Industrial
SOLU CHEK - Beckman Industrial
SOLUCOMP - Beckman Industrial
SOLU METER - Beckman Industrial
SOL-U-SALT - Sel-Rex
SONABOX - Heat System
SONA GRAPH - Kay Elemetrics
SONALERT - Mallory Capacitor
SON-CASTER - Ansonics
SONICALL - Sonicall
SONICATOR - Heat System
SONIMIST - Heat System
SONOBAR - Shure Brothers
SONOCELL - Kistler-Morse
SONOLOGIC - Kistler-Morse
SONOWELD - Sonobond Ultrasonics
SON-TECTOR - Ansonics
SOOPERSPOOLER - Consolink
SORN - Sprague Electric
SOUNDCASTER - Paso Sound Products
SOUND DIRECTOR - Argos Prods.
SOUND MASTER - Speco
SOUND MATES - Speco
SOUND POWER - Vidaire Electronics Mfg.
SOUND SCENE - Shure Brothers
SOUND SCOPE - Shure Brothers
SOURCE - Fortron/Source
S-PAC - Reliability
SPACE MISER - Mepco/Centralab
SPADE-LOK - AMP
SPARK GUN - Vernitron Piezoelectric
SPASAVER - ITW Switches
SPECTRAGUIDE - SpecTran
SPECTRA SCAN - Photo Research:Kollmorgen
SPECTRATESTER - Spectral Dynamics
SPECTRAY - Leeds & Northrup, General Signal
SPECTROLINE - Spectronics
SPEECH DIRECTOR - Argos Prods.
SPEEDFOIL - Armstrong World Inds.
SPEEDIAL - Lutron Electronics
SPEEDIP - Mann, Henry
SPEEDOMAX - Leeds & Northrup, General Signal
SPEED-WRAP - OK Industries
SPHINCTER - Augat/Pylon
SPIKE-SPIKER - Kalglo Elctrns.
SPINGUARD - AVX Corporation
SPINWRITER - NEC Information Systems
SPIRADEL - Allen Avionics
SPIRALTRON - Galileo Electro-Optics
SPIRAL WELD - Fastex
SPIRAP - AMP
SPIRA-SHIELD - Magnetic Shield Corporation
SPIRFLAME - Solder Absorbing Technology (SAT)
SPLITFORM - Microtran
SPLIT/TRAN - Signal Transformer
SPOOLX - Algo
SPORTSMAN - RAYOVAC Corporation
SPOT CHECK - Pacific Transducer
SPOTMATIC - Auric
SPOTMETER - Photo Research:Kollmorgen
SPOT-ON - Multicore Solders
SPOX - MOLEX
SPRING LOC - Garry Electronics
SPRINGTER - Augat/Pylon
SPRING-THING - Southco
SPUTTER-RING - Temescal/Edwards High Vacuum Intl.
SPYRALINE - Alpha Metals
SQUARE-CUT - Amphenol RF Operations
SQUARESTIX - Aries Electronics
SQUINT-SKAN - Skan-A-Matic
S-SYSTEM - Electromatic Controls
STABELEX - Industrial Midwec Capacitor
STABILARC - ISOREG
STABIL-GLOW - Blue M, A Unit of General Signal
STABILINE - Superior Electric
STABIL-THERM - Blue M, A Unit of General Signal
STAB-L - Sprague-Goodman Elctrns.
STABLE-LOK - Zierick Manufacturing
STABON - Stackpole, Magnet
STAC K BIN - Stackbin
STACKBOX - Stackbin
STACKRACK - Stackbin
STACPAC - Semtech
STAKE FASTENER - Dupree
STAKELOCK - Middleberg Corporation/Middco Connectors
STAK'M QUIK - Brim Electronics
STAK PAK - Zippertubing
STALOK - Fastex
STANCAP - Stanley Electronics
STANCOR - Stancor Products
STANCOTE - Standard Wire & Cable
STANDARD CLIPPER - Mueller Elec.
STANDARD POWER - Acme Electric Corporation
STANFLEX - Standard Wire & Cable
STANOMERSE - Technic
STAPLE-PRUF - Carol Cable
STAR CHIP - Mepco/Centralab
STARDUSTER - Antenna Specialists
STARMASTER - Gandalf Data
STARPOINT PARALLELING - Qualidyne Systems
STAR PORT - Gandalf Data
STATES - Multi-Amp
STAT-GARD - Ideal Industries
STATICIDE - ACL
STATIC WATCH - Nu-Concept Systems
STATI-EX - Solder Absorbing Technology (SAT)
STAT-KON - LNP Engineering Plastics
STAT-O-GIDE - Bivar
STAT-O-MATIC - Nu-Concept Systems
STAT-O-SEAL - Parker Seal Grp.
STAT PRUF - Amherst International
STATUS SEEKER - Dataprobe
STAT VAC - Data-Design Labs.
STAVOLT - Christie Electric
STEDI-HEAT - Hexacon Electric
STEELGRIP - Alpha Metals
STEEL-TOUGH - Ideal Industries
STEMCO - United Technologies Control Systems
STENAFAX - Fitchburg Coated Products
STEREOHEDRON - Stanton Magnetics
STEREOWAFER - Stanton Magnetics
STEREOZOOM - Cambridge Instruments
STERILGARD - Baker
STETRON - Stetron International
STICKY FINGERS - Instrument Specialties
STICKY MAT - Controlled Environmental Equipment
STICPAC - Semtech
STIKI-BAK - Acme
STIK KLIPS - Daburn Electronics & Cable
STOPSLIP - Solder Absorbing Technology (SAT)
STRAINRITE - Star Porcelain
STRATE-BREAKS - Coors Ceramics
STRATO GREY - BayStat
STRATO-THERM - AMP
STRIPALL - Teledyne Kinetics
STRIPMASTER - Ideal Industries
STRIP-MOUNTS - Bivar
STRIP-N-STICK - CHR Industries
STRIPSWITCH - EECO
STRIPTROL - CTS Corporation
STRIPTWEEZ - Pace
STROBETTE - Ametek
STUK - Ambroid
STURDILITE - Kewaunee Scientific
STURDI-STAND - Hexacon Electric
STYLE-LITE - Zero
STYLINE - Vicon Industries
STYLUS - Point 4 Data
SUB-LITE-WALL - Zeus Indl. Prods.
SUB-OUNCER - United Transformer : of Opt Industries
SULFAMEX - Sel-Rex
SUNCAP - Baknor Industries
SUN GUN - GTE Sylvania Lighting
SUN STICK - GTE Sylvania Lighting
SUNVERTER - Abacus Controls
SUN WIPE - Clean Room Prods.
SUPERBRIDGE - Motorola Semiconductor Prods.
SUPER CAESAR - ITT Cannon:Military/Aerospace
SUPERCAP - Baknor Industries
SUPER CHAMP - AMP
SUPERCHIPS - American Technical Ceramics Corporation
SUPERCLUSTER - Paracom
SUPERCON - Superior Electric
SUPERCONDUCTING DIPSTICK - American Magnetics
SUPER-D - Cinch Connector
SUPERFAST - Cinch Connector
SUPERFAST - Semtech
SUPERFLOOD - GTE Sylvania Lighting
SUPER-GRAPH - Aremco Products
SUPERGUIDE - Fiberguide Industries
SUPERIBBON - Cinch Connector
SUPERINTENDENT - Heuristics
SUPERLITE - United Foam Plastics
SUPERMIUM - Brush Industries
SUPER MOD - Cinch Connector
SUPERNOL - Aerovox
SUPER-PLAST - Stock Drive Products
SUPERPLOT - Gulton Graphic Instruments
SUPERPORT - International Instrumentation
SUPER PULSER - Skan-A-Matic
SUPER PUNCH - Shure Brothers
SUPER/REG - Trio Laboratories
SUPER SNAP - Mepco/Centralab
SUPER-SOURCE - Temescal/Edwards High Vacuum Intl.
SUPERSTRATE - Materials Research Corporation
SUPER-SUN - Pacific Microcomputers
SUPERSWITCH - Baknor Industries
SUPERSWITCHER - Powertec Power Supplies
SUPER-SYNCLAMPS - Timber-Top
SUPER-TORQUE - Beede Electrical Instrument
SUPERTRAK - Gulton Graphic Instruments

SUPERTRENDS - Heuristics
SUPER-TWISTAGUIDE - Airtron
SUPER/UNI - RTE Power/Mate
SUPER VISION - Litton Poly-Scientific
SUPRASHIELD - Alpha Wire
SURE-HOLD - Sencore
SURE-LOCK - Pacific Electricord
SURE-SEAL - ITT Cannon:Military/Aerospace
SURE SITE - Gems Sensors
SURE-TWIST - Amphenol RF Operations
SURFACE STACK - Teledyne Kinetics
SURFBOARD - E & L Instruments
SURFCAP - Sprague-Goodman Elctrns.
SURFCOIL - Sprague-Goodman Elctrns.
SURFILM - ITW Paktron
SURFMATE - Burndy Corporation
SURFTRIM - Sprague-Goodman Elctrns.
SURGE GARD - Ketema/Rodan
SURGE MASTER - MCG Elctrns.
SURGE-SAFE - Acme Transformer
SURGISTOR - Stetron International
SURGITRON - Joslyn Electronic Systems
SURMETIC - Motorola Semiconductor Prods.
SURMOUNT - Micro Electronic Systems
SWEMAR - Leader Instruments
SWIDGET - CW Industries
SWIFT - RCD Components
SWIFTACHMENTS - Dennison Mfg.
SWING-SEAL - Jamesbury
SWITCH-A-ROO 232 - International Instrumentation
SWITCHCARE - DOW SWITCH
SWITCHGUARD - Qualidyne Systems
SWITCHMASTER - Master Electronic Controls
SWITCHMODE - Motorola Semiconductor Prods.
SWITCHMUX - Gandalf Data
SWITCH-PAK - Computer Products
SWITCH PLUS - General Semiconductor Ind.
SWIVEL-BLADE - Ideal Industries
SWIVLTOP - Moody Tools
SY-LENT - Berg, W. M.
SYLGARD - Dow Corning
SY/MAX - Square D
SYNAMP - CML MACARR
SYNCHROMATIC - Schott Glass Technologies
SYNCHRON - IMC Magnetics
SYNCHROSTEP - PMI Motion Technologies
SYNCHROVISION - Schott Glass Technologies
SYNCLAMPS - Timber-Top
SY/NET - Square D
SYNTHAR - Industrial Midwec Capacitor
SYNTHINOL - Consolidated Electronic Wire & Cable
SYNTHITE - Dolph, John C.
SYSNET - Syscon Intl.
SYSTEM FAULHABER - Micro Mo Electronics
SYSTEM ONE - Audio Precision
SYSTRON - Systron-Donner Inertial
TABL-TOP - Sel-Rex
TACHLITE - Ametek
TACH-PAK - Airpax , Sensor
TACH-TROL - Airpax , Sensor
TACTIFLEX - Bowmar Instrument
TAFALOY - Tafa
TAG-RING - Glenair
TAIL/EXTENDER - Com/Tech Systems
TAK-ETTE - Ametek
TAK/SHIELD - C.A.M. Graphics
TAMELOX - Ohmtek
TANDEM - RAYOVAC Corporation
TANDEMOUNT - Fastex
TANFILM - International Resistive
TANITE - Sprague Electric
TANKARD - Automatic Timing & Controls
TANTALEX - Sprague Electric
TANTAMOUNT - Sprague Electric
TANTAPAK - Sprague Electric
TANTIN - International Resistive
TAPE CABLE - BRIntec
TAPE/FOIL - Tapecon
TAPE PAK - Ideal Industries
TAPER-CLAMP - Amphenol RF Operations
TAPOLENE - Tappan Wire & Cable
TA'POT - Howell Instruments
TARNIBAN - Technic
TATTLE TALE - Onset Computer
TATTLETHERM - Everest Interscience
T-DOT - Anaren Microwave
TEACHWARE - LJ Technical Systems
TEAM SYSTEMS - Team Systems
TEAM SYSTEMS - Toyo Spectrum
TEC-CUT - Techni-Tool
TECH - Altek
TECHCLEAN - Tech Spray
TECHANCELL - Altus Corporation
TECHNICART - Leader Instruments
TECH-TIN - Technic
TECKAIRE - Tecknit (Eastern Facility)
TECKSHIELD - Tecknit (Eastern Facility)
TECKSTIK - Tecknit (Eastern Facility)
TECKSTRIP - Tecknit (Eastern Facility)
TECLAB - Kalamazoo Technical Furniture
TEC-TAC - Techni-Tool
TEC-TUFF - Techni-Tool
TEENY-TINY-MITE - LH Research
TEFLON - ICO-RALLY Corporation
TEGLAR - Andrew
TEL-A-TONE - Bell, Floyd
TELCOM-PAC - Reliability
TELEDISPLAY - Telegenix
TELE-LINE - Perma Power Elctrns.
TELEMAX - Thermax Wire
TELEMETROLL - Bristol Babcock
TELE-PAC - Elfab Corporation
TELEPROM - Global Technology International
TELESPIKER - Kalglo Elctrns.
TELESPONDER - Vega Precision Labs.
TELE-SPOT - NEI Ferranti-Packard Electronics
TELE-TEST - Bytex
TELFLEX - Chemtronics
TELLEM - Infinetics
TEMPCAL - Howell Instruments
TEMPCUBE - Digital Dynamics
TEMPEREX - Sel-Rex
TEMPGARD - Tenney Engineering
TEMPILABELS - Tempil
TEMPILAQ - Tempil
TEMPILSTIK - Tempil
TEMP-MASTER - Blue M, A Unit of General Signal
TEMP-O-GIDE - Bivar
TEMPOSONICS - Temposonics
TEMP-R-GLAS - CHR Industries
TEMP-R-TAPE - CHR Industries
TEMPSISTOR - Midwest Components
TEMP STAR - Thermo Electric
TENNTROL - Tenney Engineering
TENSILE-FLEX - International Wire Products
TENSOL-THERM - Tensolite
TENULINE - Bird Electronic
TERM-ACON - Methode Electronics
TERMALINE - Bird Electronic
TERMALUM - AMP
TERMAPOST - Raychem
TERMASHIELD - AMP
TERMI-BLOK - AMP
TERMI-FOIL - AMP
TERMI-GRID - AMP
TERMINUS - Litton Poly-Scientific
TERMINYL - AMP
TERMI-PLATE - AMP
TERMI-POINT - AMP
TERMI-TWIST - AMP
TERMO - Panduit
TEST-GLO - Ideal Industries
TESTPAC - Multi-Amp
TEST-TOP - Everett/Charles Contact Products
TETCO - Electric Tachometer
TETRA-CRIMP - AMP
TETRA-ETCH - W. L. Gore
TETRA-THIN - W. L. Gore
TETRINOX - Caddock Electronics
TEXTUR TOUCH - C.A.M. Graphics
THE BIG SIGNAL - Unadilla Antenna Mfg.
THE BLACK HOLE - International Instrumentation
THE BOS/S - Electronic Measurements
THE BUS MASTERS - Comark
THE FERRET - General Electric
THE GREAT PROTECTORS - United Foam Plastics
THE HANDLERS - Paso Sound Products
THE HORN - Gabriel Electronics
THE ICE-HOUSE - Metalink Corporation
THE IMPERSONATOR - Direct Aid
THERMACON - Dexter Research Ctr.
THERM-AL - Acme
THERMAL BLOCK - Quality Power Systems
THERMALBOND - Thermalloy
THERMAL CLAD - Bergquist
THERMALCOTE I - Thermalloy
THERMALERT - Raytek
THERMALEZE N - Phelps Dodge Magnet Wire
THERMALFILM - Thermalloy
THERMALSIL - Thermalloy
THERMASPLICE - AMP
THERMAZIP - Zippertubing
THERMCOAT - Omega Engineering
THERMILINEAR - Yellow Springs Instrument
THERMIVOLT - Yellow Springs Instrument
THERMO-CABLE - Thermo Electric
THERMOCHUCK - Temptronic Corporation
THERMOCOMP - LNP Engineering Plastics
THERMOFLAG - Staver
THERMO-GRIP - Ideal Industries
THERMOHM - Leeds & Northrup, General Signal
THERMO-HUNTER - Capintec Instruments
THERMOLAIN - Star Porcelain
THERMOLIMIT - Raychem
THERMOPAD - Motorola Semiconductor Prods.
THERMOPART - Pace
THERMOPLASTIC ELASTOMERS - Monsanto
THERMO PRO - L & L Special Furnace
THERM-O-SCOPE - Capintec Instruments
THERMO-SHRINK - Ideal Industries
THERMO SOCKET - Temptronic Corporation
THERMOSPOT - Temptronic Corporation
THERMOSTREAM - Temptronic Corporation
THERMO-STRIP - Ideal Industries
THERMOTAB - Teccor Electronics
THERMOTERM - Maury Microwave
THERM-O-TRAC - Hexacon Electric
THERMOVANE - Staver
THERMOWATT - Motorola Semiconductor Prods.
THERMOZONE - Temptronic Corporation
THERMSTRATE - Power Devices
THE SMART TELEPHONE SYSTEM - Solid State Systems
THE STATES COMPANY - Multi-Amp
THINISTOR - Victory Engineering
THINKING CAP - Global Specialties
THINLAY - Handy & Harman Elctrn. Matls.
THINPAK - American Zettler
THINPANEL - IEE (Industrial Electronic Engineers)
THIN-TRIMS - Johanson Manufacturing Corporation
THINVERTER - Arnold Magnetics
THIN-WALL - Berg, W. M.
THIRSTY WIPE - Clean Room Prods.
THORKOM - Viking Connetors
THREDS - Southco
THREDSEAL - Parker Seal Grp.
THREE-FIVE SYSTEMS, INC. - Three-Five Sys.
THRIFT/MATE - GTE Sylvania Lighting
THRIFTSWITCH - IEE (Industrial Electronic Engineers)
THRULINE - Bird Electronic
THRU-PASS - Sprague Electric
THUMB MITE - Tech Laboratories
THYRISTROL - Cross Electronics
THYZORB - General Semiconductor Ind.
TIEMASTER - Mann, Henry
TIGOLD - ULVAC North America Corporation
TILTAR - Dova Controls
T.I.M. - Miniature Metal Forming
TIMEFAX - Fitchburg Coated Products
TIMEMARK - Fitchburg Coated Products
TIMEPAC - Timeplex
TIMEPRINT - Fitchburg Coated Products
TIME SOURCE - Precision Standard Time
TIME/VIEW - Timeplex
TINEON - Leecraft Mfg.
TINITRON - Bussmann:Cooper Industries
TINNIT - Datak
TINY-GLOW - Industrial Devices
TINYMAX - Torwico Elctrns.
TINY-PAK - Mini-Systems
TINY TRIM - Kappa Networks
TISSUMIZER - Heat System
TI-TITE - Daburn Electronics & Cable
TKO - Teka Interconnection Systems
TLC CABLES - Optical Cable
T-LITE - Sylvania Miniature Lighting
TMOS - Motorola Semiconductor Prods.
TOE - Electro-Support Systems
TOF - Electro-Support Systems
TOGGLE-DIP - Grayhill
TOOLHEAD - Southco
TOP FLIGHT - Data Translation
TOP-SLOT - Aries Electronics
TORMAX - IMC Magnetics
TORQSYN - Vernitron Controls
TORQ TITE - CW Industries
TORQUE WATCH - Waters Manufacturing
TOUCH DRY - Markem
TOUCH-HOLD - John Fluke Mfg.
TOUCH-PEN - Sun-Flex
TOUCH-TEST - Sencore
TOUCHVIEW - C.A.M. Graphics
TRA-BOND - Tra-Con
TRA-CAST - Tra-Con
TRACE CONTROL - Gould
TRACER-FLO - Trio-Tech International
TRAKFET - Analog Devices
TRANCELL - Koep Precision Standards
TRANS-BOX - Flambeau Products
TRANSCAP - Tusonix
TRANS-EYE - Shelly Associates
TRANSFILTER - Vernitron Piezoelectric
TRANSHEAT - BTU International, BTU Systems
TRANSITAINER - Zero
TRANSLOCK - Surgeonics Limited
TRANSNUBBER - Powercube
TRANSTERM - Computerwise
TRANSVOLT - Guildline Instruments
TRANSZORB - General Semiconductor Ind.
TRA-PAX - Tra-Con
TRA-PRIME - Tra-Con
TRASAR - Andrew
TRA-SEAL - Tra-Con
TRA-STRIP - Tra-Con

TRC ICE POINT - Omega Engineering
TREADWRITER - Telesis Controls
TREELOK - Fastex
TREND SETTER - Acurex /Autodata
TRIAX - Monsanto
TRIDUNDANT - LNR Communications
TRIFURCON - MOLEX
TRIGARD - Joslyn Electronic Systems
TRIGGER LOCK - Hartwell
TRIGOMET - International Machine & Tool
TRIGON - Temescal/Edwards High Vacuum Intl.
TRIG-R-HEAT - Wall Lenk Corporation
TRIMCAP - Murata Manufacturing , Ltd.
TRIMIT - Bourns
TRIM KIT - American Technical Ceramics Corporation
TRIMLINE - ESC Electronics
TRIMPOT - Bourns
TRIMSTRIPS - Southco
TRINITAR - Alan Gordon Entprs.
TRI-ONIC - Gould Shawmut
TRIPLATE - Alpha Industries
TRIPLE FLEX - Shure Brothers
TRIPLEGARD - Joslyn Electronic Systems
TRI-POINT - Automatic Switch
TRI-ROUNDULAR - Fastex
TRI-STATE BOX - Electro Standards Lab.
TROLEX - CTS Corporation
TRON - Bussmann:Cooper Industries
TRUARC - Waldes Truarc
TRU/BLU - Timeplex
TRU-CAL - EDL
TRUE ANGLE - Stock Drive Products
TRUE BLUE - PIC Design
TRUE GRID - Houston Instrument
TRUE METRIC - Stock Drive Products
TRUE-POWER - Acme Electric Corporation
TRUE VIEW - Lance Industries
TRUFLEX - Texas Instruments
TRU-GLIDE - Jonathan Manufacturing
T-SOFT - Taurus Computer Products
T-TRON - Bussmann:Cooper Industries
TUBE-PAC - Semtech
TUFCON - W. L. Gore
TUFF CHIP - Sprague Electric
TUFFCOTE - Tensolite
TUF-FLEX - Pacific Electricord
TUFFLITE - Tensolite
TUFF-TAINER - Flambeau Products
TUF STUF - Clean Room Prods.
TUF-TIES - Amrad & Transcon Mfg.
TUNER RUNU - Chemtronics
TUN-O-POWER - Chemtronics
TUN-O-WASH - Chemtronics
TURBO - BRIntec
TURBOCRYL - BRIntec
TURBOGLAS - BRIntec
TURBOLEX - BRIntec
TURBO-PROBE - EG & G Flow Technology
TURBOSIL - BRIntec
TURBO-SLOT - IMC Magnetics
TURBOSOL - BRIntec
TURBOTHERM - BRIntec
TURBOTUF - BRIntec
TURBOZONE - BRIntec
TURBULA - Glen Mills
TURNER - Cooper Tools
TUTORETTE - Audiotronics
TU-WIRE - Lutron Electronics
TWIN-CAP - American Technical Ceramics Corporation
TWINCHESTER - Genisco Memory Prods.
TWINGLE - Gimix
TWIP - Edsyn
TWISTAGUIDE - Airtron
TWISTITE - MWS Wire Industries
TWIST-LITE - Eaton /MSC Products
TWIST-LOK - Sprague Electric
TWIST-PROTECT - Electronic Specialists
TWIST TIES - Brim Electronics
TY-ABLE - ABL Electronics Supply
TYKON - Cinch Connector
TYPEX - Square D
TYTEX - Exide Corporation
U C-PROBE - International Instrumentation
ULTIBOARD - Ultimate Technlg.
ULTI-MATE - Victor Elec. Wire & Cable
ULTIMAX SURVEYOR - Humphrey
ULTRA-BEAM - Banner Engineering
ULTRA-AMP - Banner Engineering
ULTRA-CHIP - Wilbrecht Electronics
ULTRA COMPACT - United Transformer : of Opt Industries
ULTRA-GOG 300 - American Ultraviolet
ULTRA-GROUND - Topaz
ULTRAGUARD - EPE Technologies
ULTRA-H - Hy-Cal Engineering
ULTRA-HI Q - Rutherford Research
ULTRA-ISOLATOR - Topaz
ULTRALLOY - Arco Electronics
ULTRA-LOC - BEI Motion Systems
ULTRA MITE - Thermo Electric
ULTRAN - Schott Glass Technologies
ULTRA-PAC - A.L.E. Sys.
ULTRAPURE - Kester Solder
ULTRA-QUITE - Micronel U.S.
ULTRAR - Atomergic Chemetals
ULTRA-SEAL - Alpha Metals
ULTRA-SHIELD - ABL Electronics Supply
ULTRA-SLIM - Micronel U.S.
ULTRA-SMART - Micronel U.S.
ULTRA-SOL - Alpha Metals
ULTRA-SPEC 100 - American Ultraviolet
ULTRA-STRATES - Accumet Engineering
ULTRA-TECH - Mueller Elec.
ULTRA-TEMP - Aremco Products
ULTRATORCH - Master Appliance
ULTRAVOX - Paso Sound Products
ULTRA-7 - Hy-Cal Engineering
ULTREX - Canada Wire and Cable Limited
ULTROL - BRIntec
UNGARMATIC - Ungar
UNIBLOC - Motorola Semiconductor Prods.
UNI-CHIP - Fenwal Electronics/APD
UNICOAT - Bacon Industries
UNI-CORE - Alpha Metals
UNI-COVER - Amherst International
UNI-CURVE - Fenwal Electronics/APD
UNIDELTA MARK II - Yokogawa of America
UNIDYNE - Shure Brothers
UNI-FACTOR - Computer Products
UNI MAG - EG&G Geometrics
UNIMEC - MEC A/S
UNIMORPH - Vernitron Piezoelectric
UNIPLY - Power Designs
UNIRAY - MCE Semiconductor
UNIRING - Burndy Corporation
UNI-RON - Shure Brothers
UNI-ROTOR - Astro Dynamics
UNISENS - Scientific Technologies
UNISERT - Unicorp
UNISLIDE - Velmex
UNISPHERE - Shure Brothers
UNISYSTEM - Pacific Microcomputers
UNI-TERM - American Technical Ceramics Corporation
UNIT/PAK - Motorola Semiconductor Prods.
UNITRACK - Unitrack Industries
UNITWIST - Jan Hardware Mfg.
UNITY - Bytex
UNIVAR - Sprague Electric
UNIVERSAL DATA LANGUAGE - Hand Held Products
UNIVERSE/200 - Charles River Data Systems
UNIWATT - Motorola Semiconductor Prods.
UNIWELD - Endicott Coil
UNIWRITER - Red Square
UNOS - Charles River Data Systems
UNREEL - Belden Wire and Cable
UPOWER - Interpoint Corporation
URESOLVE - Dynaloy
UTIFLEX - Micro-Coax Components
UTILI*COM - Regency Land Mobile
UTILI-TAP - AMP
UTILI-TENSHUN - AMP
UV-TRAN - Schott Glass Technologies
UV TRON - Hamamatsu Photonics K.K.
VACOIL - Transene
VACOMATIC - Vaco Products
VACOMBO - Vaco Products
VACOTOTAL - Vaco Products
VACPAC - Hull
VAC-PIC - SC Technology
VACREL - DuPont de Nemours, E. I.
VACTROL - EG & G Vactec
VACULOY - Alpha Metals
VACUTEC - Atomergic Chemetals
VAGABOND - Shure Brothers
VAL-AN - Zero
VALIDATE - Applied Microsystems
VALU-BEAM - Banner Engineering
VALUSWITCHER - Powertec Power Supplies
VALUTRAN - Micron Industries
VANTAGE POINT - Industrial Computer Designs
VAPORFLO - Tenney Engineering
VARAD - Shure Brothers
VARA-TEMP - Hexacon Electric
VARAX - Adtech Power
VAREO - Lutron Electronics
VARIAC - Technipower, A Penril
VARICOUNTER - Veeder-Root
VARIDAC - Perkin-Elmer
VARILITE - Taliq
VARIOCUT - ELVO: of Zumbach Electronics Corporation
VARI-SYNC - Colorgraphic Communications
VARITEMP - Master Appliance
VARITRIM - Voltronics Corporation
VARITRON - Power-Science
VARI-TWIST - Belden Wire and Cable
VARI-VAC - Vactronic Lab. Equip.
VARY-TALLY - Veeder-Root
VCAR - Eveready Battery
VECTORBORD - Vector Electronic
VECTOR-PAK - Vector Electronic
VELOCIMITE - Vibra-Metrics
VELOSTAT - Static Control Systems/3M Electrical
VENDACARD - XCP
VENDACODER - XCP
VENT-RAK - General Devices
VERAFLEX - Shure Brothers
VERGER - Alpha Metals
VERI-DRIVE PLUS - Todd Products
VERIGRAPH - International Instruments:APrime Technology
VERNISTAT - Perkin-Elmer
VERNITORQ - Vernitron Controls
VEROBLOC - BICC-VERO Electronics
VEROBOARD - BICC-VERO Electronics
VEROBOX - BICC-VERO Electronics
VEROCASE - BICC-VERO Electronics
VEROLOCK - BICC-VERO Electronics
VERORACK - BICC-VERO Electronics
VEROWIRE - BICC-VERO Electronics
VERSACAD - Versacad Corporation
VERSACAGE - Unitrack Industries
VERSA-CAL - Biddle Instruments
VERSACON - Teradyne Connection Sys.
VERSA-CRIMP - Square D
VERSAMOUNT - Unitrack Industries
VERSAPLEX - Lutron Electronics
VERSA-PROBE - EDL
VERSA-RANGE - Blue M, A Unit of General Signal
VERSA-TEMP - EDL
VERSATENN - Tenney Engineering
VERTI-LYTIC - Sprague Electric
VERTISOCKETS - Aries Electronics
VERT-O-GIDE - Bivar
VET-THERM - Everest Interscience
VHSICON - Teradyne Connection Sys.
VIBRALARM - Vibra-Metrics
VIBRALERT - Metrix Instrument
VIBRALOG - Metrix Instrument
VIBRA LOK - CINCH Cylindrical
VIBRAMIKE - Alpha-M
VIBRAMITE - Vibra-Metrics
VICOAX - Vicon Industries
VIDAIRE - Vidaire Electronics Mfg.
VIDEOBRIDGE - Electro Scientific Industries, (ESI)
VIDEO LAB - Data Translation
VIDEOLINK - Vicon Industries
VIDEOMASTER - Lance Industries
VIDEOPAC - Densepac Microsystems
VIDEO STICKS - Chemtronics
VIDEOTENN - Tenney Engineering
VIDEOWINDOWS - New Media Graphics
VIDOMET II - Penn Video
VIEWVAC - Temescal/Edwards High Vacuum Intl.
VIK-STIX - Viking Connetors
VINYL STIX - Topflight
VINYLUG - Burndy Corporation
VIP - Welcon/Wells
VIRTRONICS - VirTis
VISCOFILM - Industrial Midwec Capacitor
VISICORDER - Honeywell
VISICOUNTER - Veeder-Root
VISIDAQ - Electronic Associates
VISI-GUARD - Joslyn Electronic Systems
VISI-PITCH - Kay Elemetrics
VISTAL - Coors Ceramics
VITACOTE - ESICO/TRITON
VITEL - Viking Connetors
VITR-AU-LESS - Ferro Corporation
VITROLAIN - Star Porcelain
VIVISUN 20/20 - Aerospace Optics
VMEPROM - Eyring Research Inst.
VOCAL MASTER - Shure Brothers
VOICE DIRECTOR - Argos Prods.
VOICEGATE - Shure Brothers
VOICE MASTER - Covox
VOL-CON - Ideal Industries
VOLPI TRONIC - Volpi-MFG-USA
VOLTMETER HI-Z - Ross Engineering
VOLTPROBE - Amprobe Instrument
VOLTRONICS - Voltronics Corporation
VOLTSENSOR - Calex Mfg.
VOL-U-METER - Brooks Instrument
V-PAC - Reliability
VPS 324 - Vicon Industries
VSTAR - Varian Microwave Equip.
VUE - National Information Systems
VUEPOINT - General Digital
VYCOR - Corning Glass Works
VYDYNE - Monsanto
VYLINK - BRIntec
WAFERGUIDE - SC Technology
WAFER-SPHERE - Jamesbury
WATERWEB - Heat System
WATER WELDER - Henes Products
WATTCHER - Bird Electronic
WAT-TROLLER - Glenro
WATTSHAVER - Solid State Systems
WATTS-ON - Tech Laboratories
WAVEGUARD - Krohn-Hite
WAVELABS - Systron-Donner Inertial
WAVEMETER - Burleigh Instruments
WEDGE-LOK TM - EG & G Birtcher
WEECOIL - Syscon Intl.
WEECON - Tusonix
WEGGER INSULATION TESTERS - Biddle Instruments
WEIGHFLOW - Kistler-Morse
WEIGHLITE - Kistler-Morse
WELDOHM - Belden Wire and Cable
WELLER - Cooper Tools
POWERITE P - Sencore
WESTACH - Westberg Manufacturing (WESTACH)
WESTAT - Wescorp Antistatic Products
WET-SPEC - Electrol

WHETSTONE - Integrated Digital Products
WHISPERCABLE - Thermax Wire
WHITE BOX - Omega Engineering
WHITE JACKET - Sprague Electric
WHYTE BOX - Omega Engineering
WILBRAZ - Wilkinson
WILD ROVER - Electronics Research Associates
WING-NUT - Ideal Industries
WIRE-LUBE - Ideal Industries
WIREMATE - Burndy Corporation
WIRE NUT - Ideal Industries
WIREPLIER - Vaco Products
WIREPOST - Burndy Corporation
WIRE PREPPER - Ideal Industries
WISS - Cooper Tools
WITE BOX - Omega Engineering
WONDER MASK - Tech Spray
WONDER WIPE - Clean Room Prods.
WORKHORSE - RAYOVAC Corporation
WORLD-CHIP - Advanced Micro Devices
WRAP-CAP - Ideal Industries
WRAPOST - Autoswage Products
WYBAR - Eraser
WYTE BOX - Omega Engineering
XACTEMP - Gordon :Watlow
XACTGLAND - Gordon :Watlow
XACTHEAD - Gordon :Watlow
XACTLOK - Gordon :Watlow
XACTOHM - Gordon :Watlow
XACTPAK - Gordon :Watlow
XACTSEAL - Gordon :Watlow
X-AIR - Furane Products
X-BLOCK - Precision Interconnect
XCELITE - Cooper Tools
X-DUCER - Motorola Semiconductor Prods.
XECON POLASTRIP - Chomerics, :W.R. Grace
XENOLITE - Christie Electric
XERSIN - Multicore Solders
X-OLENE - Okonite
X-STATIC - Illinois Lock
XTRADUR - Hexacon Electric
XTRA-GUARD - Alpha Wire
XYMOX - Brady, W. H.
YELLOW JACKET - Sprague Electric
YELLOW 77 - Ideal Industries
YEWFLO - Yokogawa of America
YEWMAG - Yokogawa of America
YEWPACK MARK II - Yokogawa of America
ZAP STRAP - International Instrumentation
Z-COMM - Z Communications
ZEBRA - Tecknit (Eastern Facility)
ZEBRA - Zebra Technologies Corporation
ZELRAD - Judd Wire
ZEPHER - Berkeley Nucleonics
ZEPPELIN - Alan Gordon Entprs.
ZERO AMP - Spectra Sonics
ZERO BACKLASH - Waters Manufacturing
ZERODUR - Schott Glass Technologies
ZERO PAK - Zero
ZERO-PLY - Zero
ZERO QUIP - Zero
ZERO-TRAK - Zero
ZESTRON - Cosar Corporation
ZETAPOR - CUNO
ZIFLEX - Burndy Corporation
ZIFTAC - Hypertronics
ZIP-IN - Equipto
ZIPPERTUBING - Zippertubing
ZIP.R TRIM - Motorola Semiconductor Prods.
ZIP STRIP - 3M-Electronic Products
ZIPTAPE - Zippertubing
Z-NET - Ziatech
ZORB - General Semiconductor Ind.
Z-PAC - Reliability
Z-SWITCH - Motorola Semiconductor Prods.
ZYINDEX - Zylab Corporation
ZYLAB - Zylab Corporation

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
AAK Corp	Acon, Inc.	Advanced Analog Intech	Aeroflex Laboratories Inc. ARX, Inc.
AAVID Engineering, Inc.	Acopian	Advanced Circuit Technology	Aerospace Optics, Inc.
Abacus Controls Inc.	Action Instruments	Advanced Components Inds., Inc. Spitznagel GmbH	Aerotech, Inc.
ABB Metrawatt	Active Control Instrumentation	Advanced Control Sys.	Aerovox Inc.
Abbott Technologies, Inc. Burbank Division, Transformers	Acurex Corp./Autodata Div.	Advanced Electronic Packaging	AES Corp.
Abbott Transistor Labs Power Supplies	ADAC Corp.	Advanced High Voltage Co.	Aetna Engineering
ABL Electronics Supply, Inc.	Adage, Inc.	Advanced Input Devices	Aiphone
ACC Electronics Company Echlin Inc.	Adams Rite Products, Inc.	Advanced Interconnections Corp.	AirBorn, Inc.
Accessories for Elctrns., Inc.	Adams-Russell Anzac Div.	Advanced Linear Devices, Inc.	Airflyte Elctrns. Co.
Acculex Corporation MetraByte	Adaptive Networks	Advanced Micro Devices	Air Maze Corp.
Accuprobe, Inc.	Adatek, Inc.	 Advanced Systems Concepts	Airpax Co., Cambridge Division
Accuride	ADC Telecommunications, Inc.	Ad-Vance Magnetics, Inc.	Airpax Co. Cheshire Div.
ACDC Electronics Div. of Emerson	Additive Products Div. Kollmorgen Corp.	Advantest America, Inc.	Airpax Co. Frederick Div.
ACL Inc.	Advance A Unit of Zero Corporation	A E G Corporation	Air-Vac Engrg.
Acme Electric Corporation	Advance Conversion Devices Co.	A E G Corporation Telefunken Semiconductors Div.	AKG Acoustics, Inc.

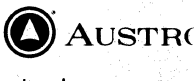
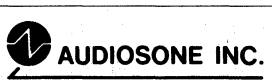
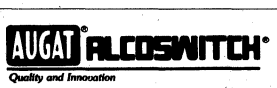
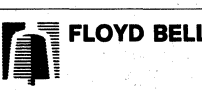
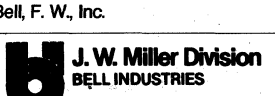
LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Akro-Mils	Alpha-M Corporation Alpha-M Corp.	american automation American Automation	american technical ceramics corp. American Technical Ceramics Corporation
ALDEN Alden Products Co.	Alpha Metals	AMERICAN CONTROL TECHNOLOGY American Control Technology, Inc.	American Zettler
Alden Systems Co. Alden Systems Alden Products Co.	Alpha Products, Inc.	CYANAMID American Cyanamid Co. Metal Coated Fibers Dept.	ORIONICS Ametek Controls Div. Ametek Fiber Optic Products
a.l.e. systems, inc. A.L.E. Sys., Inc.	alpha Alpha Wire Corp.	cycom MCG FIBER PRODUCTS American Cyanamid Co. Metal Coated Fibers Dept.	AMITRON American Micro-Tronix Inc. AMITRON American Micro-Tronix, Inc.
Alexander Batteries By Alexander Manufacturing Alexander Manufacturing Company	ALPS OEM Alps Electric (USA), Inc.	AEL American Electronic Laboratories, Inc.	Amkey Amkey
ALGO Algo, Inc.	ALTAIR Altair Exchange Corporation	AEI American Electronics	amlan inc. Amlan, Inc.
ALLEN AVIONICS, INC. Allen Avionics, Inc.	Altech Corp. Altech Corp.	AMERICAN American HV Test Systems Inc.	AMP AMP
AB ALLEN-BRADLEY A ROCKWELL INTERNATIONAL COMPANY Allen Bradley Co., Electronic Components Div. A Rockwell International Co.	ALTEK Altek Co.	A LEVITON COMPANY AMERICAN INSULATED WIRE CORP American Insulated Wire Corp. Leviton Mfg. Co.	Amperex® Amperex Electronic Company A Div. of North American Philips Corporation
RGA Allen Co., Inc., Robert G.	ALTEK Corporation ALTEK Corporation	ALS American Laser Systems, Inc.	Amphenol® Amphenol Corporation Corporate Headquarters
ALLEN Allen Datagraph, Inc.	altus CORPORATION Altus Corporation	AMI American Magnetics	Amphenol® RF Amphenol RF Operations Amphenol Corporation
Allied Control® Relays Allied Control Div. of Telemanique, Inc.	AII AMBER INDUSTRIES, INC. Amber Inds., Inc.	AMS American Microsemiconductor, Inc.	Amphenol SPECTRA-STRIP Amphenol/Spectra Strip
A Allied Systems Corp.	amco® Amco Engineering	AMERICAN MICROWAVE TECHNOLOGY INC. American Microwave Technology, Inc.	AMPLIFIER RESEARCH Amplifier Research
ALLIGATOR TECHNOLOGIES Alligator Technologies	AMECON Amecon, Inc.	American Relays, Inc. American Relays, Inc.	 Amprobe Instrument Core Industries, Inc
ALL-STATES All-States, Inc.	AME AME Corporation	AMERICAN RESEARCH & ENGINEERING American Research & Engineering	amuneal MANUFACTURING CORP. Amuneal Manufacturing Corp.
alpha data Alpha Data Inc.	AAC American Aerospace Controls	ASC American Switch Corp.	ANALOG DEVICES Analog Devices, Inc.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Analog Equipment Corporation	Antel Optronics Inc.	Applied Software Tech., Inc.	Artel Communications Corp.
Analogic Corp.	Antex Electronics Corp.	Arcolectric Corp.	ASC
Analogic/3H	A. P. Circuit	Arc Systems, Inc.	ASM Corporation
Analog Modules, Inc.	APEC Fiber Optics Corp.	A.R.F. Prods.	Associated Circuits Inc.
Anaren Microwave	Apex Microtechnology Corp.	ARGA Controls	Associated Electronics & Mfg. Corp.
Anco Elctrns. Pan Intl.	API-Arstan Products International Inc.	Argos Prods.	Associated Research, Inc.
AND William J. Purdy Co.	Apollo Magnetics Corp.	Aries Electronics	Associated Spring, Barnes Grp.
Andersen Laboratories	Appleton Papers Inc.	Arium Corporation	Astro-Geo-Marine, Inc.
Anderson Power Products Div. of High Voltage Engineering	Applied Controls Co., Inc.	Ark Elctrns. Corp.	Astromec, Inc.
Andon Elctrns. Corp.	Applied Data Systems	Armbar Industries, Inc.	Astromec, Inc.
Andrews Bearings Ina Bearing Company, Inc.	Applied Engineering Products	Arnold Magnetics	Astro-Med, Inc.
Andrews Bearings Ina Bearing Company, Inc.	Applied Micro Circuits Corp.	Aromat Corp.	Astron Corp.
Ango Electronics Corp.	Applied Microsystems Corp.	Array Analysis, Inc.	Astrosystems
Angstrohm Precision, Inc. A Sub of Vishay Intertechnology	Applied Plastics Technology	Arrow Fastener	Astro Tool Co., Inc.
Anritsu	Applied Power Conversion Technology Dynamics, Inc.	Arrow Hart Components Cooper Industries	A-Systems Inc.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
AT&T Microelectronics	Ault, Incorporated	Avtel Div., Unitron Inc.	Basic Measuring Instruments
Atec, Inc.	 Austron, Inc.	Avtel Div., Unitron Inc.	Battery Engineering, Inc.
Athena Controls, Inc.	Automatic Coil Corp. Sub. Designatronics, Inc.	AVX Corporation	B-D Crystal Entprs., Inc. Subsidiary of HY-Q Int'l
Atlantic Scientific Corporation	Automatic Timing & Controls Co.	Axial Magnetics Tencal Inc.	Bead Electronics Div. Bead Industries, Inc.
Atlas Energy Systems Charles E. Smith Co., Inc.	Automation Unlimited Icon Corporation	Babcock, Inc.	Beau Products Div. Vernitron Corp.
Atlas/Soundolier	Automotion, Inc.	Babcock Display Products, Inc. A Subsidiary of Babcock, Inc.	Beckman Industrial Corp. Subsidiary of Emerson Electric Co.
Atlee Inc.	Autoroll Machine Corporation	Bailey Controls Co. Div. of Babcox & Wilcox	Beckman Industrial Corp. Subsidiary of Emerson Electric Co.
Atomergic Chemetals Corp.	Autosplice, Inc.	Ballantine Laboratories, Inc. Sub. of E.S.I. Inc.	Beede Electrical Instrument Co., Inc.
ATV Research, Inc.	Autoswage Products	Ball Corp., Efratom Division	BEI Motion Systems Co. Corporate Off.
Audio Precision, Inc.	Avantek, Inc.	Balston	Belden Wire and Cable Cooper Industries
 Audiosone, Inc.	Avel-Lindberg Inc.	B & B Motor & Control Corp. B & B Long Island City	Bel Fuse
Augat Inc.	Avex Electronics	B & K Precision Maxtec International Corp	Bel Fuse
 Augat Alcoswitch Augat Inc.	Avibank Manufacturing, Inc.	Barber Colman Co. (A Siebe Co.) Motor Division	 Bell, Floyd, Inc.
Augat, Inc. Interconnection Products Group	Avionic Instruments	Barksdale Controls Div. Imo Delaval Inc.	Bell, F. W., Inc.
Augat/RDI	Avtech Electrosystems Ltd.	Barnes Engineering Div. EDO Corporation	 Bell Inds. J. W. Miller Div.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Bellofram Corporation	BICC-VERO Electronics, Inc.	Bosch, Robert, Corp.	Brush Fuses Inc.
Bellofram Corporation	Bicron Electronics	Boschert, Inc. Computer Products/Boschert	Brush Industries Inc.
Belting Industries Co., Inc.	Bird Electronic Corp.	Bourns, Inc. Resistive Components Group	Bubbl-Tec
Bently Nevada Corp.	Bit 3 Computer Corporation	Bourns, Inc. Resistive Components Group	Buckeye Stamping Co.
Bergquist	Bivar, Inc.	Bowmar Telecommunications Div.	Buehler Products, Inc.
Berkeley Nucleonics Corp.	Blatek, Inc.	Bradford Electronics, Inc.	Burgess Switch Co. American Electronic Components
Berkeley Process Control, Inc.	BLH Electronics, Inc.	Brailsford & Co.	Burleigh Instruments
Berk-Tek Inc.	Bliley Electric Co.	Branmag, Inc.	Burling Instruments
Bertan Assocs.	Blue M, A Unit of General Signal	Breeze-Illinois TransTechnology Corp.	Burr-Brown Corp.
Bertsch U.S.	Bodine Electric Company	Brentek International, Inc.	Bussco Inc.
Best Power Technology, Inc.	Bogen Communications, Inc. MPD Products	Bren-Tronics, Inc.	Bussmann:Cooper Industries
Best Technology Inc.	Bogen Communications, Inc.	Bren-Tronics, Inc.	Bytex Corp.
Bey Electric, Inc.	Bonar Kard-O-Lite, Inc.	Brim Electronics	Bytex Corp.
B-G Instruments, Inc.	Boonton Electronics Corp.	BRIntec Corp. Brand-Rex Cable Systems Division	Cabtron Systems, Inc.
BH Electronics, Inc.	Bopla Enclosures	Brooks Instrument Div. Emerson Elec. Co.	CAC Microcircuits Inc. Bel Fuse

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Caddell-Burns Mfg.	C.A.M. Graphics Co., Inc.	Carter Motor	Charles River Data Systems, Inc.
Caddell Coil Corp.	Canada Wire and Cable Limited	Catalyst Research Mine Safety Appliances Co., Inc.	Chatsworth Data Corporation
Caddock Electronics, Inc.	Canadian Thermoplastics Op., Ferro Corp. Ferro Indl. Prods. Ltd. Thermoplas.Div.	Catalyst Research Mine Safety Appliances Co., Inc.	ChemRex Inc. ResTech Prods. Div.
Calex Mfg. Co., Inc.	C & C Jetronic, Inc.	Catalyst Research Mine Safety Appliances Co., Inc.	Chemtronics Inc.
Calibron Instruments Burton-Rogers Co.	C & K Components, Inc.	Caton Connector Corp.	Chemtronics Inc.
California DC	C & K/Unimax, Inc. C & K Components, Inc.	CBM America Corp.	Cherokee International, Inc. Core Industries
California Eastern Labs. Inc.	Canon U.S.A. Elctrn. Comps. Div.	CDRL Data, Inc.	Cherry Electrical Products Cherry Corporation
California Instruments Amstar Electronics Group	Canyon Elctrns.	Celesco Transducer Prods., Inc.	Chessell Corp.
California Micro Devices, Inc.	The Carborundum Company Electronic Ceramics	Central Data Corp.	Chesterfield Products
California Microwave	Caristrap Internatonal, Inc.	Centronic, Inc. Morgan Crucible Co., Electronics Div.	Chicago Laser Systems, Inc.
Calmark Corp.	Carlingswitch, Inc.	Ceramaseal	Chicago Lock Co.
Calmos Semiconductor, Inc.	Carol Cable Co. Inc.	Ceramaseal	Chomerics, Inc.:W.R. Grace & Co.
Cambridge Aeroflo, Inc.	Carol Cable Co. Inc.	CGTI	CHR Industries, Inc. Fluorcarbon Co.
Cambridge Aeroflo, Inc.	Carroll Touch, Inc.	Champion Technologies, Inc.	Christie Electric Corp.
C.A.M. Graphics Co., Inc.	Carrot Components Corporation	Charles River Data Systems, Inc.	Chromalox Instrs. & Controls

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Chrono-log Corp.	Codar Technology, Inc.	Compact Power Company	Computer Products Inc. Power Conversion
CICOIL CORP.	Codenoll Technology Corp.	Compact Power Company	Computerware, Inc.
Cinch Connector Division Labinal Components & Systems Inc.	Coherent General, Inc.	Compar D.G.W. Electronics Corporation	Comstron Corp.
Cincinnati Sub-Zero Prods.	Coilcraft	Component Mfg. Svc., Inc.	Conap, Inc.
Cipher Data Prods., Inc.	Colber Corp.	Component Research Co. Inc.	Concord Electronics Corporation
Cirris Systems	Cole Hersee Co.	Components Corp.	Condenser Products Corp.
Clairex Electronics Clairex Corporation	Cole Instrument Corp.	Components Unlimited, Inc.	Condor D.C. Power Supplies, Inc.
C.P. Clare Corp.	Collmer Semiconductor, Inc.	Computalker Compuvoice, Inc.	Condor Systems, Inc.
C.P. Clare Corp.	Colorado Crystal Corp.	Computer Components, Inc.	Conklin Instrument Corp.
Clarke-Hess Communications Research Corp.	Colorado Crystal Corp.	Computer Conversions Corp.	Connector Corp.
Clarostat Mfg. Co., Inc. Hawker Siddeley, PLC.	Comclok, Inc.	Computer Dynamics Sales	Connor-Winfield Corp.
Clarostat Mfg. Co., Inc. Hawker Siddeley, PLC.	Comlinear Corp.	Computer Maintenance Corp.	Conrac Display Products, Inc. A Mark IV Industries Co.
Clifton Precision Litton Systems, Inc.	Comm/Scope, Inc. Network Cable Div.	Computer Optical Products, Inc. Sub. of Hathaway Corp.	Consolidated Electronic Wire & Cable
CML MACARR A Marine Electric Systems Co.	Communications Instruments, Inc.	Computer Peripherals Inc.	Contaq Technologies Corp.
Coaxial Dynamics	Compac	Computer Power Inc.	Control Cable, Inc.

LOGOFINDER DIRECTORY

Logo / Mfr.	Logo / Mfr.	Logo / Mfr.	Logo / Mfr.
Control Electronics Control Electronics Neurotech Corp.	CP TECHNOLOGY, INC. 21143 Christensen Dr. Cupertino, CA 95014 CP Technology, Inc.	C-TEK INCORPORATED C-Tek Inc.	CVC PRODUCTS, INC. CVC Products, Inc.
Controlled Environmental Equipment Corp.	CRAIG SYSTEMS Subsidiary of Kidde, Inc. KIDDE Craig Systems Corp. Hanson Industries	CTI electronics CTI Electronics	CW INDUSTRIES CW Industries
CONTROLLED POWER COMPANY Controlled Power Co.	CRAMER COMPANY Cramer Co.	CTS CORPORATION* CTS Corporation	Cybernetic Micro Sys.
CSI Control Sciences, Inc.	Creare Inc.	CTS CORPORATION* BERNE DIVISION CTS Corp., Resistor Network Div. (Formerly CTS Corp., Berne Div.)	CyberPak company Cyberpak Co.
CTC Control Technology Co., Inc.	CMS Creative Micro Systems	FI CTS Corporation Systems Division	CYTEC CORP. CYTEC Corp.
CONVERTER CONCEPTS INC Converter Concepts, Inc.	CRISSMAN MANUFACTURING COMPANY Crissman Manfacturing Co.	CTS Computer Terminal Systems, Inc. COMMACK, NEW YORK CTSI International Inc.	DABURN Daburn Electronics & Cable Corp.
Converter Concepts, Inc.	CRITERION Criterion Instrs., Ltd.	CURRENT RING Current Ring Co. Inc.	dage Dage Precision Industries, Inc.
Cooner Wire Co.	cb METAL FABRICATORS Cross Brothers, Inc.	CURRENT Technology Current Technology, Inc.	DAICO INDUSTRIES, INC. Daico Industries, Inc.
Coors CERAMICS Coors Ceramics Co.	CROSSPOINT THE LIGHTED DISPLAY DIVISION INFO-LITE CORPORATION Crosspoint Div. of Info-Lite	CURTIS INDUSTRIES, INC. Curtis Industries	DALE® Dale Electronics, Inc. Columbus Div.
CORBY Corby Industries, Inc.	Crouzet® Crouzet Controls, Inc.	CURTIS Curtis Instruments, Inc.	DAMON Damon Electronics Div.
corcom Corcom, Inc.	CROVEN Croven Crystals	Custom Cable Corp. Custom Cable Corp.	D & B POWER, INC. D & B Power, Inc.
CDE CORNELL DUBILIER Cornell-Dubilier Elctrns./Sangamo Comps.	CRYDOM COMPANY Crydom Company	CMS Custom Micro Systems Custom Micro Systems, Inc.	DMC DANIELS MANUFACTURING CORPORATION Daniels Manufacturing Corp.
COTO CORPORATION Coto Corporation	Cryomagnetics, Inc.	CUSTOM POWER SYSTEMS, INC. Custom Power Systems	dataCon DataCon, Inc.
covox inc. Covox, Inc.	CSI Capacitors CSI Capacitors CSI Technologies	CSI Custom Sci. Instrs.	data delay devices, inc. Data Delay Devices
CPS CPS, Inc.	CSTS COMPUTER SYSTEMS TECHNICAL SUPPORT CSTS	CUT CRAFT, INC. Cut Craft, Inc.	DATAK Datak Corp.

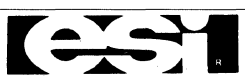
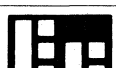
LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Datapower Inc. Power Systems Div.	Deltec Corporation A Fiskars Co.	Digital Products, Inc.	Dova Controls
Dataproducts New England, Inc.	Deltrol Controls	Digitran Division Xcel Corporation	Dover Electronics Manufacturing
Data Race, Inc.	Deltron, Inc.	Dillon, W. C. Weigh-Tronix, Inc.	Dow Corning Corp.
Data Rentals/Sls., Inc	Densitron Corporation Densitron International	DILOG	Dow-Key Microwave Corporation
Data Technology, Inc.	Design Components, Inc.	Dionics	Dowty RFL Inds. Inc./Instrumentation Div. The Dowty Grp. PLC
Datatran Corp.	Detroit Testing Laboratory, Inc.	Dio-Rey Div. of Info-Lite	Dranetz Technologies, Inc.
Datel, Inc.	DEVAR, Inc.	Disc Instruments Honeywell	Dreefs Switch, Inc.
Datron Systems, Inc.	DeYoung Manufacturing, Inc.	Distributed Processing Technlg. Corp.	Dreefs Switch, Inc.
Datum Inc. Timing/Aacom Divisions	Dialight Corp. A Cambridge Elctrns. Inds. Co.	Diversified Technlg.	DSA, Inc.(Dai-Ichi Shoji of America) Div. of Leader Instruments
DCI Inc.	Dianachart Inc.	Diversified Technlg.	DSA, Inc.(Dai-Ichi Shoji of America) Div. of Leader Instruments
Dearborn Wire & Cable, Inc.	Di/An Controls, Inc.	Dixson, Inc.	DSA, Inc.(Dai-Ichi Shoji of America) Div. of Leader Instruments
DEK Inc.	Diego Power	Doran Manufacturing Co.	Dubbeldee Harris Diamond Corp.:D. Drukker & Zn. N.V.
Del Elctrns. Corp.	Dielectric Labs.	Doran Manufacturing Co.	Dukane Corp. Communications Sys. Div.
Delevan Div. American Precision Inds. Inc.	Digital Dynamics, Inc.	Dormeyer Inds. A. F. Dormeyer Mfg. Co., Inc.	Duncan Electronics, Inc.
Delta Products Corporation	Digital Electronics	Douglas Randall	DuPont de Nemours, E. I., & Co.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
DURACELL® Duracell Inc.:OEM Sls. & Mktg.	EAO Eastern Air Devices, Inc.	EG&G JUDSON EG & G Judson	ELECTRICAL INSTRUMENT SERVICE Electrical Instrument Service
DURAKOOL INC An American Electronic Components Company Durakool, Inc. American Electronic Components	EAD Eastern Air Devices, Inc.	EG&G RETICON EG&G Reticon Div. of EG&G	ELECTROCHEM INDUSTRIES Electrochem Industries Wilson Greatbatch Ltd.
DY-4 DY-4 Systems Inc.	Eberhard Eberhard Mfg. Co., Div. Eastern Co.	EG&G VACTEC EG & G Vactec	Electrocom Electrocom Industries
DYMEC Dymec Silicon Transistor Corp.	ebm ebm Industries, Inc.	EG&G WAKEFIELD ENGINEERING EG & G Wakefield Engineering	ELECTRO CORPORATION Electro Corporation Sub. of Fasco Industries Inc.
dynacircuits inc. Precision Printed Circuit Boards Dynacircuits Inc.	EBY EBY Company	EI&S EI & S Corporation	Electrocube
DYNAGE Power Dynage/Power & Magnetics Division Of Oakleaf, Inc.	Ectron CORPORATION Ectron Corp.	Eichhoff Electronics	ELECTRODYNAMICS Electrodynamics, Inc. A Talley Inds. Co.
Dynamics Div. of Waugh Controls Corp.	EDAC Edac Inc.	EI Microcircuits, Inc.	Electro-Dynamics Dev. Co.
DYNAMICS Dynamics Div. of Waugh Controls Corp.	EDL, Inc.	EIP Microwave, Inc.	EF μ/Δt Ω Electrofilm
DYNAPOWER CORPORATION Dynapower Corporation	DIPLOMAT SOLDAVAC® Edsyn, Inc.	Elantec, Inc.	ELECTRO-FILMS Electro-Films, Inc.
Cromemco® Dynatech Computer Company	EECO® EECO Incorporated	ELASTOMERIC TECHNOLOGIES, INC. Elastomeric Technologies, Inc.	ELECTRO FORCE Electro Force Corp.
Dynatech COMPUTER POWER, INC. Dynatech Computer Power, Inc.	EFI CORPORATION 350 WEST 2700 SOUTH P.O. BOX 15358 SALT LAKE CITY, UTAH 84115 PHONE (801) 486-5871 EFI Elctrns.	Elcom Industries, Inc.	Electro IMPULSE, INC. Electro Impulse
EAGLE Eagle	EG&G ALMOND INSTRUMENTS EG & G Almond Instruments	Elcom Systems, Inc.	Electro Industries Electro Industries Div. E.I. Elctrns., Inc.
EAGLE MAGNETIC Eagle Magnetic Company, Inc.	EG&G BIRTCHER EG & G Birtcher EG & G, Inc.	ELCON PRODUCTS INTERNATIONAL COMPANY Elcon Products International Company	ELECTROL Elec-Trol, Inc.
EAGLE PICHER ELECTRONICS DIVISION Eagle-Picher	BIRTCHER EG & G Birtcher EG & G, Inc.	ELDEC Eldec Corp. Monitor & Control Div.	ELECTROL Electrol Co.
Eagle Signal Controls:A Mark IV Inds. Co.	EG&G GAMMA SCIENTIFIC EG&G Gamma Scientific Div. of EG&G Inc.	Electrac, Inc.	EMP. inc. ELECTRO-MAGNETIC PROCESSES, INC. Electro-Magnetic Processes, Inc.:Member of ISC Defense & Space

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Electromatic Controls Corp.	Electronic Precision Components Corporation	Electro Vector, Inc.	Eltec Instruments Inc.
Electromech, Inc.	Electronic Research Co.	Elfab Corporation Augat, Inc.	Eltec Instruments Inc.
Electro-Mechanisms, Inc.	Electronic Resources Inc.	Elgar Electronics Corporation	Eltrol Corporation
Electro-Mech Co.	Electronic Solutions A Unit of Zero Corp.	Elgar/Intepro Systems	EMCA/ROHM & HAAS
Electronic Applications Co.	Electronic Space Systems Corp.	Elgenco, Inc.	EMCO HIGH VOLTAGE CO. EMCO High Voltage Co.
Electronic Components Groupe Stein Industries, Inc.	Electronic Specialty Corp.	Elgin Electronics Combustion Engineering	E/M Corporation
Electronic Components Groupe Stein Industries, Inc.	Electronics Research Associates Inc.	ELLIOTT JORDAN Elliott/Jordan A Sub. of Vishay Intertechnology	**Emcor Products** Emcor Products Crenlo, Inc.
Electronic Concepts, Inc.	*APPLIED RESEARCH* Electronic Systems Div. Servo Corp. of America	ELMA Electronic Inc.	EMDS, Inc.
Electronic Controls Design	Electronics Systems, Inc.	Elma Engineering	Emerson Computer Power
Electronic Development Associated, Inc.	Electrorack Products Co.	ELMEC Technology of America	Empro Manufacturing Company, Inc.
Electronic Development Corp. EDC	 Electro Scientific Industries, Inc. (ESI)	Elmwood Sensors	E.M.S. Div. of Sandberg Industries
Electronic Devices, Inc.	Electro Space Fabricators	Elpac Components Elpac Electronics, Inc.	Emulation Technology, Inc.
Electronic Enclosures Div. Wyle Labs	Electrospace Systems, Inc.	Elpac Power Systems Elpac Electronics, Inc.	 Enclosure Corp.
Electronic Measurements	Electroswitch Unit of Electro Switch Corp.	Elpaz Instruments, Inc.	Endevco
Electronic Measurements	Electroswitch, Southern Div. Electro Switch Corp.	Elpaz Instruments, Inc.	Endicott Research Group

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Enerco, Inc.	Epsco	Eveready Battery Co. Inc.	Fair-Rite Prods.
Energy, Ltd.	Epson America, Inc./OEM Div.	Eveready Battery Co. Inc.	Faria, Thomas G., Corp.
Energy Systems	Equipto Electronics Corp.	Everest Electronic Equipment	FDK America, Inc. Fuji Electrochemical Co., Ltd.
Engineered Assemblies Corp.	Eraser Co.	Everlight - USA	FEI Microwave, Inc. Frequency Electronics, Inc.
Engineered Components Co.	Ericsson Components, Inc.	Evox-Rifa Inc.	Fema Elctrns. Corp.
ENI, Inc. Emerson Electric Co.	Erni Components	EWC, Inc.	Fenwal Electronics/APD Kidde, Inc.
Enprotech Corp.	Escap Products	Exact Electronics Div. of Dynatech Nevada Inc.	Ferranti Interdesign, Inc.
EnTech Corporation	ESC Electronics Corp.	Exatron Automatic Test Equip.	Ferranti Venus, Inc. Ferranti International
Entech Systems, Inc.	E-T-A Circuit Breakers	Excel Technology Intl. Corp.	Ferranti Venus, Inc. Ferranti International
Entran Devices	ETI Systems Polaris Indl. Entprs.	Excelta Corporation	Ferraz Corporation
EPC Identification Sys.	ETI Systems Polaris Indl. Entprs.	Eyring Research Inst., Inc.	Ferraz Corporation
EPC Identification Sys.	ETM Electromatic Inc	E-Z Hook Tektest Inc.	Ferretec Inc.
E.P.D./General Power Corp.	ETRI, Inc.	Fabricast	Ferroxcube Amperex Electronic Corp.
EPD Electronics, Inc.	Eubanks Engineering	Fagor Electronic Components, Inc., Natl. Mktg. Sls. Offs. Fagor Electrotecnica S. Coop.	Fiberoptic Systems, Inc.
Epoxy Technology, Inc.	Eubanks Engineering	Fairchild Weston Systems, Inc. CCD Imaging Division	FIC Corp.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Fifth Dimension, Inc.	FMC Corporation Chemical Products Grp.	Fujitsu Microelectronics, Inc. Sub. of Fujitsu Limited	General Cable Co.
Fil-Coil Company, Inc.	Force, Inc.	Furman Sound, Inc.	General Devices Co., Inc.
Filter Concepts Inc.	Foundation Instruments Inc.	Furman Sound, Inc.	General Devices Co., Inc.
Filtron Co., Inc. Sub. of ARX Inc.	Foxboro/PCG The Foxboro Company	Fusion Inc.	General Industries
Filtron Co., Inc. Sub. of ARX Inc.	Fox Electronics	Gage Applied Sciences Inc.	General Microwave Corporation
Fischer Connectors	FREED Megohmmeters See Industrial Test Equipment	Gamma-f Corp. Electromagnetic Sciences, Inc.	GENERAL POWER CORPORATION
Fischer Connectors	Frequency and Time Systems, Inc. DATUM, INC.	Gamma High Voltage Resch. Inc.	General Resistance A Prime Technology Company
FISHERCAST Fisher Gauge Limited	Frequency Control Products, Inc. American Time Products Div.	Gardiner Solder Co. Div. of Gardiner Metal Co.	General Scanning
Fiskars Electronics Corporation	Frequency Devices, Inc.	Gasket Dynamics, Inc.	Genicom Corp.
Flex-Core Div. Morlan & Assocs., Inc.	Frequency Electronics, Inc.	Gates Energy Products	Genisco Memory Prods. Corp.
Flex-Key Corp. Sub. of Astronics Corp.	Frequency Selective Networks	Gemini	GENROCO, Inc.
FLEX-LINK Products, Inc.	FTS Systems, Inc.	Gems Sensors Division IMO Delaval Inc.	Genstar Rental Electronics, Inc.
Flextronics, Inc.	Fujitsu America, Inc. Computer Products Group	Gems Sensors Division IMO Delaval Inc.	Gentron Corp.
Flotek Corporation	Fujitsu America, Inc. Computer Products Group	Genco Precision Corp.	Georator Corp.
John Fluke Mfg. Co., Inc.	Fujitsu of America	Genco Precision Corp.	Gettys an AEG Company

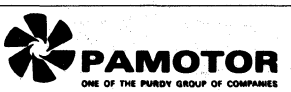
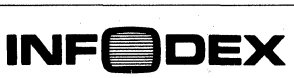
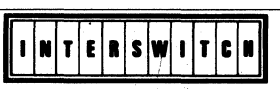
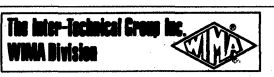
LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
GGB Industries, Inc. Picoprobe Division	Gould Inc. Corporate Headquarters	Hamlin	Hauman, Inc.
Giddings & Lewis Electronics A Unit of AMCA International	Gould Inc. Foil Div.	Hamlin	Haydon Switch & Instrument
Gilway Technical Lamp	Gowanda Electronics Corp.	Hamlin LCD A Div. of Standish Inds.	HBM, Inc.
Gimix, Inc.	Gralex Industries	Hammond Manufacturing Co.	HC Power Inc.
Gimix, Inc.	Graphite Metallizing Corp.	Hancock Electronics Corp.	HDS Inc.
Glasgal Communications, Inc.	Grayhill Inc.	Hancock Electronics Corp.	HDS Inc.
Glassman High Voltage Inc.	Greenray Inds., Inc.	Hand Held Products, Inc.	Headway Research, Inc.
Glenro, Inc.	Greibach Instruments Div.	H & L Instruments	HEI, Inc. Optoelectronics Div.
Global Technology International, Inc.	Grim Corporation	Harowe Servo Controls, Inc.:A Fasco Co.	Heinemann Electric Co.
Globe Plastics	Grimes Company	Harrel, Inc.	Hermetic Switch
Globtek, Inc.	GSI Corp.	Harris Corp. Computer Systems Div.	Hewlett-Packard Co.
Golden Pacific Electronics, Inc	GTE Products Corporation Miniature Lighting Products	Harris Semiconductor	Hexacon Electric Co.
Good-All Electric, Inc.	Guildline Instruments	Hartwell Corp.	Hexacon Electric Co.
Gordon Co.:Watlow	Hacker Instruments	Hasco Components, Inc.	Heyco Molded Products, Inc.
W. L. Gore & Assocs., Inc.	Haefely Test Systems E. Haefely & Co. LTD.	Hathaway Corporation:Motion Control Div.	Hibbing Electronics Corp.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
High Technology Sensors, Inc.	Hoffman Engineering	Humphrey, Inc.	IERC
High Voltage Technology Inc.	Hoffman Engineering	Huntington Electric Inc.	IET Labs, Inc.
HILEVEL Technology	Hoffman Engineering	Hurst Manufacturing Corp. Emerson Elec. Co.	ILC Data Device Corp.
Hipotronics Inc.	Holaday Industries, Inc.	Hybricon Corporation	Illinois Capacitor, Inc.
Hi-Q Crystals Hybrids International Ltd.	Hold-Heet Products Corp.	Hybrids International Ltd. Thick Film Division	Illinois Lock Co. The Eastern Co.
Hiram Jones Electronics	Hollingsead International	Hybridyne, Inc.	Illinois Lock Co. The Eastern Co.
Hirose Electric U.S.A. (HRS) Div. of Hirose Electric Co. Ltd. (Japan)	Holmberg Elctrns.	Hycomp, Inc.	Image Graphics, Inc.
Richard Hirschmann of America Inc.	Holt Inc.	Hypertech Corporation	Imaging & Sensing Technology Corp.
Hisonic, Inc.	Homalite, Inc.	Hypertronics Corp.	I.M.C. (International Microtronics Corp.)
Hitachi Denshi America Ltd. Test & Meas. Div.	Hopkins Engrg.	ICC, Inc.	IMC Magnetics Corp. Exec. Off.
Hi-Tech Components Mitsubishi International Corp.	Howard Industries, Inc.	ICS Electronics Corp.	IM/D Corp.
Hi-Tech, Inc.	Hughes Aircraft Co. Industrial Products Division	Idea, Inc.	Imperial Astronics Meridian Intl. Corp.
Hitran Corporation	Hughes Microelectronics Circuits Division	IDEC Corporation	Indek Corporation
HMW Enterprises, Inc.	Hull Corp.	IEC Electronics	Industrial Computer Designs, Inc.
Hobson Bros.	HumiSeal Div. CHASE Corporation	IEE (Industrial Electronic Engineers)	Industrial Control Co.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Industrial Devices Corporation	Inmos Corp.	Interface Engineering Inc.	International Power D.C. Power Supplies Inc.
Industrial Devices, Inc.	Innovus	Interfan William J. Purdy Co.	International Power Devices Inc.
Industrial Drives A Kollmorgen Div.	Instant Board Circuits Grp.	 Interfan William J. Purdy Co.	International Power Sources, Inc.
Industrial Electronic Hardware Corp. (IEH Corp.)	Instrulab	Inter-Market	International Rectifier Corp. Semiconductor Div.
Industrial Test Equipment	Instrumentation & Control Sys. ICS.Inc.	Inter Metro Industries Corp.	International Resistive Company
Industrial Test Equipment	Instruments for Industry, Inc.	International Components Corp.	International Sensor Systems, Inc.
Industrial Test Equipment	Instrument Specialties Co. Instrument Specialties Co.	International Crystal Mfg.	International Transducer Corp. Channel Technologies, Inc.
Infodex, Inc.	Intaq Electrotouch Sys. GM Nameplate, Inc.	International Electro Magnetics, Inc.	Interoptics Purdy Group
 Infodex, Inc.	Integrated Device Technology, Inc.	International Instrumentation, Inc.	Interpoint Corporation
Information Transfer Indl. Inc.	Integrated Power Designs, Inc.	International Instruments:APrime Technology Company	 Interswitch Wm. J. Purdy Co.
Information Transfer Indl. Inc.	Intelligence Power Technology	International Machine & Tool Corp.	 Inter-Technical Group Inc. WIMA Div.
Injectorall Electronics (Woman Owned)	Intelligence Power Technology	International Manufacturing Services	Intronics, Inc.
Inland Motor/Kollmorgen	Interaction Systems Inc.	International Microelectronic Prods.	ISC Datacom ISC Defense & Space
Inland Motor/Kollmorgen	Interactive Computer Products, Inc.	International Microsystems	ISKRA Electronics, Inc.
Inland Motor Kollmorgen Corp.	Interelectronics Corp.	International Polarizer, Inc.	ISL Products Int'l, Ltd.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Isotemp Research, Inc.	Jaro Components, Inc.	JM Transformer Co., Inc.	KAPPA/VIZ Test Equipment
Itek Encoder	Jayco Plastics of California, Inc.	Jobmaster Corp.	Kaut & Bux Manufacturing Co.
ITT Components ITT Corporation	JBM Electronics, Inc.	Johanson Dielectrics	Kavlico Corp.
ITT Schadow	J-B-T Instruments, Inc.	Johanson Manufacturing Corporation	Kay Elemetrics Corp.
ITT Sealectro	JDK Controls, Inc.	Jolo Industries, Inc.	KDI/Triangle Electronics
ITW Fastex Distributor Business	Jensen Tools, Inc. Axia, Inc.	Jori Resources	Keltec Florida, Inc., Microwave Pro Amstar Electronics Group
ITW Paktron Div. of Illinois Tool Works	Jerome Industries Corp.	Judco Mfg. Inc.	Keltron Corp. High Voltage Power Supply Div.
ITW Switches Illinois Tool Works	JETA Power Systems, Inc.	Judd Wire Inc.	Keltron Corp. Miniprinters Div.
IVO Industries, Inc.	Jettron Products Inc.	Julie Research Labs.	Kelvin Industries, Inc.
IXYS Corp.	Jewell Electrical Instruments	Jumo Process Control, Inc.	Kemet Electronics Corporation
JAE Electronics Inc.	JFW Industries, Inc.	Kaiser Systems, Inc.	Kentron, Inc.
Jaico Products Jaidinger Mfg. Co., Inc.	JKL Components Corporation	Kalamazoo Technical Furniture	Kepco, Inc.
James Electronics	JMJ Technical Prods.	Kalmus & Assocs., Inc.	Keptel/Armiger
Janco Corp.	JMK, Inc.	K & M Electronics	Kessler-Ellis Prods.
Jan Hardware Mfg. Co.	JM Transformer Co., Inc.	Kappa Networks, Inc.	Kester Solder Div. Litton Sys., Inc.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Kester Solder Div. Litton Sys., Inc.	KOA Speer Electronics	Lake Shore Cryotronics, Inc.	Leepoxy Plastics, Inc.
Ketema/Rodan Division	KOA Speer Electronics	Lambda Semiconductors Veeco Instruments	LEMO U.S.A., Inc.
Ketema/Rodan Division	Koep Precision Standards, Inc.	Lamb Industries, Inc.	LEM/Rekco
Keystone Carbon Thermistor Div.	Kontron Elctrns.	Lamb Industries, Inc.	LEM/Rekco
Keystone Electronics Corp.	Kooltronic, Inc.	Lamptronix Co., Ltd.	Lenco Elctrns., Inc.
KeyTek Instrument Corp.	Kraft Dynatronix, Inc.	Lansing Instruments Corp.	Leviton Telcom Leviton Manufacturing
KGS Electronics, Inc.	KR Electronics, Inc.	Law, R. E. Instrument, Inc.	Leybold Inficon Inc.
Kikusui International Corp.	Kristel Corporation	L-Com Inc.	LH Research, Inc.
Kilo International	KRL/Bantry Components, Inc.	LDJ Incorporated	LH Research, Inc.
Kilovac Corp.	Krohn-Hite Corp.	Leach Control Products Div. Leach Corporation	Liberty Controls
Kinemetrics/Systems Kinemetrics, Inc.	Krystinel Corp.	Leach Relay Division Leach Corporation	Light Control Systems Inc.
Kinetic Systems Corp.	K-Systems of Texas, Inc.	Leader Instruments Corp.	Lightning Protection Corp.
Kistler-Morse	Kulite Semiconductor Prods., Inc.	Lear Siegler, Inc. Telecommunications Div.	Lightwave Communications, Inc.
KMC Systems, Inc.	KYCON CABLE & CONNECTOR, INC.	Ledtronics, Inc.	Lincoln Laser Co.
KNIGHTFIRE TECHNOLOGY	Kyocera Northwest Electronic Components Group	Leeds & Northrup, General Signal	Lindgren RF Enclosures, Inc.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Linear Technology Corp.	Logic Beach Inc.	LZR Electronics, Inc.	Maida Development Co.
Line Electric Products	Logitek, Inc.	Mabuchi Motor America Corp.	Malco Systems THORN EMI
Line Electric Products	Logitek, Inc.	Machine Components Corp.	Malco Systems THORN EMI
Linseis, Inc.	Loral TerraCom Sub. of Loral Corp.	Mac Panel Co.	Mallory Capacitor Co. Emhart Elctrl./Elctrn. Grp.
Lite-On Inc.	Love Controls Corp.	Macrodyne	Manage, Inc. Fibre Optics Elctrns. Sys. Grp.
Littelfuse, Inc. Sub. of Tracor, Inc.	Low Key Corporation Strong Group	Magnecomp, Inc.	Manhattan Electric Cable Corporation
Litton Electron Devices	LSI Jennings	Magnecraft Electric Co.	Mantex Corp.
Litton Encoder Div.	LSI Logic Corp.	Magnelab	Manu-Tronics, Inc.
Litton POly-Scientific, Div. of Litton Industries	LTI, Inc.	Magnetek Triad	Marconi Instruments
Litton Potentiometer Div.	Lucas Duralith Corporation	Magnetic Instrumentation	Markat Div. Wild Oats Corp.
Lixi, Inc.	Lucas Ledex Inc.	Magnetico Inc.	Markel Corp.
LNP Engineering Plastics Div. of ICI Americas	Lucas Ledex Inc.	Magnetic Shield Corporation Perfection Mica Co.	Markel Corp.
LNR Communications, Inc.	Lumex Opto/Comps., Inc.	Magnetic Technology	Markem Corp.
LocTite Luminescent Sys., Inc. LocTite Corp.	Lyn-Tron, Inc.	Magnos	Markenrich Corp.
Locus	LZR Electronics, Inc.	Magnum Opus Custom Elctrn. Engrg.	Marktech International Corp.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
MarLee Switch Co.	Maxtor Corporation	MDF Products Inc.	Mepcopal Company
Marlow Industries, Inc.	Maxwell Electronics	Measurement Systems, Inc.	Mercer Electronics Simpson Electric Co.
Marquardt Switches Inc.	McCoy Electronics Co. A Sub. of Oak Industries	MEC A/S	MERET, Inc.
Marway Prods. Inc.	McCurdy Radio Industries Limited	Mechanical Enterprises	Merix Chemical Co.
Master Electronic Controls	MCE Semiconductor, Inc.	Mechanical Products Inc.	Methode Electronics, Inc.
Materials Research Corporation	MCG Elctrns.	Meissner Industries	Metra Byte Corp.
Math Assocs.	McGill Manufacturing Co., Inc.	Melcher, Inc. Melcher A.G.	Metrosonics, Inc.
Math Assocs.	MCI Transformer Corporation	Melcor/Materials Elctrn. Prods.	Metuchen Capacitors, Inc.
Mathematical Systems Design, Inc.	McKenzie Technology	Melles Griot, Inc.	MF Elctrns. Corp.
Matrix Corp.	MCL, Inc.	Memcor-Truohm, Inc.	MFM Technology, Inc. Affiliate of Unitrode Corp.
Matrix Systems Corp.	McLean Engineering Zero Corporation	Memcor-Truohm, Inc.	MG Electronics
Matrox Electronic Systems, Ltd.	McLean Midwest Sub. of Zero Corporation	Memodyne	Microavionics Corp.
Matsuo Electronics	McLean Midwest Sub. of Zero Corporation	Memory X	Microcap, Inc. A MicroSemi Company
Maurey Instrument Corp.	3M-Electronic Products Division	Memtron Technologies, Inc.	Micro-Circuits Co., Inc.
Maxon Precision Motors, Inc.	3 M Photodyne Inc.	Mepco/Centralab Corp. Hdqrtr. North American Philips Corporation	MICRO CRYSTAL DIVISION / SMH Micro Crystal Division SMH

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Micro Devices Product Group Therm-O-Disc, Inc.	Micro/sys	Minelco Inc. - A Talley Ind.	Molytek, Inc.
Micro Devices Product Group Therm-O-Disc, Inc.	Micro Technical Industries	Mini-Circuits Lab.	Monitor Products Co., Inc.
MicroDimensions, Inc.	Microtran Co. Inc.	Mini Computer Technology	Monolithic Sys.
Microdot, Interconnect Systems Division	Microwave Applications Group	Mini-Systems, Inc. Thick/Thin Film Division	Moody Tools, Inc.
Micro Industries	Microwave Filter Inc.	Mini-Systems, Inc. Electronic Package Div.	Mors Technologies Inc. Mors Group-France
Micro Mo Electronics, Inc.	Mid-Eastern Industries	MISCO/Minneapolis Speaker Co., Inc.	Motion Control Devices An EG & G Torque Systems Co.
Micronel U.S.	Midtex Relays, Inc.	MITEQ Inc.	Motorola Semiconductor Prods. Sector
Micronics Technology Inc.	Midwest Components, Inc.	Mitsubishi Electronics	Motor Technology, Inc.
Micro-Ohm Corp.	Millivac Instruments, Inc.	MKS Instruments, Inc.	Motor-Tronics, Inc.
Microplex, Inc.	Mill-Max Manufacturing Corp.	MODULAIR	M P C
Micro Pneumatic Logic, inc.	Mill-Max Manufacturing Corp.	Modular Devices	MPC Div. of Consulting Systems
Microsemi Corp.	Milross Controls, Inc.	Moisture Register Products Div. Aqua Measure Instrument Co.	MTE Corp.
Microsemi Corp. Colorado Microsemi Corp.	Mills Resistor Co.	Molecu-Wire	M-Tron Industries
Microsonics Inc.	Milwaukee Resistor Corp.	MOLEX, Inc.	Mueller Elec. Co.
Micro Switch A Honeywell Div.	Minc Incorporated	Moli Energy Limited	Multi-Amp Corp. TBG

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
MultiPower, Inc. A MultiComp Company MultiPower, Inc. MultiComp., Inc.	National-Standard National-Standard Co.	NW New Wave Instruments	North Hills Electronics, Inc. North Hills Electronics
MP Multi Products International	ntt NATIONAL TELTRONICS National Tel-Tronics	NEY The J. M. Ney Company	DISPLEX, INC. A SUBSIDIARY OF NORTH HILLS ELECTRONICS INC. North Hills Electronics Inc. Power Products Div.
MULTIWIRE DIVISION KOLLMORGEN CORPORATION Multiwire Division Kollmorgen Corp.	N National Wire & Cable Corp.	NH RESEARCH NH Research, Incorporated Instrumentation Products Division	NORTON ASSOCIATES, INC. 10 DI TOMAS COURT, COPIAGUE, N. Y. 11726 Norton Associates, Inc.
MUPAC Mupac Corp. Carlo Gavazzi Co.	NCE NCE:National Custom Enterprises, Inc.	nc NIC Components Corp.	Nova Nova Electric Inc.
muRata ERIE Murata Erie North America, Inc.	NCR NCR Comten NCR Comten, Inc. NCR Corp.	nic Nichicon (America) Corp.	TAURUS by Nov Nova Electric Inc.
MuSHIELD COMPANY DIVISION OF BOMCO, INC. MuShield Products Div. Bomco Inc.	NCR NCR Microelectronics NCR Corporation	NTE Nicolet Instrument Corp. Test Instrument Division	novotechnik u.s., inc. Novotechnik U.S., Inc.
MWS Wire Industries MWS Wire Industries	NDK AMERICA INC. NDK America, Inc.	NJE POWER SUPPLIES NJE Corporation	NRD INC. NRD Inc. Subsidiary of Mark IV Inds., Inc.
H. Wm. Myers & Assocs.	NEC NEC Electronics, Inc.	NKK switches OF AMERICA INC. NKK Switches of America, Inc.	NTE NTE Electronics, Inc.
NAMCO CONTROLS AN ACME-CLEVELAND COMPANY Namco Controls An Acme-Cleveland Co.	NEI Ferranti-Packard NEI Ferranti-Packard Electronics	NMB NMB TECHNOLOGIES INCORPORATED NMB Technologies	NTK NTK Technical Ceramics NGK Spark Plugs (USA), Inc.
npi® Nano Pulse Industries	NEL FREQUENCY CONTROLS, INC. NEL Frequency Controls, Inc.	nohau ELEKTRONIK AB Nohau Corporation	NCS Nu-Concept Systems
NATEL Natel Engineering Co., Inc.	NES Slimline A Systems-Oriented Panel Meter NES, Inc. (Nationwide Electronic Systems)	Non-Linear Systems – Division of Kaypro Non-Linear Systems/Div. of Kaypro Corp.	NU DATA Nu Data, Inc.
NATIONAL ELECTRONICS National Electronics Corp.	NETCOM NETCOM, Inc	north atlantic a computer products company North Atlantic Industries	NUMERIX Numerix Corp.
ncc National Controls Corp.	NEURON Neuron Electronics, Inc.	north atlantic North Atlantic Industries	NWL TRANSFORMERS NWL Transformers
NIS National Information Systems, Inc. National Information Systems, Inc.	Newman, M. M., Corp. Heli-Tube Div.	Northeast Innovations Northeast Innovations, Inc.	Nytronics Components Group Nytronics Components Grp., Inc.
NATIONAL INSTRUMENTS® The Software is the Instrument™ National Instruments	NEWPORT Newport Electronics	mac Northern Ampower Corporation	OAK Switch Systems Inc. Oak Switch Systems

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Oaktron Manufacturing, Inc.	Opamp Labs, Inc.	Oriental Motor U.S.A. Corporation	Pacific Scientific Co.
Ocean State Thermotics, Inc.	Optek Technology Inc.	Ortel Corp.	PacTec LaFrance Corp.
Octagon Systems	Optek Technology Inc.	Oscillatek K & L Microwave	PacTec LaFrance Corp.
Ocular Inc.	Optelecom, Inc.	Oshino Electric Lamp Works, Ltd.	Paine Corporation
Odell, M. P., Co.	Optical & Conductive Coatings Meridian Inds., Inc.	Oslo Controls	Paladin Corp.
Oeco Corp.	Optima Enclosures	Otto Controls Otto Engineering	Panametrics
Ohio Semitronics, Inc.	Optima Enclosures	Ovenaire-Audio-Carpenter Oak Industries	Panametrics
Ohmite Manufacturing Co.	OPT Industries Inc.	Ovenaire-Audio-Carpenter Oak Industries	Panasonic Industrial Co. Battery Sls. Div.
Ohmtek Inc. Sfernice Group Company	Opto Diode Corp.	Oxley, Inc.	Panasonic Industrial Company Electronic Components Division
Olektron Corp. Signal Technology Corp.	Optoelectronics/Textron	Pace Inc.	Panduit Corp.
Omega Engineering	Opto 22	Pacer Industries, Inc.	Panel Components Corp.
Omnibyte Corp.	Optrex/Satori	Pacific Instruments Inc.	Papst Mechatronic Corp.
Omniprint, Inc.	Oram High Voltage	Pacific Microcomputers Signal Technology	Para-Line Transformer Co., Inc.
OMNI Switch USA, Inc.	Orbit Instrument of Cal.	Pacific Power Source Corp.	Park Electronics
Omron Electronics, Inc. Consumer & Commerical Div.	OrCAD Systems Corp.	Pacific Resistor Co.	Parker Seal Grp.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
PAR-METAL Par Metal Products, Inc.	 Piconics	 PMI Motion Technologies	 Power Conversion Products
 PCA Electronics	PIEZO Piezo Electric Products, Inc.	POINT 4 DATA CORPORATION Point 4 Data Corp.	POWER DESIGNS Power Designs, Inc.
PCB PIEZOTRONICS PCB Piezotronics	 Piezo Technology Inc.	POLARA Polara Engineering Inc.	THERMSTRATE® Power Devices Inc.
PC TRANSFORMER CORP. PC Transformer Corp.	PIHER Piher International Corp.	POLYCASE® PRODUCTS DIVISION E•C•P CORPORATION POLYCASE PRODS. ECP Corp.	Power Dynamics, Inc. Power Dynamics Inc.
PEARSON ELECTRONICS, INC. Pearson Electronics, Inc.	 Pillar Industries, Inc.	POLYPHASE A KAPPA NETWORKS COMPANY Polyphase Instrument	POWEREX Powerex Westinghouse, GE, Mitsubishi
PENN-TRAN Penn-Tran Corp.	Pioneer Magnetics Pioneer Magnetics	PolyPhaser Corporation PolyPhaser Corporation	POWER GENERAL A SUBSIDIARY OF UNITRODE CORPORATION Power General Unitrode Corp.
PENSTOCK Penstock Engineering Labs. Penstock, Inc.	 PITTMAN Penn Engrg. & Mfg. Corp.	POLYTRON DEVICES, INC Polytron Devices, Inc.	POWERLINE 10 Cochituate Street Natick, MA 01760 (617) 655-7987 Powerline,Inc. Chloride Power Elctrns.
PC PERCON® PERCON (Peripheral Connections, Inc.)	elcom PITTMAN Penn Engrg. & Mfg. Corp.	POMONA Pomona Electronics	POWER MAGNE-TECH CORP. Power Magne-Tech Corporation
PERMA POWER® Electronics INC. Perma Power Elctrns.	 Plainview Batteries, Inc.	 Pomona Electronics	POWER-ONE D.C. POWER SUPPLIES Power-One D.C. Power Supplies
sockets PLUS Perma Power Elctrns.	 Plastic Capacitors, Inc.	Portescap Portescap U.S., Inc.	PPI POWER PAC INC. Power Pac
PhilipsECG A North American Philips Company Philips ECG American Philips Co.	PLASTICORP Plasticorp	 Positronic Industries, Inc.	 Power-Pak, Inc.
PhiTech. Phi Technologies, Inc.	PLATO PRODUCTS, INC. Plato Products, Inc.	P&B Potter & Brumfield A Siemens Co.	POWERSONIC RECHARGEABLE BATTERIES Power-Sonic
PHOENIX CONTACT Phoenix Contact	PLESSEY Plessey Electronic Systems Corp.	powerbox inc. Powerbox Inc.	Power Star, Inc. Power Star, Inc.
PHOENIX WIRE, INC. Phoenix Wire, Inc.	ple Pletronics, Inc.	PowerCard CORPORATION Power Card Corp.	 Power Star, Inc.
PICO Electronics, Inc. Pico Electronics, Inc.	Pletronics Pletronics, Inc.	ETERNACELL Power Conversion, Inc. Hawker Siddeley Group, Ltd.-London, England	POWER SWITCH Corp. Power Switch Corporation

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Power Systems, Inc.	Precision Filters	PrimeLine Soltec Corporation	Pylon Elex Development Co. Ltd.
Powertec Power Supplies,Inc. Div.of Astec America	Precision Interconnect	Prime Power A Prime Technology Co.	QSI Corporation
Powertec Power Supplies,Inc. Div.of Astec America	Precision Metal Products Co.	Prime Technology, Inc. See General Resistance, A Prime Technology Co.	Q-Tech Corp.
Power Technology Components A Div. of Microsemi Corp.	Precision Power Systems	Princo Instruments, Inc.	Qualidyne Systems Unitech Ltd.
Power Technology, Inc.	Precision Resistive Products, Inc.	Printer Products	Qualitec Technologies, Inc.
Power Ten, Inc.	Precision Resistor Co., Inc.	Probe Master, Inc.	Quality Thermistor
POWERTRON See Industrial Test Equipment Co., Inc.	Precision Specialties, Inc.	Production Automation, Inc.	Quam-Nichols Co.
POWR-UPS Corp.	Precision Standard Time, Inc.	Product Technology, Inc.	Quantum Data, Inc.
PPD, Inc.	Precision Tech. Sewing	Programmed Test Sources	Qwint Data, Inc.
PPM, Inc.	Preh Electronic Industries, Inc.	Prototek, Inc.	Radio Materials Corp.
Precicontact, Inc.	Prema Precision Electronics, Inc.	Pulizzi Engineering, Inc.	Radix Wire Co.
Precision Components, Inc.	Premier Metal Prods. Co.	PULNiX America, Inc.	Radstone Technology
Precision Control Manufacturing, Inc.	Prem Magnetics, Inc.	Pulse Tronic Inc.	Ragen Corp. Systems Div.
Precision Electronics	Pres-Air-Trol Corp.	Pure Data Ltd.	Ram Chemicals, Div. Whittaker Corp.
Precision Fabrication Technologies, Inc.	Pressure Controls, Inc.	Pyle Industries, Inc.	Rank Brimar Inc.

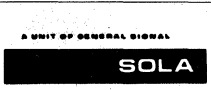
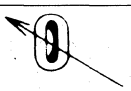
LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Rantec Division Emerson Electric Co.	Regdon Solenoid, Inc.	Risk, George, Inds.	Ross Engineering Corp.
Raychem Corp. Elctrns. Grp.	Regent Controls, Inc.	Rittal Corp.	Rowe Industries, Inc.
RAYOVAC Corporation	RE Instruments Corp.	Ritz Electronics/Relco	RTE Power/Mate
Ray Proof Shielding Systems Corp.	Relay Specialties	RMF Products, Inc.	RTS Systems, Inc.
Raytheon/TAG Semiconductors Ltd.	Reliability, Inc.	RO Associates, Inc.	Rundel Prods. Allied Control
RCD Components, Inc.	Remtek Corporation	Robbins & Myers/Electro-Craft	Ryan International Corp.
R. C. Electronics Inc.	Renco Electronics, Inc.	Robinson Nugent, Inc.	S A B NIFE, Inc. Div. of Sonesson
RCL-Shallcross	Reproduction Technologies Inc.	Robinson Nugent, Inc.	SAFT America Inc.
RDI Elctrns., Inc.	Republic Electronics Co.	Robison Electronics	Sage Laboratories, Inc.
Reactel, Inc.	Resistors, Inc.	Rochester Instrument Systems	SAIA Inc.
Real Time Devices, Inc.	Resonant Power Technology	ROD-L Electronics, Inc.	Samarius Precision Instruments, Inc.
Rebco International	RFI Corporation	Roean Industries, Inc.	Sam Sung Elctrn. Dvcs. America, Inc.
Red Square Company	RF Monolithics, Inc.	Rogan	Samtec, Inc.
Reeves-Hoffman Div. Dynamics Corporation of America	Rhombus Industries	Rogers Corporation Flexible Interconnections Div.	S & H Inds.
Regdon Solenoid, Inc.	Ridge Tool Co. Sub. Emerson Elec. Co.	Rose Enclosures Sys., Inc.	Sangamo Components Division

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Sanyo Energy Corp.	Schuster Electronics	Semiconductor Packaging Materials Co.	Shindengen America Inc.
SARONIX	Science & Engrg. Consultants, Inc.	Semikron, Inc.	Shin-Etsu Polymer America, Inc.
SARONIX	Science/Electronics	Sensitive Research Instruments	Shogyo International Corp.
Savoy Electronics, Inc.	Scientific Columbus, Inc. Esterline Corporation	Sensor Scientific, Inc.	Shokai Far East, Ltd.
Sawtek Inc.	Scientific Technologies Optical Sensor Div. Inc.	Sensym, Inc.	Shure Brothers Inc.
Scanbe Unit of Zero Corporation	Scientific Technologies Optical Sensor Div. Inc.	Serco Products Division:Serco Mold, Inc.	Shurite Meters A Prime Technology Co.
Schaevitz Engineering	Seacor, Inc.	Serial Lab Prods., Inc.	Sidereal Corp. TransTechnology Corporation
Schaffner EMC, Inc. Instr. Div.	Seattle Aircraft Bearings	Servo-Tek Products Co.	Siemens Components, Inc. Special Products Div.
Schenck Pegasus Corp.	Security Plastics, Inc.	Setra Systems, Inc.	Sierracin/Magnedyne
Schlumberger Instruments Schlumberger Technologies	SEEQ Technology	SGS-THOMSON Microelectronics	Sierra Monitor Corp.
Schott Electronics	Seiko Instruments U.S.A., Inc. Components Div.	Shallco, Inc.	Sigmapower, Inc.
Schott Glass Technologies, Inc.	Seiko Instruments U.S.A., Inc. Components Div.	Shalltronix Corp.	Sigma Systems Corp.
Schrack North America Corp.	Selco Products Co. SEL Sales, Inc.	Sheldahl, Inc.	Signal Research Inc.
Schroff Incorporated Schroff GMBH	Sel-Rex Div. OMI Intl. Corp.	Shelly Associates, Inc.	Signal Research Inc.
Schurter, Inc.	Semiconductor Circiuts, Inc. Emerson Electric, Co.	Shinano Kenshi Corp. (SKC)	Signal Transformer Co., Inc. Insilco Corporation

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Silicon Detector Corp.	Sonicall, Inc.	Spectrum Control, Inc.	Stacoswitch
Silicon General	Sonnenschein Batteries Inc.	Spectrum Signal Processing Inc.	Staco Transpower
Silicon Power Cube Corp.	Sorenson Lighted Controls	Spectrum Technology, Inc. DATUM, Incorporated	Stancor Products Hamilton Standard Controls
Silonex Inc.	Soshin Electric Co., Ltd.	Spellman High Voltage Elctrns. Corp.	Standard Crystal Corporation
Simpson Electric Co.	Souriau, Inc.	Spellman High Voltage Elctrns. Corp.	Standard Grigsby, Inc. Flint Industries
Sinclair Radio Laboratories Ltd.	Southco, Inc.	Sperry, A. W. Instruments	Standard Insert Co. Penn Engrg. & Mfg. Corp.
Sjoberg, C., & Son, Inc.	Southern Computer Corp.	Spiricon, Inc.	Standex Electronics Standex International
Skan-A-Matic Electro Corporation	Southern Computer Corp.	Sprague Electric Company Distbn.Div.	Stanford Applied Engrg. Inc.
Skydyne Div. of AAR, Brooks & Perkins	Southtronics, Inc.	Sprague Electric Company The Semiconductor Group	Stanford Applied Engrg. Inc.
Slaughter Co.	Specialty Cable Corporation	Sprague-Goodman Elctrns., Inc.	Stanford Resch. Sys., Inc.
Sloan Co.	Speciality Electronics, Inc.	Square D Co.	Stanford Telecommunications, Inc.
SMK Electronics Corporation, U.S.A.	Speco Div. Components Specialties, Inc.	SR Engineering BW/IP International, Inc.	Stantron Unit of Zero Corporation
 Sola A Unit of General Sign.	Spectrol Electronics	SSAC Incorporated	Star Micronics, Inc. OEM Division
Solid State Systems	 Spectron Glass & Electronics, Inc.	Stackbin Corp.	Statek Corp.
Solitron Devices, Inc. Semiconductor Group	Spectronics Corp.	Staco Energy Products Co.	State of the Art, Inc.

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Staver Co., Inc.	Superior Electric	Syracuse Electronics Pass & Seymour, Inc.	TECA, ThermoElectric Cooling America Corp.
Stetron International, Inc.	Supertek Electronics, Inc.	Tachonics Corporation Grumman Corp.	Teccor Electronics, Inc.
STI Control Components Div.	Super Vexta	Tadiran Elec. Inds. Inc.	Tech-Etch, Inc.
Stock Drive Products Div. of Designatronics, Inc.	Switchcraft, Inc. A Raytheon Company	Tafa, Inc.	Tech Laboratories Inc.
STRONGBOX	Switches Unlimited, Inc.	Taliq Corp.	Techmar Corp.
Struthers-Dunn Military Relays Sub. Of Nytronics, Inc.	Switching Systems International	Tamura Corporation of America	Technipower, A Penril Co.
Struthers-Dun ial & Commerical Relays Sub. of Nytronics, Inc.	Sylvania GTE Control Devices	Tamura Corporation of America	Technitrol
Suckle Corp.	Sylvania Miniature Lighting GTE Corporation	Tansitor Electronics	Technitrol
Sullins Electronics Corp.	SYMBICON	Tauber Elctrns. Inc.	Techno A DSG Company
Summit Electronics Basler Electric	SYMBICON	Taylor Electronics, Inc.	Technology Dynamics Inc.
Sundstrand Data Control Inc. Sundstrand Corporation	Sym-Tek Sys., Inc.	T-Bar Incorporated a Data Switch Co.	Techron Div. Crown Intl, Inc.
Sun Electronic Systems, Inc.	Symtron Corp. Div. Diceon Elctrns.	TDJ Co., Inc.	Techtrol Cyclonetics, Inc.
Sun Electronic Systems, Inc.	Synektron Corporation	TDK Corporation Electronic Components & Material	Tecknit (Eastern Facility)
Sunrise Electronics, Inc.	Syntest Corp.	TDS Tang Ind.	Tectrol, Inc.
Sunshine Scientific Instruments	Syntest Corp.	Team Systems Div. of Toyo Spectrum	Teka Interconnection Systems

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Tektronix, Inc.	TELTEC, INC.	Thermalloy, Inc.	TL Inds. Inc.
Tekworks, Inc.	Temescal/Edwards High Vacuum Intl. The BOC Group, Inc.	Therm-O-Disc, Inc. Sub. Emerson Elec. Co.	Tocos America, Inc. Tokyo Cosmos Electric Co., Ltd.
Telebyte Technology, Inc.	Tempil Div. Big Three Inds.	Therm-O-Disc, Inc. Sub. Emerson Elec. Co.	Todd Products Corp.
Telectro Systems Corp.	Temptronic Corporation	Thermo Electric	Todd Systems, Inc.
Teledyne Inet Teledyne, Inc.	Tenney Engineering	Thermometrics, Inc.	Toko America, Inc.
Teledyne Microelectronics	Ten-Tec, Inc.	Third Domain, Inc.	Toko America, Inc.
Teledyne Relays Teledyne, Inc.	Tepro of Florida	Thomas & Betts Corporation	Topaz, Inc.
Teledyne Ryan Electronics	Test Probes, Inc.	Thomas & Betts Corporation	Topaz, Inc.
Teledyne Solid State A Div. of Teledyne Relays	Tetra-Etch W. L. Gore & Associates, Inc.	Thordarson Meissner Components Corp. of Amer.	Topflight
Teledyne Thermatics Teledyne Inds., Inc.	Tetragenics	Thordarson Meissner Components Corp. of Amer.	Torad Coil Co., Inc.
Telegenix, Inc. Div. of Inductotherm Industries	Tettex Instruments, Inc.	Thorn EMI Electron Tubes Inc.	Torema U.S.A., Inc.
Telepacific Electronics Co., Inc.	Tettex Instruments, Inc.	Three-Five Sys., Inc.	Toroid Corp. of Maryland
Telephonics Corporation/PRD Instruments	Texas Instruments Connector System	TII Industries Inc.	Torotel Prods. Inc.
Telonic/Berkeley Berkeley Inds. Inc.	Texas Optoelectronics, Inc.	Timber-Top	Torotron Corp.
Telpar, Inc.	Texmate, Inc.	Timeplex, Inc.	Torwico Elctrns. Inc.

LOGOFINDER DIRECTORY

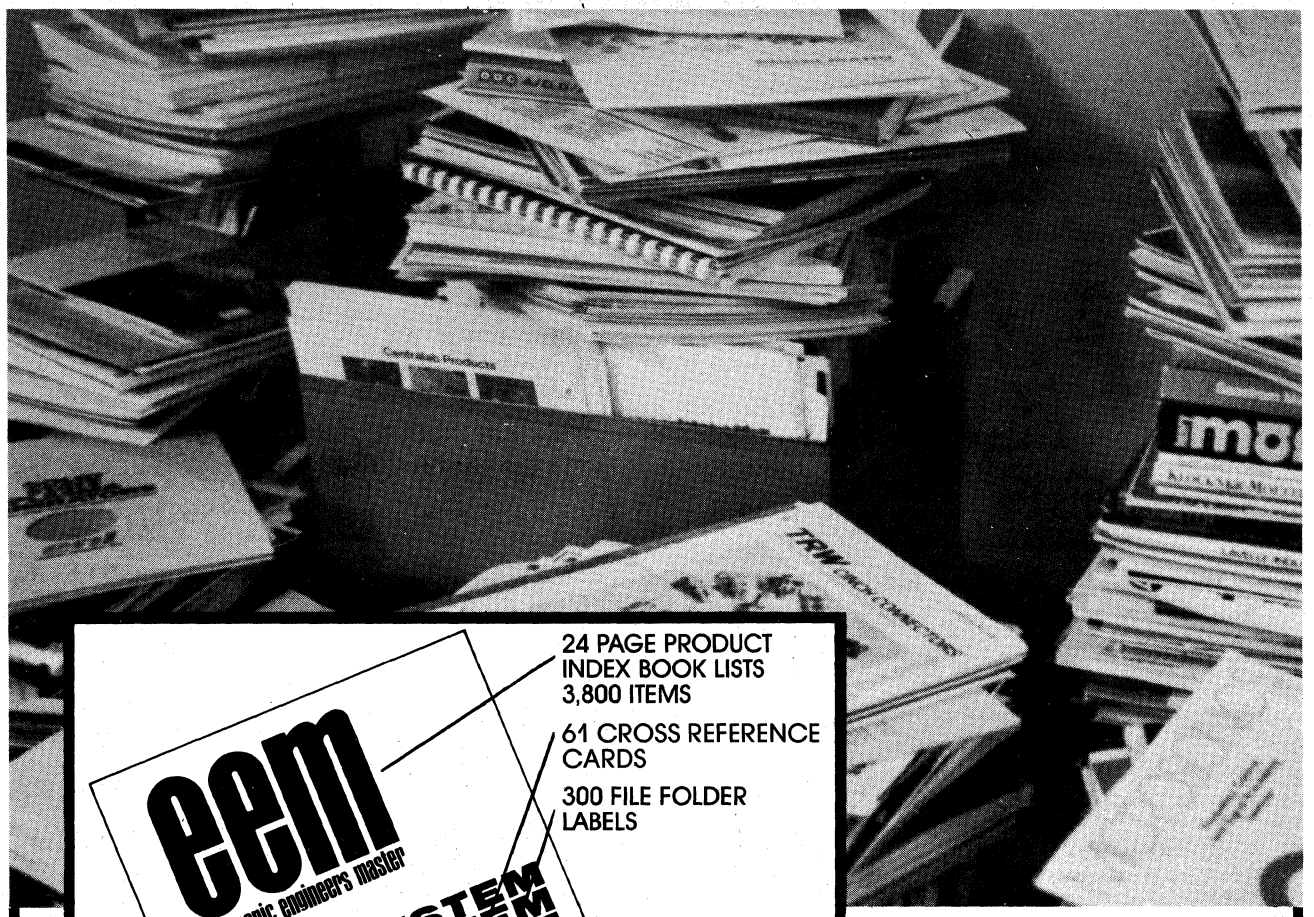
Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Tower Electronics, Inc.	Trans Metrics, Inc.	Ultimate Technlg.	Unitron Inc.
TOYOCOM USA INC.	Tri-Mag, Inc.	Ultronix, Inc.:Vishay	Universal Voltronics
Toyo Spectrum Corp.	Trio Laboratories, Inc.	Ulveco, Inc.	UPSystems, Inc. Subsidiary of Chloride Power Elec.
Tracewell Enclosures, Inc.	Trio Laboratories, Inc.	Unadilla Antenna Mfg. Co.	U.S. Components, Inc. Unitech PLC.
TRAK Microwave Corp.	Trio-Tech International	Ungar Div. Eldon Inds., Inc.	U. S. Digital Corp.
TRAK Systems Div. TRAK Microwave Corp.	Triplett Corporation	Unibox Div. of Amerex	USD Products Cooper Industries
Trans American Transformer	TRM, Inc.	Unicorp	USD Products Cooper Industries
Transco Products, Inc.	Trompter Electronics, Inc. Sterling Holding	Unipower Corporation	U.S. Terminals
Transco Products, Inc.	TRW Technar, Inc. TRW, Inc.	Unit Design	U.S. Toyo Fan Corp.
Transducers & Systems A Prime Technology Company	TS Products, Inc.	United Chemi-Con Inc.	UTE Microwave
Transducer Systems, Inc.	TTE, Incorporated	United Electric Controls	UTI Instruments Co.
Transformer Technologies, Inc.	Tusonix, Inc.	United States Crystal Corp.	UVP, Inc.
Transistor Devices, Inc.	Tyton Corp.	United Transformer Co.:Div. of Opt Industries Inc.	Vaco Products
Transmagnetics	Tyton Corp.	Unitrack Industries, Inc.	Valhalla Scientific
Transmagnetics	Ultimate Technlg.	Unitrode Corp.	Validyne Engineering Corporation

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Valor Electronics	Vermont Precision Resistor Codeco Corp. of Vermont	Vishay Resistive Systems Group	Voltarc Tubes
Valpey-Fisher:Matec Corp	Vernitech:Vernitron Corp.	Vishay Resistive Systems Group	Voltech, Inc.
Vanguard Electronics Co.	Vernitron Controls Vernitron Corporation	Vistar Corp.	Voltex
Vann Instruments, Inc.	Vernitron Corp. VRN Div.	Visual Communications Co., Inc.	Voltronics Corporation
Varian Microwave Equip. Div. Varian Assocs., Inc.	Vernitron Piezoelectric Div.	Visual Communications Co., Inc.	Vonco, Inc.
Varta Batteries, Inc.	Vibra-Metrics, Inc.	Visual Communications Co., Inc.	VTM Microwaves, Inc.
Vector Electronic Co., Inc.	Vibration Instruments Co.	Visual Information Institute	Wabash Magnetics
Vector Electronic Co., Inc.	Vibro-Meter Corp.	Vitec Electronic Corporation	Wabash Magnetics
Vectron Laboratories, Inc.	Vicon Industries, Inc.	VL Electronics, Inc. Varitronix LTD.	Walker Scientific
Veeder-Root	Victoreen, Inc.	VLSI Technology, Inc.	Wall-Able Mfg. Corp.
Veetronix, Inc.	Viking Connetors Co. Criton Technologies	VLSI Technology, Inc.	Wall Industries
Vega Precision Labs.	Viking Connetors Co. Criton Technologies	Volgen America, Inc.	Wall Industries
Vega Precision Labs.	Virginia Plastics Co.	Voltage Multipliers, Inc.	Wamco, Inc.
Velonex	VirTis Co.	Voltage Multipliers, Inc.	Warren-Knight Instrument Co. Warren Industries, Inc.
Vemaline Prods. Div.	Vishay-Mann System See Vishay Resistive Systems Group	Voltampere Corp.	Waters Manufacturing, Inc. Talley Industries

LOGOFINDER DIRECTORY

Logo/Mfr.	Logo/Mfr.	Logo/Mfr.	Logo/Mfr.
Wavetek San Diego, Inc.	Western Multiplex Corp.	Xedar Corp.	Carl Zeiss, Inc.
Wayne Transformers Co., Inc. A Marine Electric Systems Co.	Westinghouse Electric Corp. Control Division	Xentek, Inc.	Zendex Corp.
WECO Electrical Connectors, Inc.	West Instrument A Mark IV Company	Xerox Corporation	Zenith Components Group Zenith Electronics Corp.
Weed Instrument Co., Inc.	Weston Instruments Electrical Instrument Service, Inc.	Xerox Imaging Systems, Inc. Xerox Corp.	Zero Corp.
Weico Wire & Cable	Westrex Products	Xetel Corporation	Zeus Indl. Prods. Inc.
Weidmuller, Inc.	Wilco Corp.	Xico, Inc.	Zevatech, Inc.
Welch Allyn, Inc. Industrial Products Division	Wilcoxon Research	Xicor, Inc.	Ziatech
Wells Electronics	Wilmore Electronics Co.	Xsis Electronics, Inc.	Zierick Manufacturing Corp.
Wesco Electrical Co.	Wiltron	Xylog Corp.	Zippertubing Co.
WestCon	Wintek Corp.	Yellow Springs Instrument Co.	ZI-TECH Instrument Corp.
Westcor Corporation	The Wiremold Company	Yuasa Battery (America), Inc.	ZI-TECH Instrument Corp.
Western Elctrn. Comps. Corp.	World Products Inc.	Z Communications, Inc.	ZyMOS Corp.
Western Graphtec			



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MINIGLOSSARIES
FORMULAS • CHARTS
PRODUCT SELECTION GUIDES
FORMS
CODES TECHNICAL INFORMATION

WHERE TO FIND THEM IN THE 89/90 EDITION OF EEM

Abbreviations/Acronyms ..... **A**•1404, **B**•1090, **C**•1119 **D**•1156
AC Power Supplies, Product Selection Guide..... **D**•2156
ASCII Code ..... **D**•1080
Batteries, Product Selection Guide.... **D**•1447
Batteries & Fuel Cells, Characteristics..... **D**•1450
Cabinets, Enclosures, Racks & Chassis, Product Selection Guide..... **C**•1003
Capacitors, Basic Formulas..... **A**•1093
Capacitors, Miniglossary..... **A**•1066
Capacitors, Product Selection Guide . **A**•1002
Coils, Chokes, Inductors, Product Selection Guide..... **A**•1197
Conductors, Maximum Current Capacity of Copper & Aluminum... **A**•2272, **C**•1316
Connectors, Miniglossary..... **C**•1271
Connectors, Terminals & Sockets, Product Selection Guide..... **C**•1127
Crystals, Oscillators, Crystal & Piezoelectric Filters, Product Selection Guide..... **A**•1339
DC Power Supplies, Product Selection Guide..... **D**•1537
Delay Lines, Product Selection Guide..... **A**•1503
Dielectrics, Thermal Conductivity ..... **B**•1916
Discrete Semiconductors, Product Selection Guide..... **A**•2154
Displays, Readouts, & CRTs, Product Selection Guide..... **B**•1041
EBCDIC Code ..... **D**•1086
Encapsulation, Miniglossary..... **C**•1124
Fans, Blowers, Cooling Equipment, & Heat Exchangers, Product Selection Guide..... **C**•1631
Fiber Optics, Miniglossary ..... **B**•1185
Fiber Optics, Product Selection Guide..... B•1204
Filters, Power, Product Selection Guide..... **A**•1642
Filters, Signal, Product Selection Guide..... **A**•1683
IC Master ..... **A**•1740
Instruments, Test & Measuring, Product Selection Guide..... **D**•1210
Interconnection Systems, Product Selection Guide..... **C**•1702
Keyboards & Keypads, Product Selection Guide..... **B**•1854
Lamps, Lights, & Indicators, Product Selection Guide..... **B**•1126
Logofinder & Trademark Directories... **C**•901
Microwave Components, Product Selection Guide..... **A**•1776
Military Qualified Products List..... **B**•1002
Motors, Drives, & Rotating Components, Product Selection Guide..... **B**•1221
Opto Semiconductors, Miniglossary ..... **A**•2169
Oscilloscopes, Product Selection Guide..... **D**•1426
Panel Hardware, Product Selection Guide..... **C**•1583
Panel Meters, Analog & Digital, Product Selection Guide..... **D**•1376
Potentiometers, Trimmers, Controls, & Rheostats, Product Selection Guide..... **A**•2078
Power Supplies, Miniglossary ..... A•2276, **D**•1541
Power Supplies, AC, Product Selection Guide..... **D**•2156
Power Supplies, DC, Product Selection Guide..... **D**•1537
Protective Components (Fuses, Circuit Breakers, etc.), Product Selection Guide..... **B**•1351
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Resistor Color Codes..... **A**•1952
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SI Units, Basic Guide To, ... **A**•1434, **B**•1472, **C**•1692, **D**•1386
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Timers, Miniglossary..... **B**•1492, **D**•1140
Trademark & Logofinder Directories... **C**•901
Transducers & Encoders, Product Selection Guide..... **B**•1928
Transformers, Product Selection Guide..... **A**•2215
Voltage Drop Nomograph ..... **A**•2262, **C**•1469, **C**•1960 **D**•1718
Wire & Cable, Product Selection Guide..... **C**•1755
Wire Gauges—Diameter, Area, Copper Weight..... **C**•1343, **C**•1759

PACTEC®
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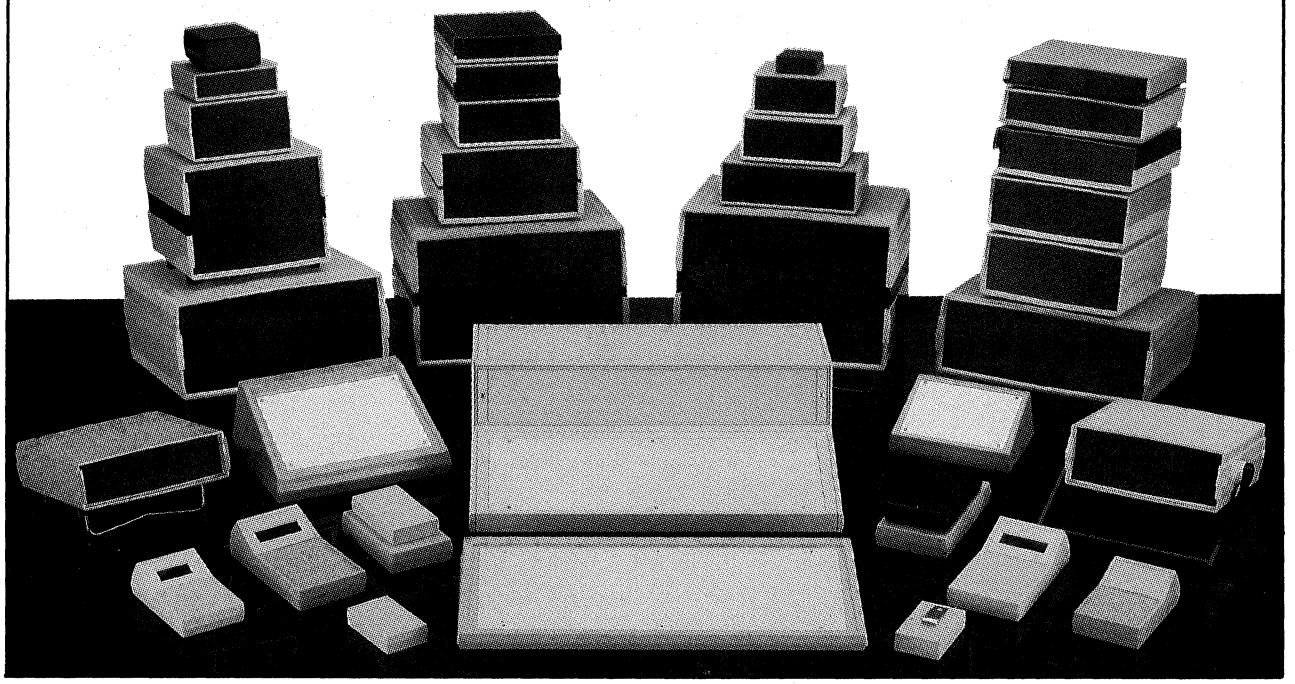
Electronic Enclosures

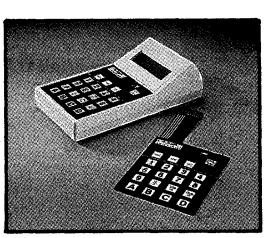
designed to work for you.



Standard Enclosures • Modified Standard Enclosures • Customization • Design Support

- **Standard Enclosures** - More than 118 models are currently in production. In stock at electronic distributors throughout the U.S.A. and worldwide. Standard Enclosures may be ordered as Prototype Kits (with all components necessary to assemble one enclosure) or as Production units (supplied without panels, card guides or mounting rails in certain models).
- **Machine Modified Standard Enclosures** - Modifications are made by CNC machining of standard models.
- **Custom Modified Enclosures** - In-mold modifications are made using unique, low cost tooling for specified "insert" areas of the enclosure. May be combined with CNC machining.
- **Custom Enclosures** - Contact factory for design support and quotations.
- **Prototype Kits** - Contain all components needed to assemble one unit. Certain C and CL Models are available in Kits which can be easily assembled into a choice of pre-selected heights; see pages 3 and 6.
- **Design Support** - With more than forty years experience in design and production of quality products the PacTec engineering staff can collaborate in every phase of your product design cycle; from pre-production prototype to totally custom original designs. Modifications can be made to top and bottom covers, front and rear panels and includes provisions for positioning PCB's and LCD's, controls and access points for Input/Output devices.
- **Other Available Literature** - Representative/ Distributor List, Price List, EMI/RFI Shielding & Material Properties, Engineering Drawings.

- **Custom and standard Membrane Switches** see page **C** • 1068
- **Custom Printed Overlays** see page **C**•1069



see pages **C** • 1066 thru **C** • 1074

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CABINETS

Manufacturer	Starting EEM Page No.	Consoles		Cabinets						Turrets		Racks		Special		Characteristics		
		Desk-top	Free-standing	Sys-tems	Bench	Desk-top	Instru-ment	Rack	Port-able	Bench	Desk-top	Equip-ment	Kits	Equip-ment Stands	Desks, Work Stations	Composition	19 in. Stan-dard	Shielded
AMCO Engineering Co.	C•1006	√				√	√				√	√				Aluminum	√	
Ango Electronics Corp.	C•1010							√									√	
Buckeye	C•1013				√		√										√	
Cabtron Systems Inc.	C•1014		√	√	√		√	√		√		√						
Compac Dev. Corp.	C•1016											√						
Crissman Mfg. Co.	C•1020		√	√			√	√				√					√	
D.L. Custom	C•1021	√	√				√	√										√
ECS Composites	C•1022	√	√	√	√	√	√	√	√			√						
EG&G Birtcher	C•1024						√					√						
Electra-Tec	C•1026	√	√		√		√								√			
Electronic Enclosure (WYLE)	C•1027	√	√	√	√	√	√	√		√	√	√		√	√	Metal	√	√
Electronic Solutions	C•1028			√	√	√		√	√			√						√
Electro-Space Fabricators Inc.	C•1031			√	√	√	√	√				√	√	√				√
Elma Electronics	C•1036	√	√	√	√	√	√	√	√			√	√				√	√
Emcor Products	C•1039	√	√	√		√	√	√		√	√	√			√	Steel	√	√
Equipto Electronics	C•1040	√	√	√	√	√	√	√		√	√	√			√		√	√
Everest Electronic Equipment	C•1053	√	√					√				√			√	Metal	√	√
General Devices	C•1056	√	√	√	√	√	√	√	√			√		√	√		√	√
Hammond Mfg. Co. Inc.	C•1057	√	√	√		√	√	√		√	√	√					√	√
Kalamazoo Technical Furniture	C•1058	√			√		√					√			√			
Lansing Instrument Corp.	C•1059					√	√	√				√				Aluminum, Steel, Plastic	√	√
Mupac Corp.	C•1060	√	√	√		√		√				√					√	
Optima Enclosures	C•1062	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√
PacTec	C•1066	√				√	√		√	√	√							
Par Metal Products Inc.	C•1076	√	√	√				√				√		√	√	Aluminium		√
Powerbox Inc.	C•1078				√	√	√											
Precision Fabrication Technologies Inc.	C•1079					√	√	√				√				Steel	√	
Premier Metal Prods. Inc.	C•1084	√	√	√		√	√	√	√			√			√		√	√
Rittal Corp.	C•1086		√					√									√	√
Ritz /Relco	C•1087	√	√	√	√	√	√	√	√	√	√					Steel,		
Rose Enclosures Sys. Inc.	C•1088	√		√	√	√	√		√									√
Schroff Inc.	C•1091			√			√					√	√				√	√
Skydyne	C•1095						√	√	√			√				ABS, FRP, Aluminum, Alum. comp.	√	√
Stantron	C•1098	√	√				√	√						√	√	var.		
TDJ Co. Inc.	C•1102											√	√					
Techmar Corp.	C•1105				√			√										
Tracewell Enclosures	C•1110	√	√	√	√	√	√	√	√		√	√						
Vector Electronics Co. Inc.	C•1120											√	√	√	√			
Zero Corp.	C•1122	√	√				√		√									

CASES

Manufacturer	Starting EEM Page No.	Type									Characteristics		
		Bench-top	Dis-play	Desk-top	Key-board	Kits	Instru-ment	Port-able	Tran-sit	Equip-ment, General	Composition	19 Inch Stand-ard	Shielded
Altech	C•1035			√			√	√	√	√	Polystyrene, Polycarbonate, Glass		
Ango Electronics Corp.	C•1010	√		√								√	
Bopla Enclosures Sys.	C•1012		√	√	√		√	√		√			
Buckeye	C•1013	√				√	√	√				√	
Calmark Corp.	C•1015		√					√					
Compac Dev. Corp.	C•1016						√			√			
ECS Composites	C•1022						√	√	√			√	√
Electro-Space Fabricators Inc.	C•1031			√				√	√		Aluminum, Plastic		√
Elma Electronics	C•1036	√	√	√	√	√	√	√				√	√
Everest Electronic Equipment	C•1053			√							Metal	√	
Gemini Inc.	C•1054	√	√			√	√	√	√	√			
General Devices	C•1056	√	√	√	√	√						√	√
Hammond Mfg. Co. Inc.	C•1057	√		√	√		√			√		√	√
Lansing Instrument Corp.	C•1059	√		√			√			√	Aluminum, Plastic	√	√
Optima Enclosures	C•1062	√	√	√	√	√	√	√		√		√	√
PacTec	C•1066	√	√	√	√	√	√	√		√	ABS, PC, Aluminum	√	√
Par Metal Products Inc.	C•1076	√	√	√			√	√		√			√
Polycase Products	C•1077	√	√	√			√			√	ABS, Nylon, Polypropylene		
Powerbox Inc.	C•1078	√		√		√	√				Extruded aluminum	√	
Precision Fabrication Technologies Inc.	C•1079	√	√	√	√	√	√						
Premier Metal Prods. Inc.	C•1084	√	√	√			√	√	√	√		√	√
Ritz /Relco	C•1087	√	√	√	√	√	√	√	√	√	Steel, Aluminum	√	
Rose Enclosures Sys. Inc.	C•1088	√	√	√	√		√	√		√			√
Schroff Inc.	C•1091	√		√			√	√		√		√	
Serco Products Div.	C•1092	√	√	√				√		√			√
Skydyne	C•1095	√	√	√	√	√	√	√	√	√	FRP (Fiberglass), ABS, Aluminum, Aluminum comp.	√	√
Stantron	C•1098	√				√					var.		
TDJ Co. Inc.	C•1102	√					√				Aluminum, Vinyl		
Techmar Corp.	C•1105	√				√							
Tracewell Enclosures	C•1110	√		√	√		√	√		√		√	√
Vector Electronics Co. Inc.	C•1120											√	
Zero Corp.	C•1122						√	√			Aluminum, Plastic	√	

PCB MOUNTING

Manufacturer	Starting EEM Page No.	Card Cages/ Frames	Card Files	Card Guides	Vertical Card Guides	Retainers	Inserters/ Extractors
Altech	C•1035			√		√	
Bivar Inc.	C•1011			√	√		√
Bopla Enclosures Sys.	C•1012	√	√	√	√	√	
Buckeye	C•1013	√		√			
Calmark Corp.	C•1015	√	√	√	√	√	√
EG&G Birtcher	C•1024	√		√		√	√
Electronic Solutions	C•1028	√	√	√	√		√
Electro-Space Fabricators Inc.	C•1031	√	√	√	√	√	√
Elma Electronics	C•1036	√	√	√	√	√	√
General Devices	C•1056	√	√				
Mupac Corp.	C•1060	√		√	√	√	√
Optima Enclosures	C•1062	√					
PacTec	C•1066		√	√			
Premier Metal Products Co.	C•1084	√					
Ritz/Relco	C•1087	√	√	√	√	√	√
Rose Enclosures Sys. Inc.	C•1088	√	√	√	√	√	
Scanbe	C•1089	√	√	√	√		√
Schroff Inc.	C•1091	√		√	√	√	√
Serco Products Div.	C•1092	√		√		√	
Techmar Corp.	C•1105	√					
Tracewell Enclosures	C•1110	√	√	√	√	√	√
Unitrack Industries	C•1114	√	√	√	√	√	√
Vector Electronics Co. Inc.	C•1120	√		√			

CHASSIS/TRACKS

Manufacturer	Starting EEM Page No.	Chassis	Tracks/ Slides
Altech	C•1035		√
Buckeye	C•1013	√	
Compac Development Corp.	C•1016	√	
EG&G Birtcher	C•1024	√	
Electronic Enclosures	C•1027	√	√
Electra-Tec	C•1026		√
Electro-Space Fabricators Inc.	C•1031	√	√
Elma Electronics	C•1036	√	√
Emcor Products	C•1039	√	√
Equipto Electronics Corp.	C•1040	√	√
General Devices	C•1056	√	√
Lansing Instrument Corp.	C•1059	√	
Mupac Corp.	C•1060	√	√
Optima Enclosures	C•1062	√	√
Polycase Products	C•1077	√	√
Powerbox Inc.	C•1078	√	
Precision Fabrication Technlgs. Inc.	C•1079	√	
Ritz /Relco	C•1087	√	√
Strongbox	C•1100	√	√
TDJ Co. Inc.	C•1102	√	√
Techmar Corp.	C•1105	√	√
Tracewell Enclosures	C•1110	√	√
Zero Corp.	C•1122	√	√

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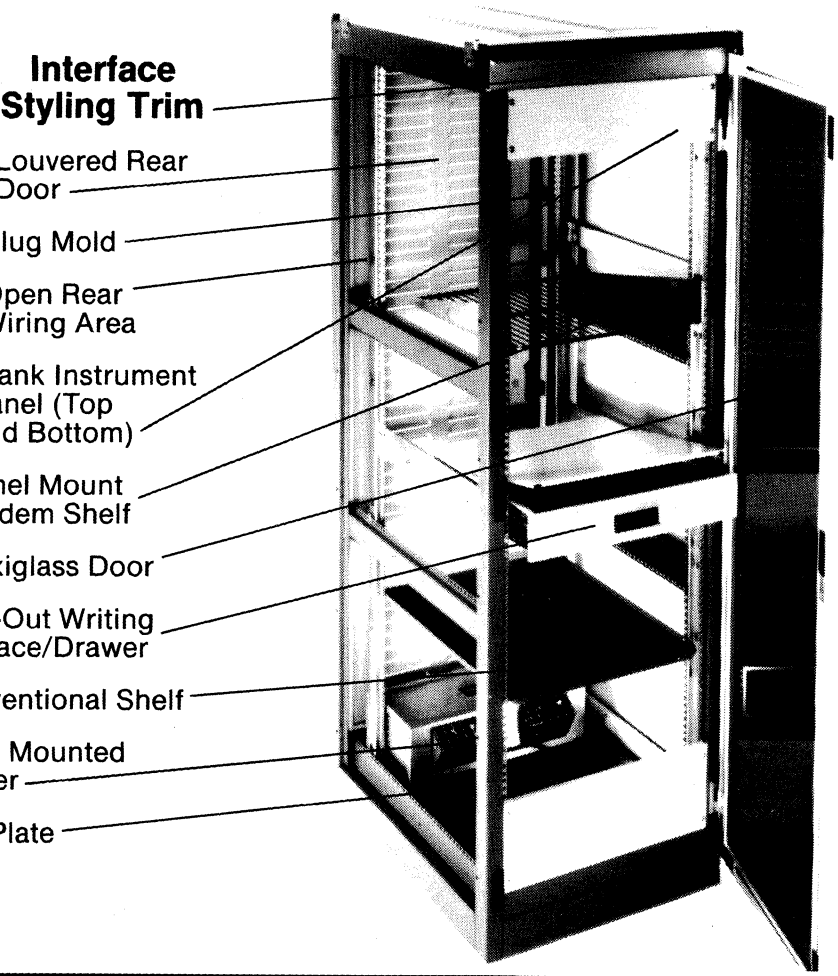
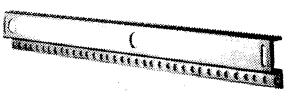
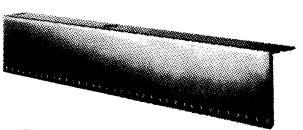


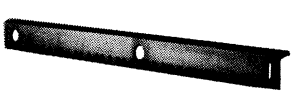
Dual Mounting Flange for Panel and Equipment or Slide Mounting



19" Panel Mounting in 24" Panel Width Frame



Front Panel Mounting Flange Only



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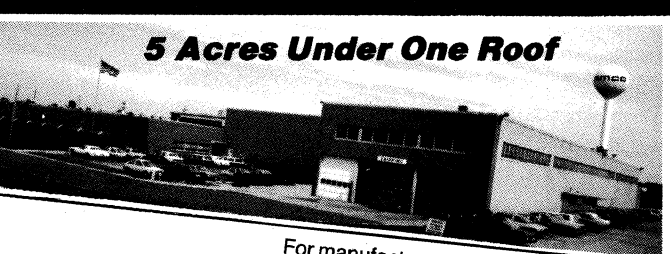

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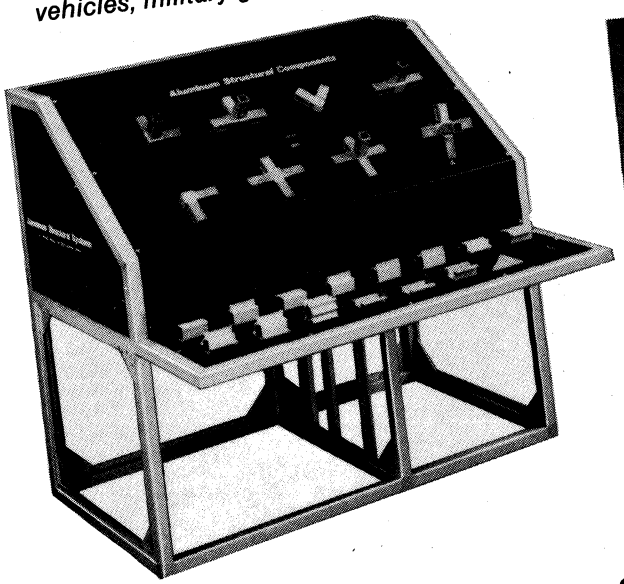

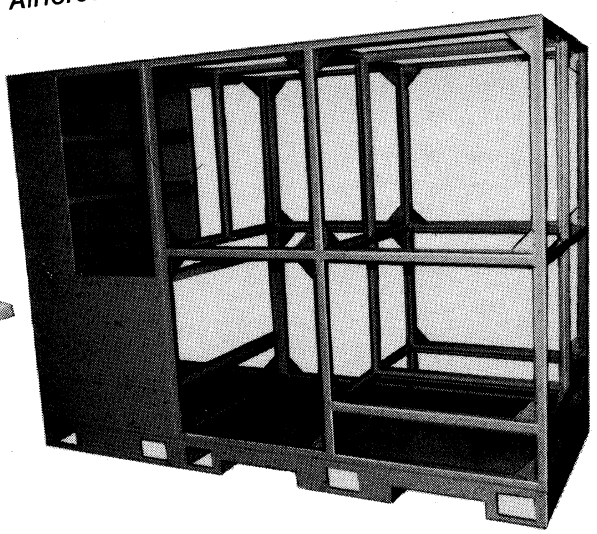

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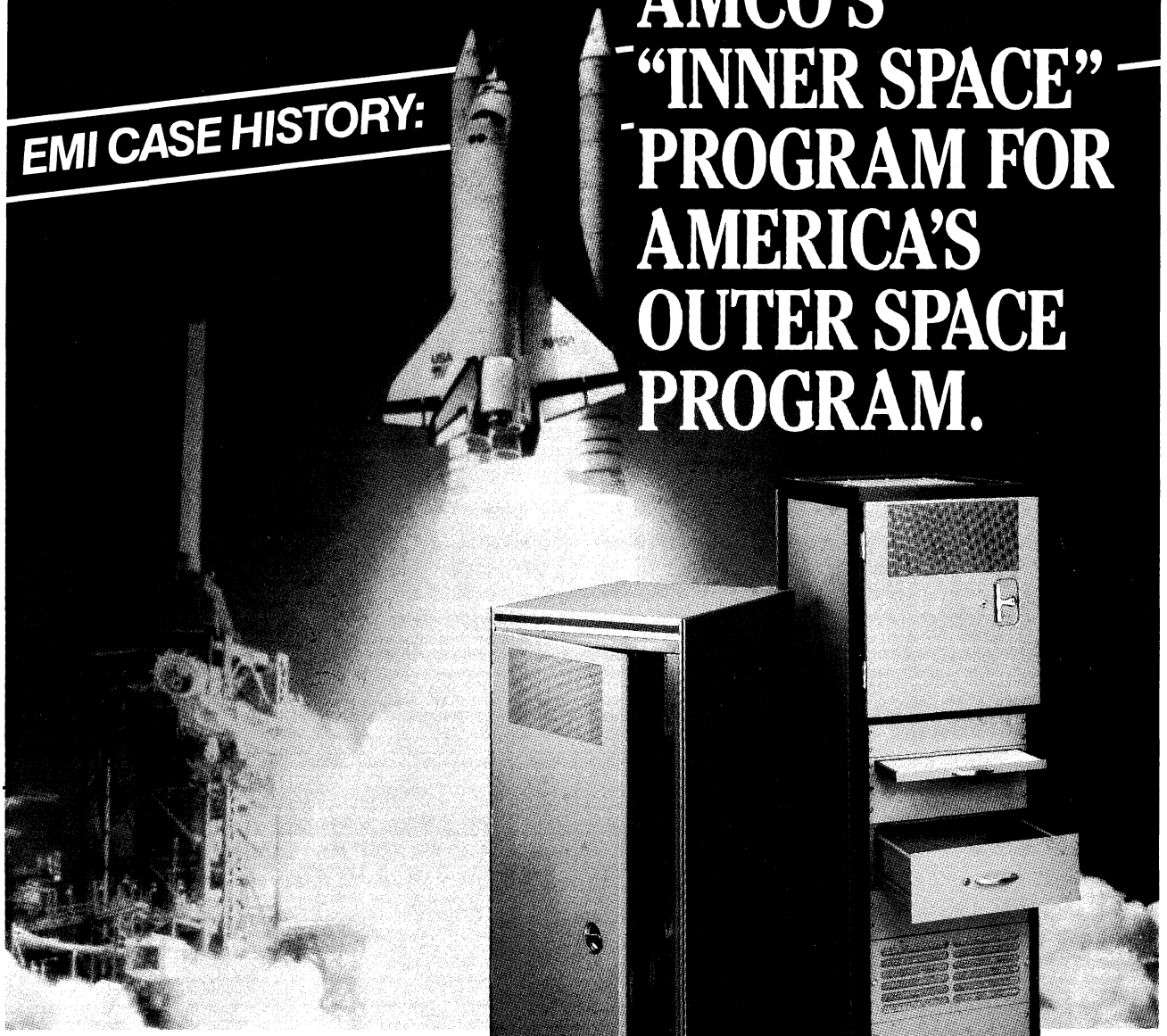

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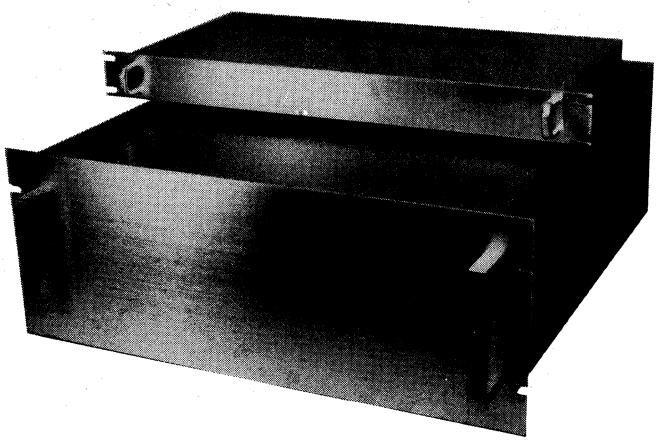
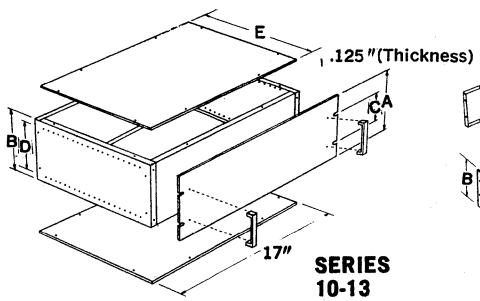
Series 24 are extra heavy gauged all aluminum with 0.09" thick side panels. It provides light weight and strong construction. They are painted in Beige.

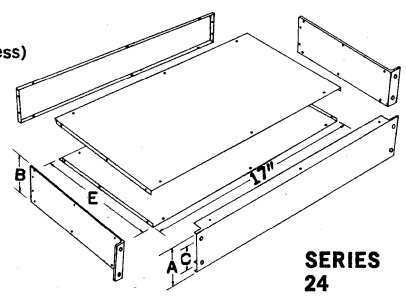
Desk-Top series 54 is same color and construction as series 24. Except there is no mounting ear, and the front panel is clear anodized.



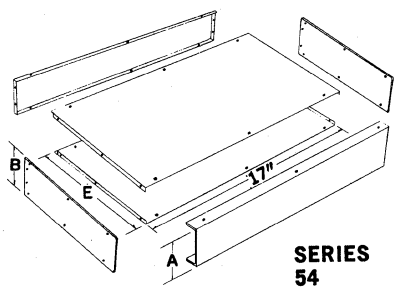
EIA STANDARD 19" Rack Mount Chassis



SERIES 10-13



SERIES 24



SERIES 54

Description	Rack Unit	Dimension (Inch) A	B	C	D	E	Side Panel Thickness (inch)	Black Stock No.	Black Price	Metallic Stock No.	Metallic Price	Ship-Weight (lb)
Steel—Side, Top,	1	1.75	1.50	1.25	0.50	8.00	.04	10-19082	39.50	11-19082	38.75	5
and Bottom	1	1.75	1.50	1.25	0.50	14.00	.04	10-19142	45.15	11-19142	45.00	7
Panels	2	3.50	3.13	3.00	2.00	8.00	.04	10-19083	46.50	11-19083	45.90	7
Aluminum—Back	2	3.50	3.13	3.00	2.00	14.00	.04	10-19143	51.95	11-19143	51.25	8
and Front	3	5.25	4.93	2.25	3.75	8.00	.04	10-19085	52.50	11-19085	51.95	8
Panels	3	5.25	4.93	2.25	3.75	14.00	.04	10-19145	58.60	11-19145	57.95	9
	3	5.25	4.93	2.25	3.75	20.00	.04	10-19205	64.80	11-19205	64.10	12
	4	7.00	6.75	4.00	5.50	8.00	.04	10-19087	56.75	11-19087	55.90	9
	4	7.00	6.75	4.00	5.50	14.00	.04	10-19147	62.50	11-19147	61.95	11
	4	7.00	6.75	4.00	5.50	20.00	.04	10-19207	69.80	11-19207	69.40	13
All Aluminum	1	1.75	1.60	1.25	0.50	11.50	.05	12-19122	59.50	13-19122	58.10	4
Anodized All	2	3.50	3.30	3.00	2.25	11.50	.05	12-19123	65.80	13-19123	64.20	5
Surface	3	5.25	5.07	2.25	4.00	11.50	.05	12-19125	72.50	13-19125	71.00	6
	4	7.00	6.85	4.00	5.75	11.50	.05	12-19127	79.20	13-19127	77.90	7
Heavy Gauged	5	8.75	8.50	5.75	5.50	11.50	.06	12-19129	86.50	13-19129	84.10	10
All Aluminum	6	10.50	10.25	7.50	7.25	11.50	.06	12-19120	91.50	13-19120	89.90	12
Extra Strong	1	1.72	1.62	1.25	—	10.00	.09	24-19102	61.95	54-17102	59.40	4
All Aluminum	2	3.47	3.37	3.00	—	10.00	.09	24-19103	67.75	54-17103	65.20	5
Color Beige	2	3.47	3.37	3.00	—	16.00	.09	24-19163	74.50	54-17163	72.10	6

Other accessories included: Support Rail and Second Front Panels for stronger construction and mounting of various components. Aluminum Blank Panels with excellent Anodized Finish are also available in black or metallic.

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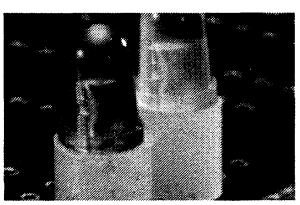

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- ☐ Vertical L.E.D. Mounts
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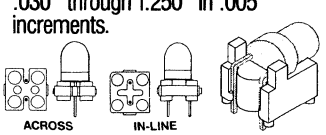
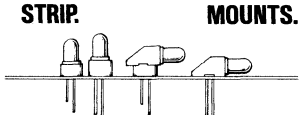
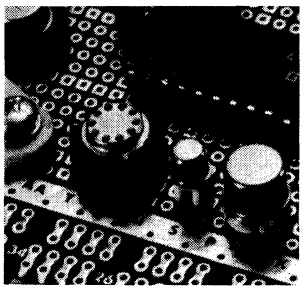


12 (T-1¾) and 15 (T-1) STATION STRIP.

T-1 RIGHT ANGLE MOUNTS.





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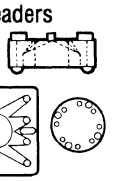

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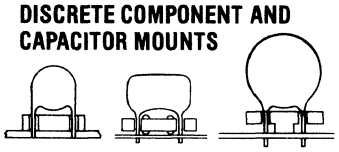

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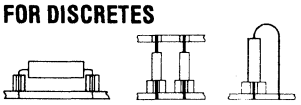

Dual in-line mounts
TO-5/TO-18 covers and shields

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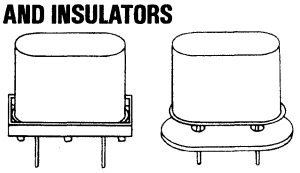

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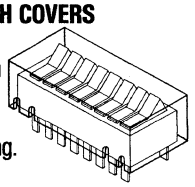
Snap on to protect from accidental changes in programming.



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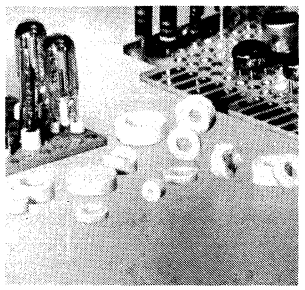

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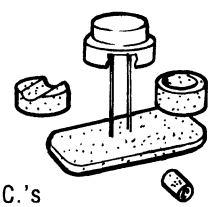

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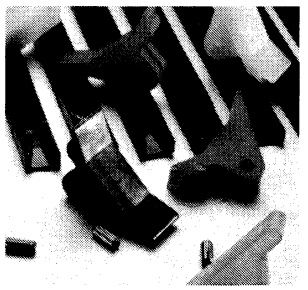

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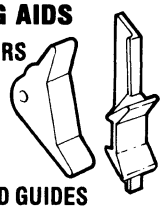
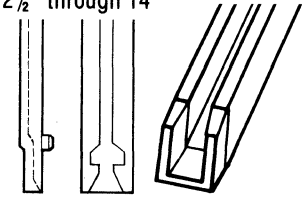
18 standard & locking styles

3 PCB Handles



SNAP-IN CARD GUIDES
52 standard sizes; lengths from 2½″ through 14″



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VERTICAL CARD GUIDES SAVE ADDITIONAL SPACE, REDUCES COST

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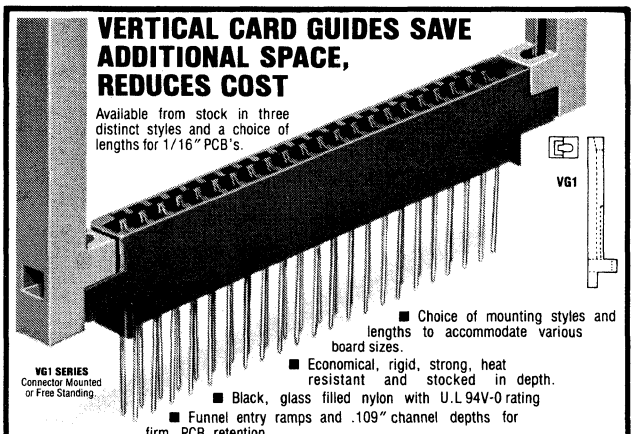

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- Choice of mounting styles and lengths to accommodate various board sizes.
- Economical, rigid, strong, heat resistant and stocked in depth.
- Black, glass filled nylon with U.L 94V-0 rating
- Funnel entry ramps and .109″ channel depths for firm PCB retention

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- Rigidly reinforced and heat resistant.
- Easily installed with standard #6 fasteners. Built-in anti-rotation device.
- Funnel entry ramps with .109″ channel depths.
- 7 standard lengths stocked in depth.

VG3 SERIES

These double sided guides are available from stock, may be used in pairs or in tandem for maximum econoniy and are easily mounted with standard #6 fasteners..

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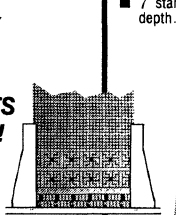
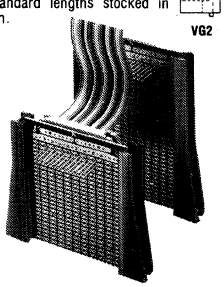
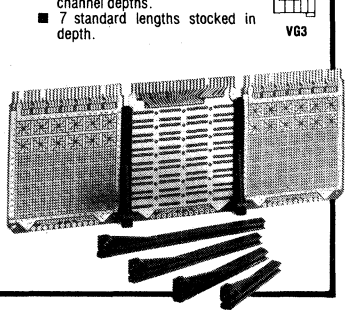
- Easily installed with standard #6 fasteners. Built-in anti-rotation device.
- Funnel entry ramps with .109″ channel depths.
- 7 standard lengths stocked in depth.







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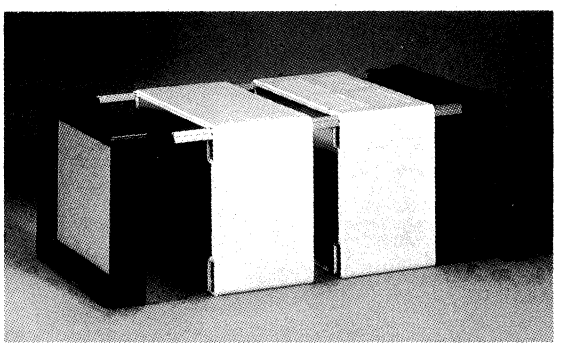
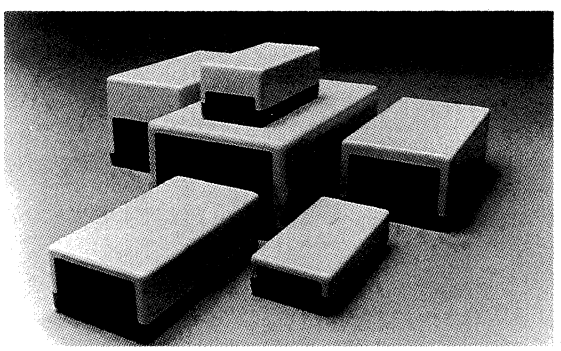
SIX REASONS TO SPECIFY BOPLA

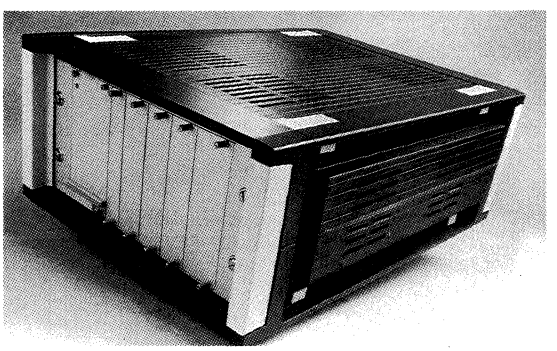


1. Modular "Design Your Own" Enclosure Systems

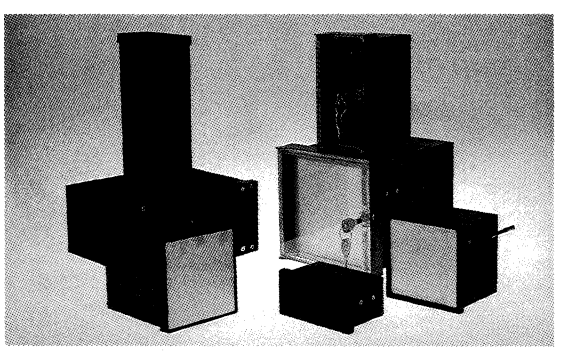
2. Computer-related Housings



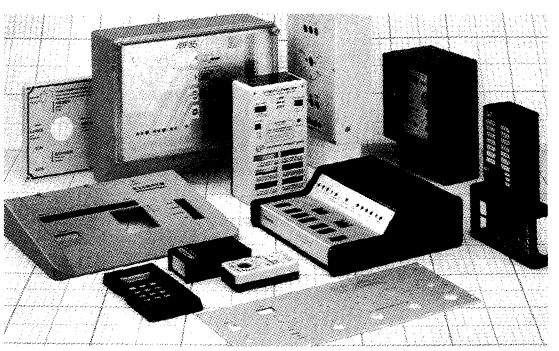
3. Small Instrument Cases



4. Portable Test Equipment Enclosures



5. Panel-mount Housings in DIN Sizes



6. Custom Machining

bopla®
Enclosure Systems

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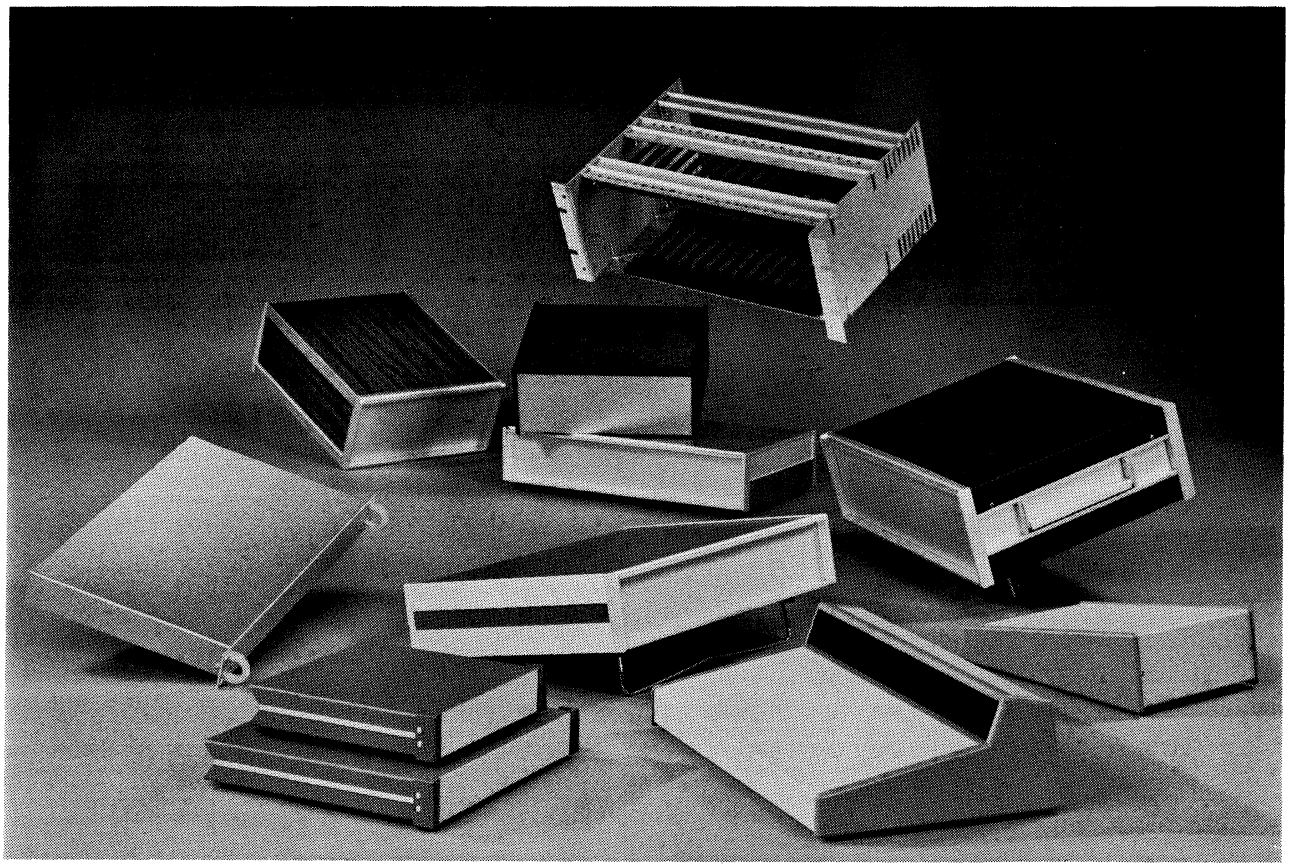
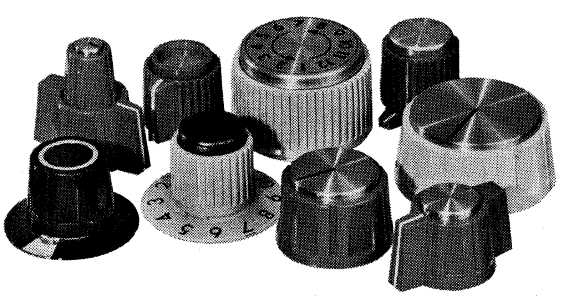
Buckeye



Electronic packaging with a perfect combination of functional design and precision engineering.

CASES • CABINETS • CAGES • CHASSIS KNOBS • COMPONENTS & ACCESSORIES

KNOBS



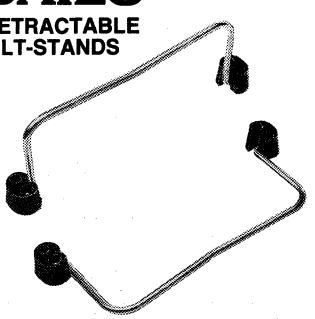
cord-wrap

POWER CORD STORAGE.

MODULAR CARD Guides

BAILS

RETRACTABLE TILT-STANDS



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Buckeye

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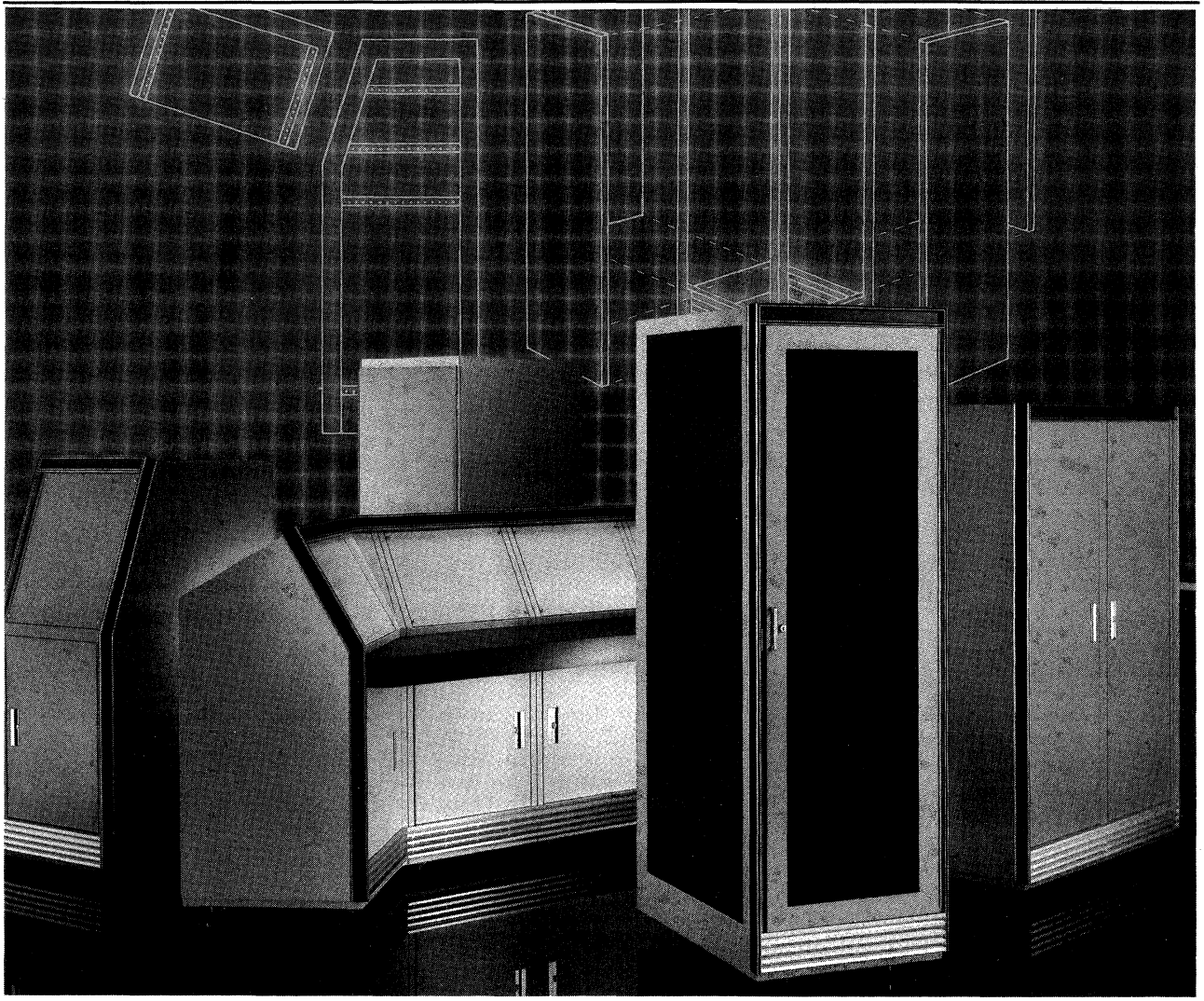
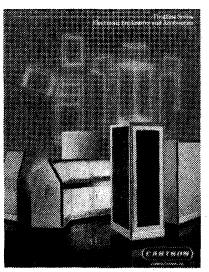


Standard or Modified— Cabtron has the enclosures to make *your* designs work.

Cabtron's electronic enclosures are designed for maximum efficiency—whether used for automatic test equipment, communications, military, security, video, medical, industrial, or other applications. Our large selection of standard sizes, coupled with distinctive styling and a fully integrated, modular parts system, offer you the ultimate design flexibility required in today's market.

Cabtron also offers one of the largest selections of accessories in the industry, while attractive trim packages help you finish your enclosures in style. In addition, our skilled technicians will match any color, punch any size hole, or assemble any cabinet configuration to meet your specifications.

Put Cabtron's more than 20 years' experience in electronic enclosures to work for you. For the name of your local representative and your FREE Firstline catalog, contact Cabtron at:



1-312-498-6090

Standard Features

- 12, 14, or 16 gauge steel frame.
- 11 gauge corner gussets for added strength on vertical rack and console models.
- Horizontal cowlings, vertical frame channel, horizontal top channel, and bottom caster plates all seam welded together for extra strength and rigidity.
- 11 gauge mounting angles have tapped holes on EIA patterns.
- Removable bottom panel for computer floor access.
- Front and rear grills with cleanable air filters engineered to accept exclusive Cabtron blower system.
- Frame provided with knock-outs for easy mounting of casters.
- Casters purchased at time of order installed at no additional charge.
- Free hardware kit includes four 10-32 panel screws for every 8¾" of front panel space and joining hardware for multi-bay configurations.
- Choose from 10 standard textured finishes. Combinations of standard colors available at no additional cost.

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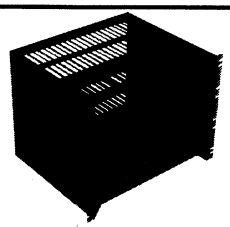
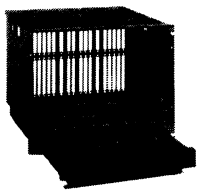
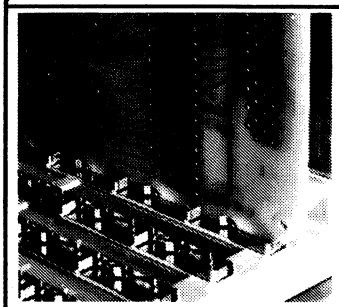
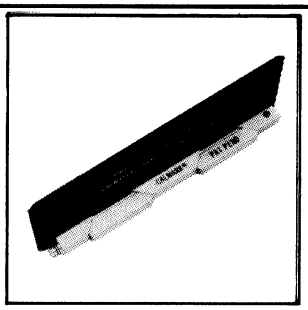




CARD CAGES

Custom designed and fabricated to meet customer requirements.
Also, Eurocages-VMEbus & MULTIBUS II compatible.

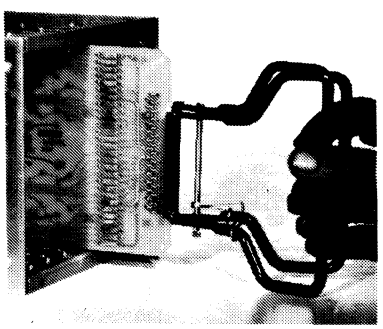




CARD RETAINERS

CARD-LOKS

Excellent thermal and electrical conductivity, plus protection against shock and vibration.

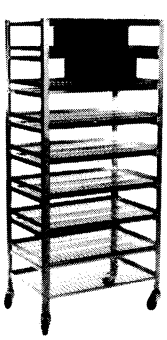


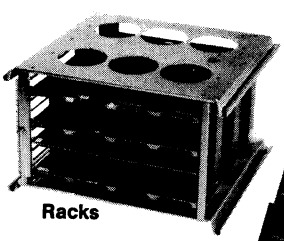
CARD PULLERS

For easy PC card extraction.

PCB HANDLING PRODUCTS

Trays, Racks and Carts for safe and efficient handling, transport, and storage of PC boards during all stages of production. Available with static resistant or conductive material.

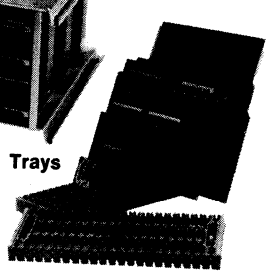


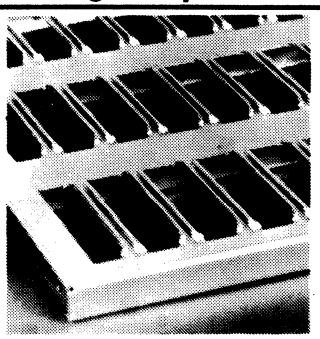


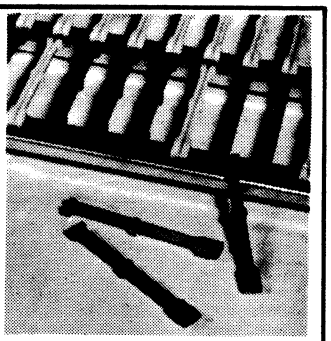
Racks

Carts

Trays



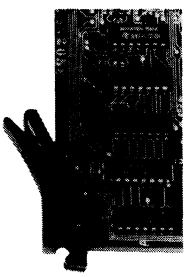




CARD GUIDES

Metal louver and nylon snap-in.

NEW



Series 107-70
Positive Locking
PC Inserter-Extractor

Patent Pending

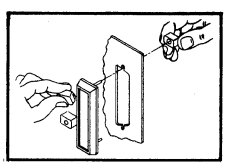
CARD INSERTERS & EXTRACTORS

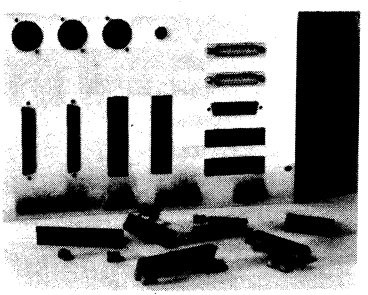
For easy insertion and extraction of cards.

- Available in colors for coding • Generous area for hot stamp marking.
- U.L. Approved • Available with pre-started assembly pins.

CONNECTOR ACCESSORIES

For "D"-subminiature rectangular connectors.

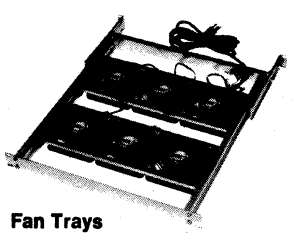




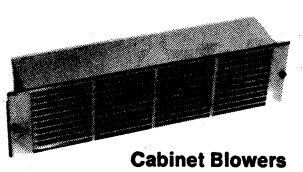
Cutout Covers

ELECTRONIC COOLING PRODUCTS

Fan Tray Assemblies offer standard mounting with multiple and adjustable fan locations. Cabinet Blowers for cooling of electronic rack equipment. For Special Applications Calmark will design an airmover to meet specific requirements.



Fan Trays



Cabinet Blowers

CALMARK® CORPORATION

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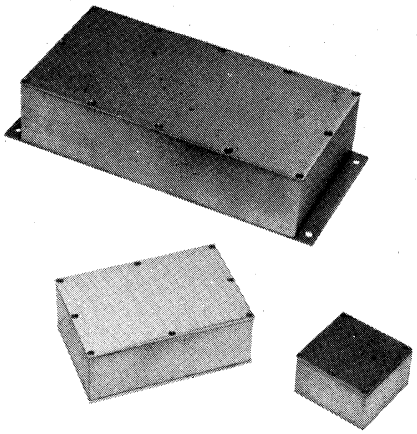
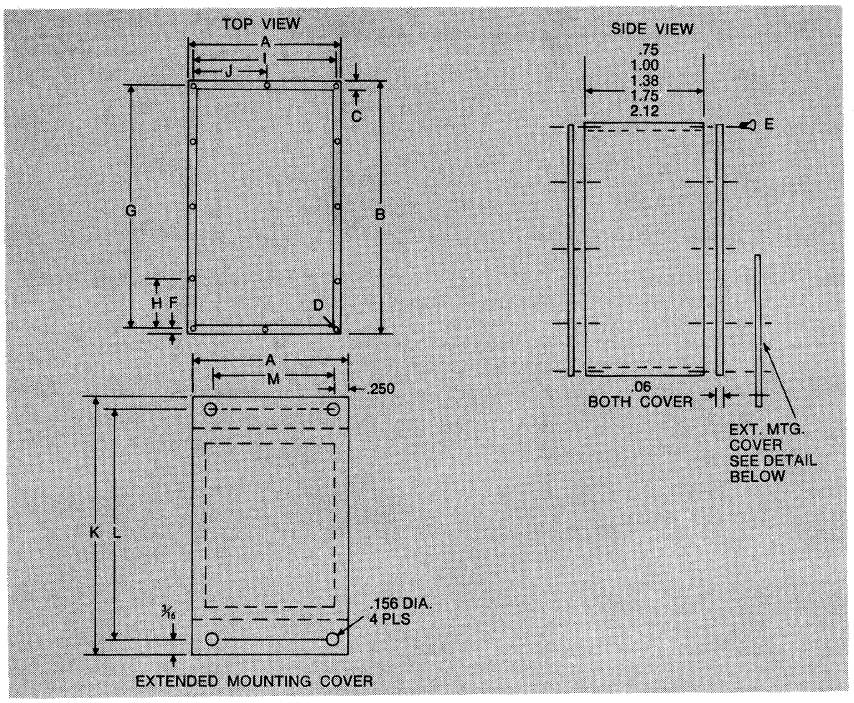
COMPAC™

RFT SERIES





- ☐ Compac's RFT Series Enclosures have shielding capabilities to 60 dB at 3 GHz
- ☐ Independent access from either side
- ☐ Greater Interior Acreage Construction Specs: Case — AL 6063T3 Covers — AL 5052-H32 finish chemical film per MIL C 5541 Class 1 A Conformance to MIL 45208A

HOW TO ORDER:

R-51110 — 138 — 0 (N)

CASE PART NO.

CASE HEIGHT
075 - 0.75
100 - 1.00
138 - 1.38
175 - 1.75
212 - 2.12

COVER TYPE
0 - Standard flush
1 - Extended

ADD FOR NICKEL PLATE

	A	B	C	D*	E	F	G	H	I	J	K	L	M
R51080	1.00	1.00	.125	4	0-80	.070	.860	—	.860	—	1.75	1.375	.50
R51090	1.25	1.25	.125	4	0-80	.070	1.110	—	1.110	—	2.00	1.625	.75
R51095	1.25	2.50	.125	6	0-80	.070	2.360	1.180	1.110	—	3.25	2.875	.75
R51100	1.50	1.50	.125	6	0-80	.070	1.360	.680	1.360	—	2.25	1.875	1.00
R51110	1.50	2.00	.125	6	0-80	.070	1.860	.930	1.360	—	2.75	2.375	1.00
R51120	1.50	2.50	.125	6	0-80	.070	2.360	1.180	1.360	—	3.25	2.875	1.00
R51125	1.50	3.25	.125	6	0-80	.070	3.110	1,555	1.360	—	4.00	3.625	1.00
R51130	1.50	.00	.125	10	0-80	.070	5.860	1.465	1.360	—	6.75	6.375	1.00
R51140	1.75	1.75	.125	6	0-80	.070	1.610	.805	1.610	—	2.50	2.125	1.25
R51150	1.75	3.00	.125	6	0-80	.070	2.860	1.430	1.610	—	3.75	3.375	1.25
R51160	2.00	2.00	.125	8	0-80	.070	1.860	.930	1.860	.930	2.75	2.375	1.50
R51170	2.00	3.00	.125	8	0-80	.070	2.860	1.430	1.860	.930	3.75	3.375	1.50
R51180	2.00	4.00	.125	10	0-80	.070	3.860	1.286	1.860	.930	4.75	4.375	1.50
R51190	2.00	5.00	.125	12	0-80	.070	4.860	1.215	1.860	.930	5.75	5.375	1.50
R51200	2.00	6.00	.125	12	0-80	.070	5.860	1.465	1.860	.930	6.75	6.375	1.50
R51205	2.50	2.50	125	8	0-80	.070	2.360	1.180	2.360	1.180	3.25	2.875	2.00
R51210	3.00	3.00	.125	8	0-80	.070	2.860	1.430	2.860	1.430	3.75	3.375	2.50
R54030	3.00	4.00	.125	10	0-80	.070	3.860	1.287	2.860	1.430	4.750	4.375	2.50
R51235	4.00	4.00	.125	12	0-80	.070	3.860	1.287	3.860	1.287	4.750	4.375	3.50
R51220	3.00	5.00	.125	12	0-80	.070	4.860	1.215	2.860	1.430	5.75	5.375	2.50
R51225	3.00	5.00	.188	12	2-56	.094	4.812	1.203	2.812	1.406	5.75	5.375	2.50
R51230	3.00	6.00	.188	12	2-56	.094	5.812	1.453	2.812	1.406	6.75	6.375	2.50
R51250	5.00	6.00	.188	14	2-56	.094	5.812	1.453	4.812	1.604	6.75	6.375	4.50
R58010	8.00	10.00	.187	16	2-56	.094	9.812	1.962	7.812	2.604	10.750	10.375	7.500

* D = Number of cover screws

Specifications subject to change without notice

CUSTOM
FROM COMPAC'S RFT SERIES

Compac will modify our RFT Series Enclosures to meet your needs.

- Drilling
- Tapping
- Milling
- "D" Punching
- Cut Outs for Subminiature Connections
- Silk Screening, Painting

Work is done from your prints or to your specifications.

For your convenience Compac has included on page 5 a request for quote with a rendering of a Compac Case to depict your modifications.

R51110 — 138 — 0 — (N)/MOD/XXX

CASE PART NO.

CASE HEIGHT
075 - 0.75
100 - 1.00
138 - 1.38
175 - 1.75
212 - 2.12

COVER TYPE
0 - Standard flush
1 - Extended

ADD FOR NICKEL PLATE

YOUR PRINT #

TO ORDER

Select a case size from the RFT series, send a drawing and include: overall height, feedthru location, type (plain Teflon or filter) connector location etc. Our expertise in shielded cases can give you a truly CUSTOM design, limited only by your requirements.

COMPAC
1320-13 LINCOLN AVENUE
HOLBROOK, NEW YORK 11741
TELEPHONE (516) 585-3400
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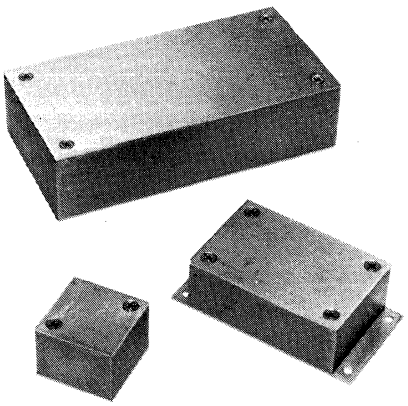
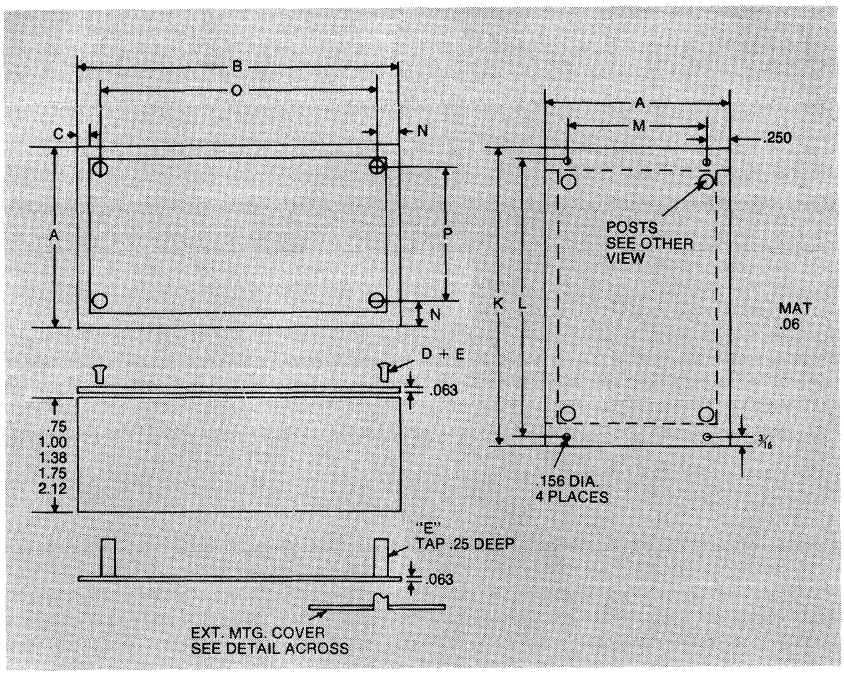
COMPAC™

BLANK SERIES





- ☐ Compac Blank Series Enclosures provide up to 100 dB shielding effectiveness at 100 MHz
- ☐ Easy access and assembly
- ☐ Off-the-shelf availability

CONSTRUCTION SPECS
Frames: 6063-T5QQA200 Extruded Aluminum
Covers: 5052-H32-Aluminum
Standard Finishes
Irridite Chemifilm per MIL C 5541 CL 1 A Conformance to MIL Spec 45208A

HOW TO ORDER:

51110 — 138 — 0 — (N)

CASE PART NO.

CASE HEIGHT
075 - 0.75
100 - 1.00
138 - 1.38
175 - 1.75
212 - 2.12

COVER TYPE
0 - Standard flush
1 - Extended

ADD FOR NICKEL PLATE

	A	B	C	D	E	K	L	M	N	O	P
51080	1.00	1.00	.125	2	4-40	1.75	1.375	.50	.250	.50	.50
51090	1.25	1.25	.125	2	4-40	2.00	1.625	.75	.250	.75	.75
51095	1.25	2.50	.125	4	4-40	3.25	2.875	.75	.250	2.00	.75
51100	1.50	1.50	.125	2	4-40	2.25	1.875	1.00	.250	1.00	1.00
51110	1.50	2.00	.125	4	4-40	2.75	2.375	1.00	.250	1.50	1.00
51120	1.50	2.50	.125	4	6-32	3.25	2.875	1.00	.250	2.00	1.00
51125	1.50	3.25	.125	4	6-32	4.00	3.625	1.00	.250	2.75	1.00
51130	1.50	6.00	.125	4	6-32	6.75	6.375	1.00	.250	5.50	1.00
51140	1.75	1.75	.125	4	6-32	2.50	2.125	1.25	.250	1.25	1.25
51150	1.75	3.00	.125	4	6-32	3.75	3.375	1.25	.250	2.50	1.25
51160	2.00	2.00	.125	4	6-32	2.75	2.375	1.50	.250	1.50	1.50
51170	2.00	3.00	.125	4	6-32	3.75	3.375	1.50	.250	2.50	1.50
51180	2.00	4.00	.125	4	6-32	4.75	4.375	1.50	.250	3.50	1.50
51190	2.00	5.00	.125	4	6-32	5.75	5.375	1.50	.250	4.50	1.50
51200	2.00	6.00	.125	4	6-32	6.75	6.375	1.50	.250	5.50	1.50
51205	2.50	2.50	.125	4	6-32	3.25	2.875	2.00	.250	2.00	2.00
51210	3.00	3.00	.125	4	6-32	3.75	3.375	2.50	.250	2.50	2.50
54030	3.00	4.00	.125	4	6-32	4.750	4.375	2.500	.250	3.50	2.50
51235	4.00	4.00	.125	4	6-32	4.750	4.375	3.500	.250	3.50	3.50
51220	3.00	5.00	.125	4	6-32	5.75	5.375	2.50	.250	4.50	2.50
51225	3.00	5.00	.188	4	6-32	5.75	5.375	2.50	.310	4.38	2.38
51230	3.00	6.00	.188	4	6-32	6.75	6.375	2.50	.310	5.38	2.38
51250	5.00	6.00	.188	4	6-32	6.75	6.375	4.50	.310	5.38	4.38
58010	8.00	10.00	.187	4	6.32	10.75	10.375	7.500	.310	9.330	7.380

Specifications subject to change without notice

CUSTOM FROM COMPAC'S BLANK SERIES

Compac will modify our Blank Series to meet your needs and specifications.

- Drilling
- Tapping
- Milling
- Punching
- Traps for Subminiature Connections
- Silk Screening/Painting

Work is done from your print to your specifications.

For your convenience Compac has included on page 5 a request for quote with a rendering of a Compac Case to depict your modifications.

51110 — 138 — 0 (N)/MOD/XXX

CASE PART NO.

CASE HEIGHT
075 - 0.75
100 - 1.00
138 - 1.38
175 - 1.75
212 - 2.12

COVER TYPE
0 - Standard flush
1 - Extended

ADD FOR NICKEL PLATE

YOUR PRINT #

TO ORDER

Select a case size from the BLANK Series, send a drawing and include: overall height, feedthru location, type (plain Teflon or filter) connector location; etc. Our expertise in shielded cases can give you a truly CUSTOM design, limited only by your requirements.

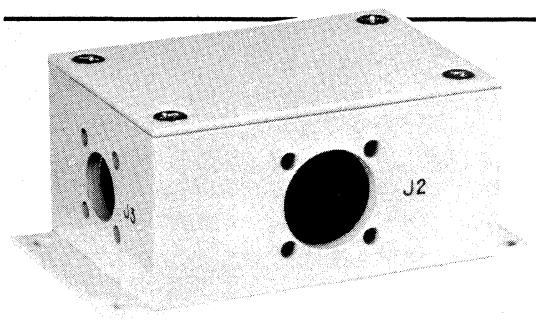
COMPAC
1320-13 LINCOLN AVENUE
HOLBROOK, NEW YORK 11741
TELEPHONE (516) 585-3400
FAX (516) 585-3534

COMPAC™

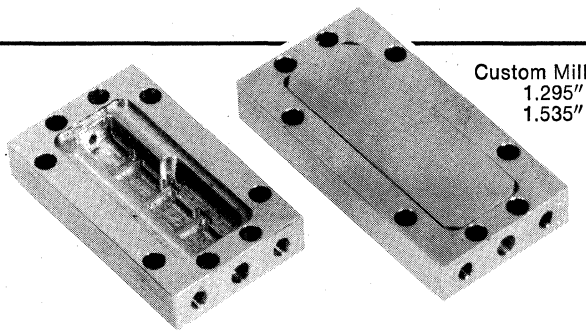
CUSTOM SERIES

Compac's unique product line can easily be tailored to meet your many custom specifications. But if our RFT or Blank Series do not fit your basic requirements, Compac can build a totally custom enclosure quickly and inexpensively. Compac's versatility converts your design into a finished product ready for assembly and installation. All you have to do is supply circuitry!

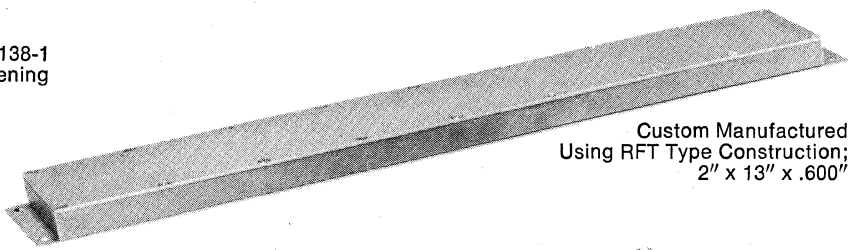
— Print or Detailed Drawings Required —



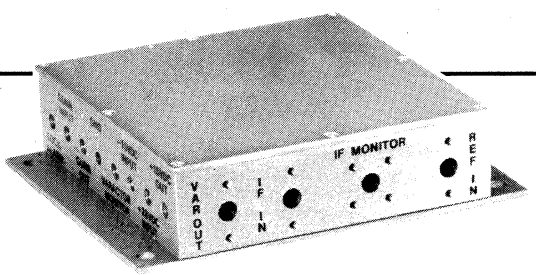
Manufactured from 51170-138-1
with Custom Drilling, Painting, and Silk Screening



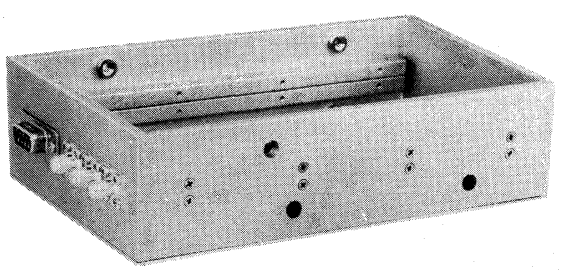
Custom Milled Enclosures,
1.295″ x .765″ x .225″
1.535″ x .765″ x .225″



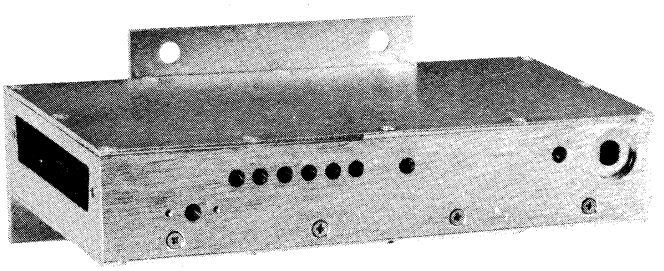
Custom Manufactured
Using RFT Type Construction;
2″ x 13″ x .600″



Manufactured from R51210-075-1 with
Custom Drilling, Tapping, and
Silk Screening



Custom Manufactured
Using RFT Type Construction, 4.00″ x 7.00″ x 2.00″
Showing Mounting Bars, Custom Drilling for
Hardware and Connectors



Manufactured from R51230-100-0(N)
Showing Custom Mounting Plate
Drilling, Milling and "D" Punching

COMPAC
1320-13 LINCOLN AVENUE
HOLBROOK, NEW YORK 11741
TELEPHONE (516) 585-3400
FAX (516) 585-3534

Not Limited To
Examples Shown; COMPAC
Can Build To Your Specifications

COMPAC™

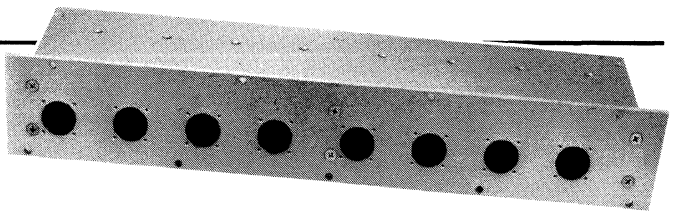
CUSTOM SERIES

SERVICES

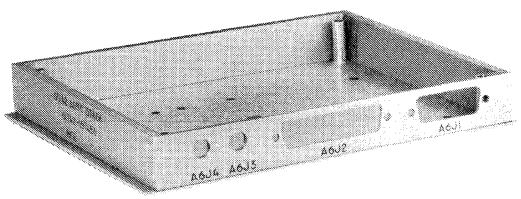
Milling — Enclosures, Channel, Grooves, as Required
Holes — Drilled or Punched
Material Thickness — To Your Specifications
Silk Screening or Painting
Construction Methods — Extrusion, Die Cast, Brazed, or Milled
Covers — To Your Specifications

ADVANTAGES OF A CUSTOM ENCLOSURE

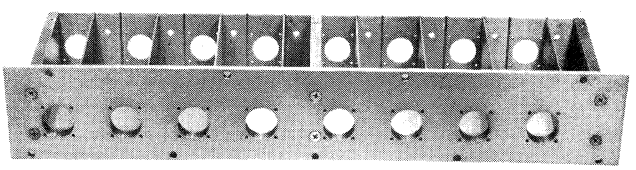
— Low Cost
— To your Exacting Specifications
— Short Lead Times
— Prototype to Production Quantity
— Finished Product Ready for Assembly
— With or Without Connectors & Filters



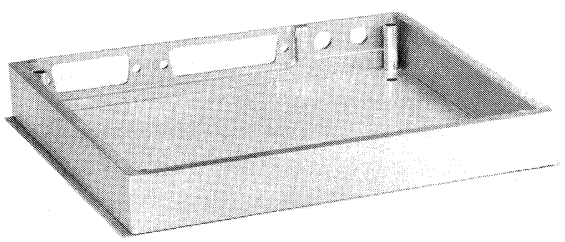
Custom Manufactured to Customer Spec's 19.00″ x 4.00″ x 6.00″



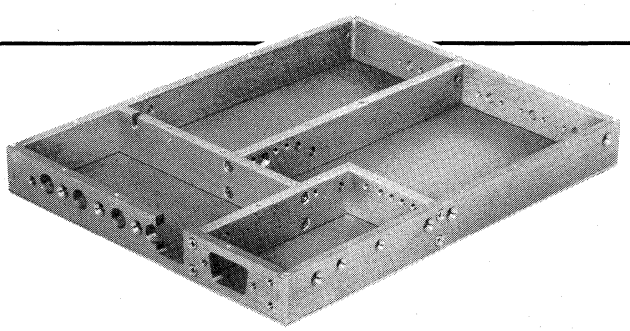
Custom Manufactured Blank Series Construction, 5.00″ x 6.00″ x .75″ Flat and Parallel to .001″ with Custom Milling, Drilling, "D" Punching and Silk Screening



View of above Enclosure Showing Interior and Partitions



View of Above Enclosure Showing Interior Milling

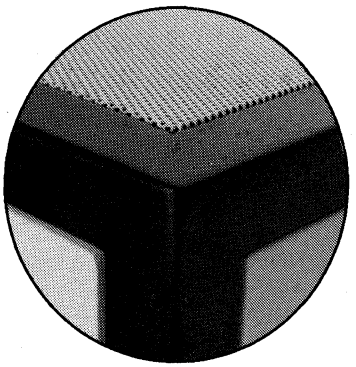


Custom Manufactured using RFT Construction 6.00″ x 8.00.″ x .75″, Show Custom Drilling, Milling, Counter Sinking, and Custom Partitions

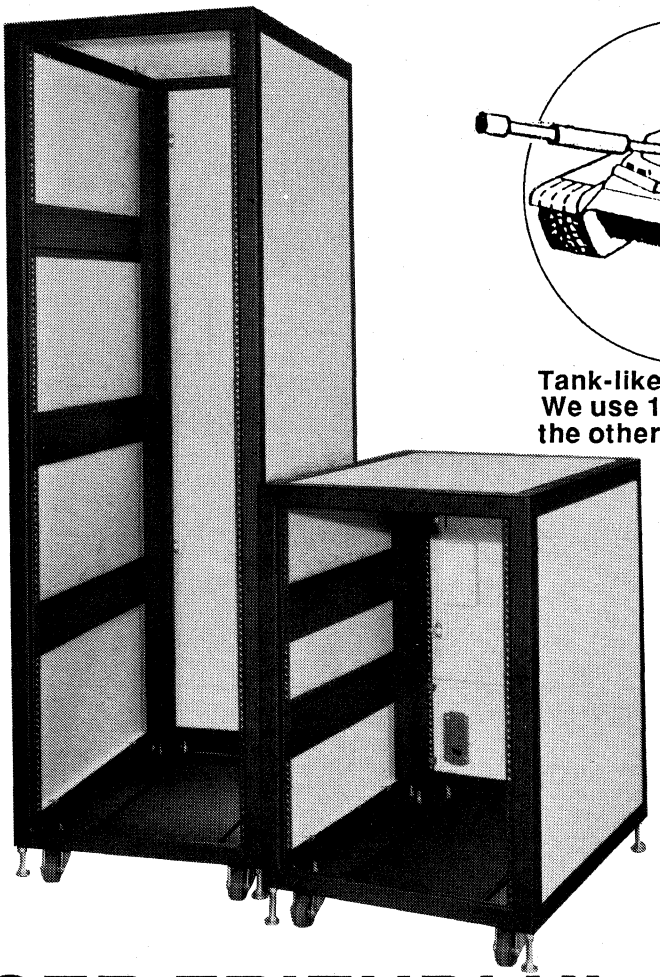
Quantities from 1 pc thru production

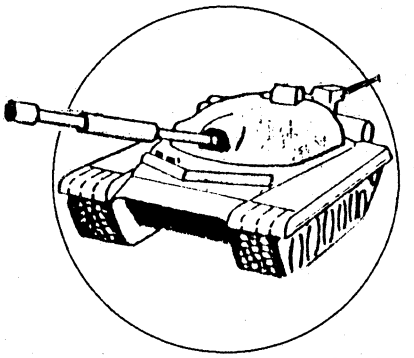
COMPAC
1320-13 LINCOLN AVENUE
HOLBROOK, NEW YORK 11741
TELEPHONE (516) 585-3400
FAX (516) 585-3534

CRISSMAN Cabinets... for Multibus, Multibus II, VMEbus and other Equipment designed for 19" rack mounting.

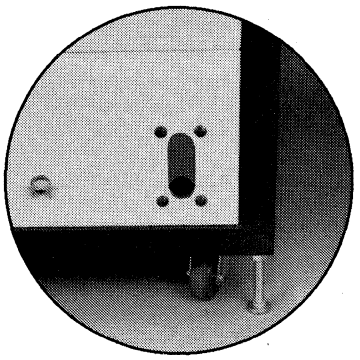


Radius Corners!
The best in the industry!





Tank-like construction!
We use 10 gauge steel,
the others use 13 to 16.



Rugged Casters built-in!
Including levelers.

"User Friendly" because they come assembled, ready to populate

USER FRIENDLY!

Comes fully assembled with Side Panels, Access Door, Perforated Top & Bottom Panels, Castors and Your Colors. Reusable Dust-free Shipping Container...populate & ship.

Supreme Quality Features

- Strong! Rigid! Twice others.
- Attractive! High-Tech styling.
- Standard & Custom!
- Access Door options!
- Wire Management options!
- Price Performance Personified!
- Keyboard Drawers!
- Paper Management Drawers!
- Printer Drawers & Paper Catcher.
- EPO & Connector Panel options!
- Choice of color schemes.
- Cooling options!

Cabinet Dimensions

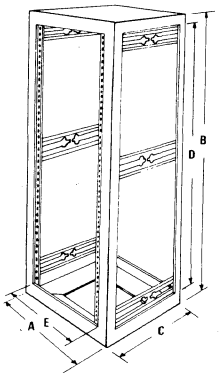
Working Dimensions Height (Inches)	Working Dimensions Depth (Inches)	Series	Overall Dimensions "A" (Inches)	Overall Dimensions "B" (Inches)
28.125	27.93	CMC-1.0	31.682	30.0
61.375	27.93	CMC-1.8	64.875	30.0
65.875	27.93	CMC-XT	69.385	30.0
65.875	32.43	CMC-XTX	69.385	30.0

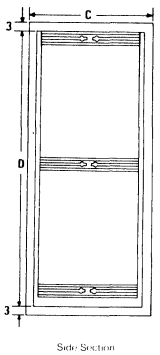
CRISSMAN MANUFACTURING COMPANY

11004 Bakley Street • Huntley, IL 60142 • TEL: 312/669-3995 • 1-800-433-3917 • FAX: 312/669-5168

Electronic Enclosure Systems... By D.L. Custom

VERTICAL ENCLOSURES





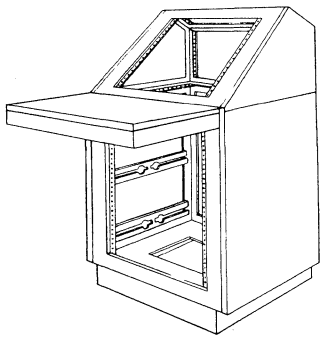
Side Section

• 14 ga. CRS frame • 12 ga. CRS mounting angles • Fully seam welded • Corner posts recessed 1/2" to panel mounting angle • 10" x 10" cutout with cover plate in bottom • One pair of mounting angles • Four levellers mounted on frame • Open tops available—please specify

D.L. Vertical Enclosures offer modern, streamline styling, standard panel openings, accessibility, for multi-bay systems and a distinctive looking dress trim.

Our enclosures compliment our customer's product and offers protection while in transit and particularly while in use. Our high-strength-to-weight design is a unique feature we recommend you consider.

CONSOLES



MATERIALS:
- 14 ga. CRS turret
- 14 ga. pedestal
- Formica writing tops (pressure bonded to particle board)

CONSTRUCTION
- Seam welded (all welds ground smooth)

FINISH
- Textured or smooth baked on enamel.

The D.L. line of consoles may be used in a variety of arrangements. Standard door and panel options, either plain or louvered, are available; as well as a complete selection of standard or special colours, plus two-tone combinations.

Our engineering facilities are well staffed to service your problem areas and assist in standard assemblies. We welcome your inquiries.

Consider these features:
- Any turret shape can be designed to suit your individual packaging requirements.
- Multiple, semi-circular or special configurations are available.
- Ease of access to turret top and base.
- Turret top or base may be ordered separately.
- Choose from five standard D.L. Console face openings. Any opening can easily be standardized, based on the D.L. Console style.
- Each opening comes with mounting angles.

EMI-RFI SHIELD ENCLOSURES

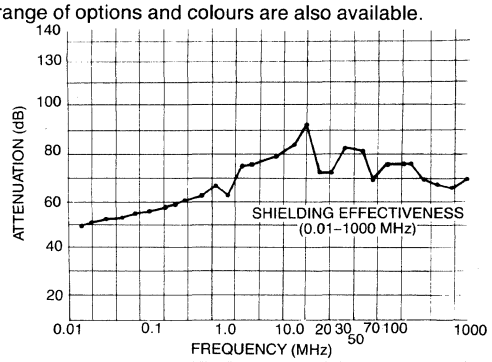
D.L. CUSTOMS E.M.I. R.F.I. Shielded Enclosures

Frame Construction:
- 14 ga. Frame fully seam welded
- Zinc plated for E.M.I. R.F.I. Shielding
- Locking front & rear door
- Sealed top & bottom panel
- 12 ga. Zinc plated mtg. rails (tapped 10/32)
- 16 ga. Doors & Side panels
- Recessed base

Also available 23" and 24" Rack mtg. Shielded Enclosures.

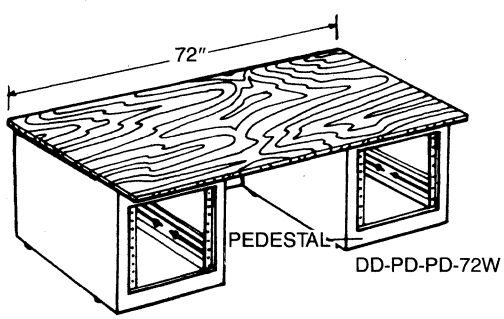
Shielding tests were conducted to Mil. standard 285.
A Nominal 65 D.B. Shielding effectiveness through the frequency range of 20MHz to 1000MHz with results as high as 85 D.B. at some levels. Full test results available.

A full range of options and colours are also available.



DATA DESK

Data desks are designed for computer room environment, where modern styling and functional requirements are a must. These desks are built rugged to take heavy electronic equipment placed on the work surface and the pedestal section allows for rack mounting of electronic equipment. Pedestals have the same capabilities as a vertical enclosure. Also drawer files may be added to enable the desk to be used as a conventional desk.



DLCustom
7250 Victoria Park Avenue,
Markham, Ontario. L3R 2M5
Telephone (416) 475-0275
FAX 416-475-0602

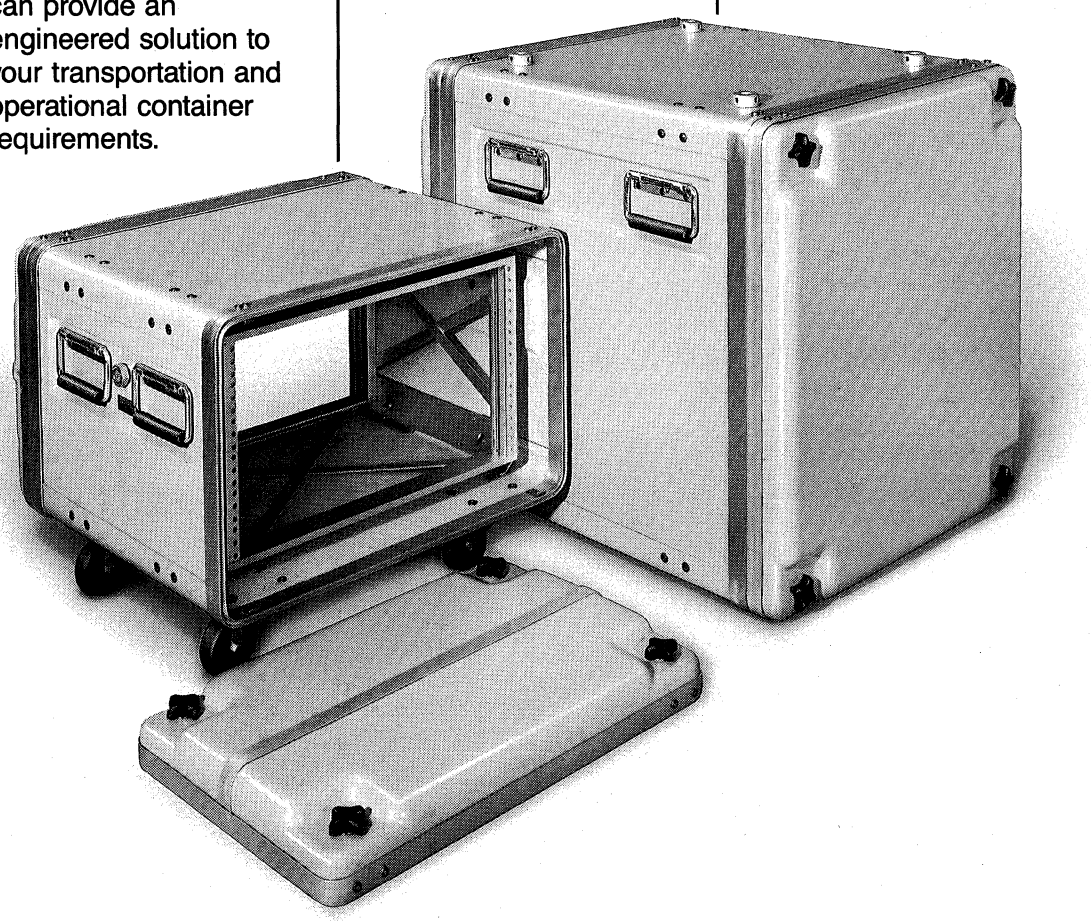
ECS COMPOSITES

INNOVATIVE SOLUTIONS FOR YOUR TRANSPORTATION AND OPERATIONAL REQUIREMENTS

Headed for a missile test shot on Kwajalein, providing satellite communications for heads of state, or transporting your test equipment on the airline...ECS Composites can provide an engineered solution to your transportation and operational container requirements.

ECS electronic enclosures...

Transportable protection for all 19 inch rack mounted equipment. Originally patented by ECS in 1965 (U.S. Patent 3,482,895). Now in the third generation of improved design and performance.



ECS enclosures are available in 185 pre-engineered sizes:

Rack heights from 3 units to 27 units of vertical space.

Standard front-to-rear depths of 8.63", 13.78", 18.90", 20.00" and 24.00".

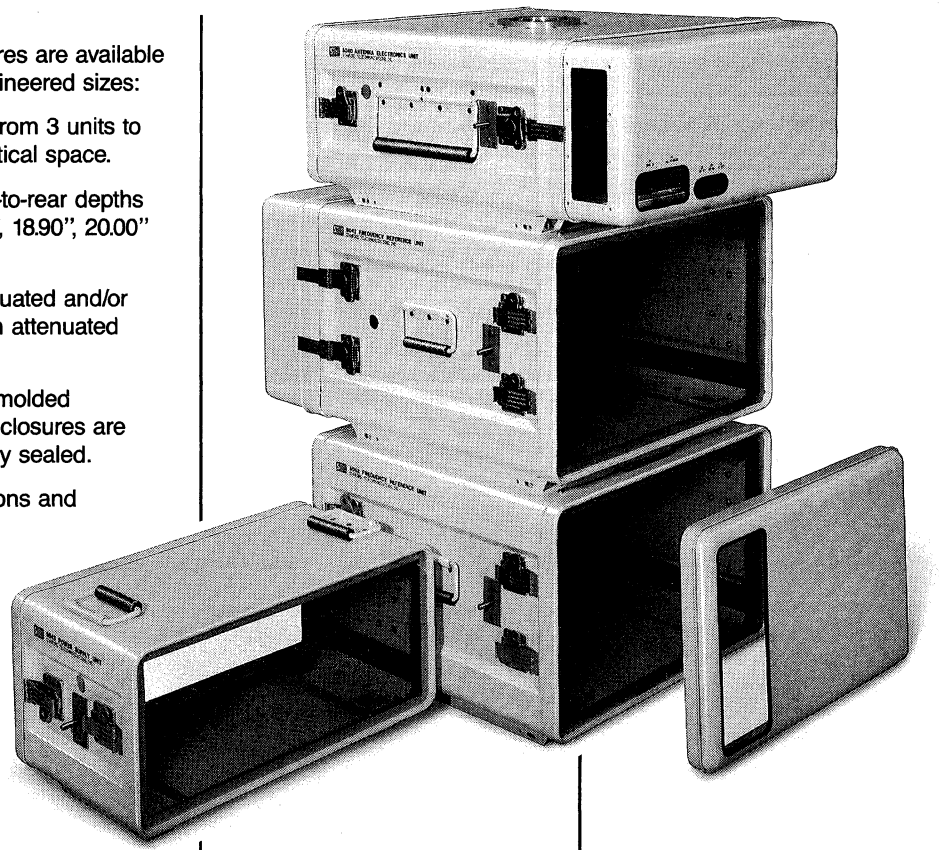
Vibration attenuated and/or shock/vibration attenuated options.

Compression molded composites enclosures are environmentally sealed.

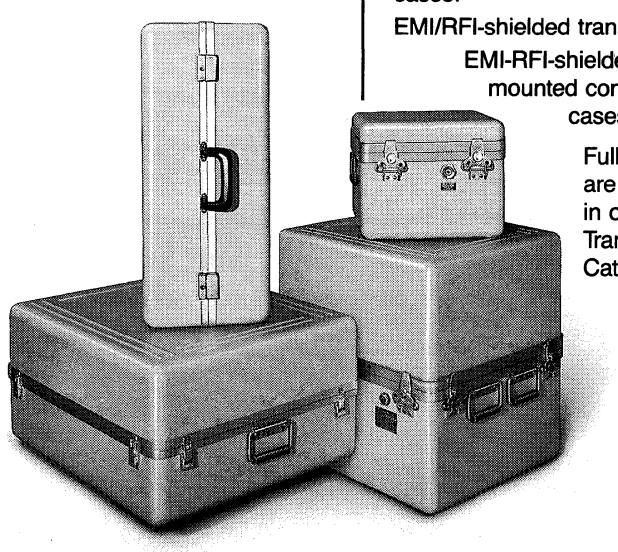
Complete options and accessory list.

Commercial and military versions.

All of this is detailed for you in our 19 Inch Enclosure Catalogue.



ECS Composites engineering staff stands ready to provide assistance where pre-engineered designs don't meet your requirements. ECS has 25 years of experience in designing transportable electronic enclosures to meet specific requirements.



A complete line of transit cases is available to meet your other container requirements:

Rainproof valise cases.

Commercial duty transit cases.

Heavy duty transit cases.

Flange mounted combination cases.

EMI/RFI-shielded transit cases.

EMI-RFI-shielded, flange mounted combination cases.

Full details are available in our Transit Case Catalogue.

New this year...
CADCASE—an ECS developed IBM compatible computer based case design system. ECS has integrated commercially available software into a low cost PC system permitting you to design cases at your location.

Features include minimum equipment and software investment, electronic transfer capability and a library of ECS hardware options. CADCASE includes software, installation and training at your location.

Write or call today for configuration specifications.

For further information or to order your catalogues write or call:

ECS COMPOSITES
3562 Rogue River Highway / P.O. Box 188
Grants Pass, Oregon 97526
(503) 476-8871
TWX 510-755-0777
FAX 503-474-2479

EG&G BIRTCHER

- *Electronic Packaging Products*
- *Custom Metal Fabrication*
- *Printed Circuit Board Hardware*

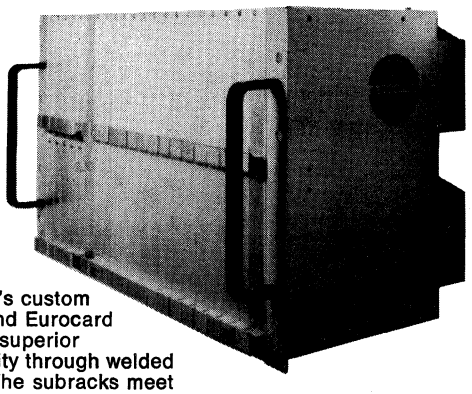
LEADERSHIP IN PC BOARD RETAINER TECHNOLOGY

EG&G Birtcher is a manufacturer of high quality custom and standard products for the electronics industry. We are the leading manufacturer of precision retentive and locking card guides and custom sheet metal racks, chassis and enclosures. We fabricate custom extruded aluminum heat sinks and thermally conductive mil grade enclosures.

QUALITY ASSURANCE

The EG&G Birtcher quality assurance program is in compliance with MIL-I-45208A and MIL-STD-45662. Inspection personnel are trained in Statistical Process Control (SPC). Expertly trained personnel inspect all phases of work to maintain EG&G Birtcher's high quality standards. Receiving, in-process and final inspection are all part of our rigorous quality assurance program.

CUSTOM 6U VME SUBRACK



EG&G Birtcher's custom rugged VME and Eurocard subracks offer superior structural rigidity through welded construction. The subracks meet documented VME Product Specifications per the VMEbus Manual, Revisions C.1. Euro-subracks meet specifications per IEC 297-3 and DIN 41494, Parts 1 and 5.

SHEET METAL CAPABILITIES

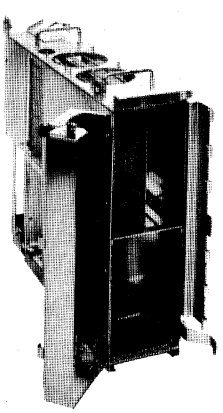
Available to all EG&G Birtcher customers are the combined resources of the Birtcher facilities and broad spectrum of technical and manufacturing knowledge.

Our fully equipped 60,000 square-foot plant with its top-of-the-line equipment enables us to fill almost any customer requirement including design, shearing, piercing, bending, milling, welding, chemical finishing and painting, silk screening and assembly of hardware.

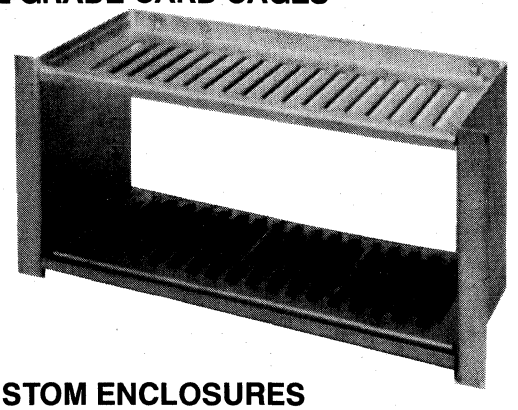
CUSTOM FABRICATION

POWER SUPPLY CHASSIS

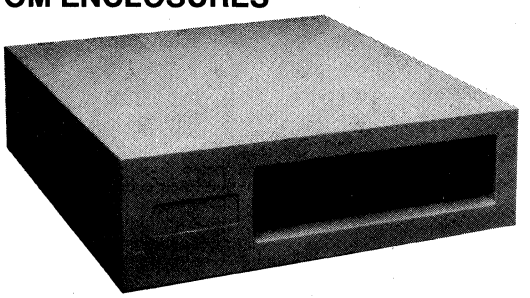
This custom power supply chassis is fabricated from cold rolled steel and perforated sheet metal, complete with formed metal guides, weld studs, self clinching fasteners, grommets, spring clips, hinges and a zinc-plated finish. The chassis is manufactured at a rate of 400 per week utilizing sophisticated numerically controlled punch presses and forming machinery plus welding, stamping, machining and plating.

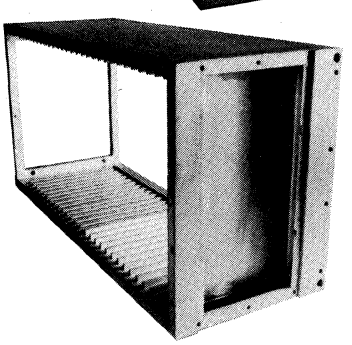


MIL-GRADE CARD CAGES



CUSTOM ENCLOSURES

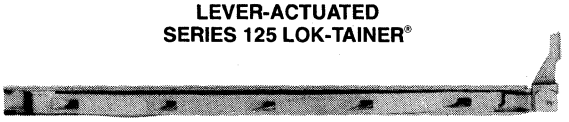




This custom milled and brazed aluminum chassis with five-piece, self-aligning Wedge-Lok™ retainers is an example of the type of Hi-Rel products produced by EG&G Birtcher.

LEVER-ACTUATED HIGH PERFORMANCE SERIES 125 LOK-TAINER®

LEVER-ACTUATED SERIES 125 LOK-TAINER®



PATENT PENDING **RIGHT HAND MODEL SHOWN**

FEATURES

- No Tools Required To Lock Or Unlock PC Board
- Unique Cam Detent Prevents Unlocking During Shock and Vibration
- Visual Locking Indicator With Failsafe Design
- Constant Pressure Insures Uniform Heat Transfer
- Field Repairable
- Low Thermal Resistance (<2°C/Watt/In)

APPLICATIONS

- Shipboard-Airborne-Space
- Designed To Meet Requirements Of MIL-STD-901 And MIL-STD-810
- SEM-A-B-C-D&E
- 1/4, 1/2, 3/4, And Full ATR Modules
- Line Replaceable Modules (LRM)

LEADERSHIP IN DESIGN SOLUTIONS TO YOUR PCB SHOCK, VIBRATION AND THERMAL PROBLEMS

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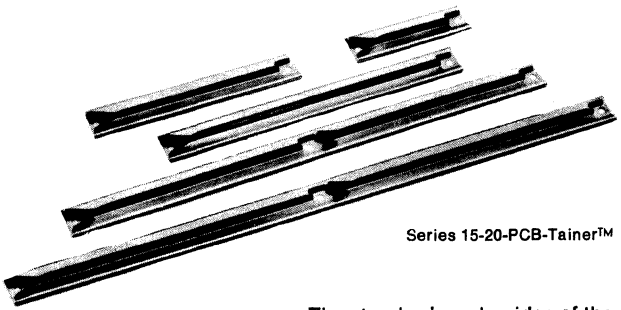
EG&G BIRTCHER

- *Electronic Packaging Products*
- *Custom Metal Fabrication*
- *Printed Circuit Board Hardware*

LEADERSHIP IN PC BOARD RETAINER TECHNOLOGY

PCB-TAINER™ CARD GUIDES

Patent No. 3,186,554



Series 15-20-PCB-Tainer™

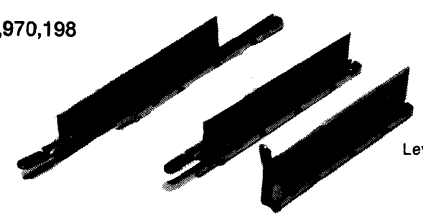
The standard card guides of the industry, EG&G Birtcher's patented PCB-Tainer™ card guides provide an economical way of securely fastening PC boards. EG&G Birtcher PCB-Tainer™ card guides come in standard or made-to-spec versions. They are made of cold rolled steel or beryllium copper for rivet, weld or adhesive bonding installation. They provide heat dissipation, electrical grounding, retention in shock and vibration applications.

SERIES 38 SNAP-TAINER™ CARD GUIDE

- Provides a snap in feature which saves installation time
- Requires no custom installation tools
- Made of Beryllium Copper to provide electrical grounding and retention without riveting or screws

LOK-TAINER® RETAINERS

Pat. No. 3,970,198



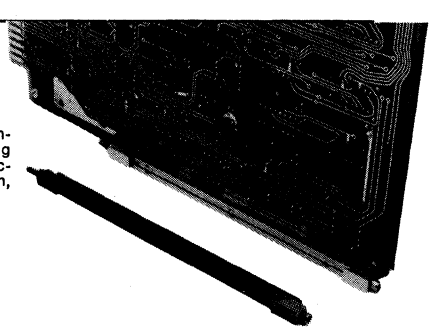
Series 24
Lever Actuated
Lok-Tainer®

Series 27
Screw Actuated Lok-Tainer®

EG&G Birtcher patented screw and lever actuated Lok-Tainer® locking retainers are designed to provide high resistance to heavy shock and vibration while maintaining maximum contact for heat dissipation.

SERIES 40 WEDGE LOK™

Meets or exceeds the performance requirements of drawing 84103 Rev. A, Defence Electronics Supply Center, Dayton, OH 45444.

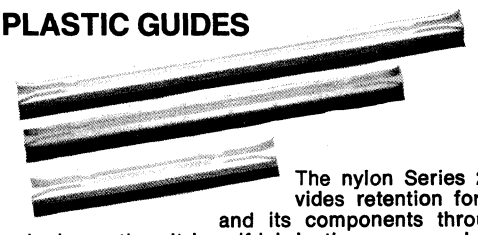


EXTRACTORS CARD HANDLES, AND INJECTOR/EXTRACTORS FOR PC BOARDS

Injectors/Extractors

Extractors provide for quick, damage free, removal of PC card. Injector/Extractors function in two different directions allowing the card to be easily inserted into the connector as well as providing quick removal.

PLASTIC GUIDES

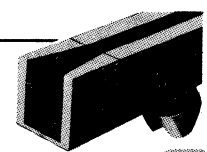


Series 26
Plastic Guides

The nylon Series 26 Guide provides retention for the PC card and its components through a unique gripping action. It is self-lubricating, non conductive with superior strength and durability.

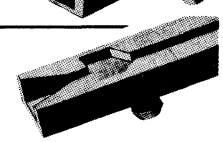
DEEP CHANNEL GUIDES

Nylon Type 6/6
For 1/16" and 1/8" P.C.B.'s



SPACE SAVER GUIDES

Nylon Type 6/6
For 1/16" P.C.B.'s



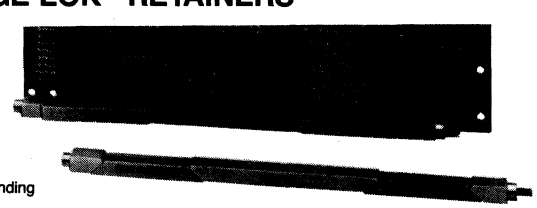
WEDGE-LOK™ LOCKING RETAINERS

For high-reL performance in commercial, industrial or military applications, secure PC boards with Wedge-Lok™ locking card retainers. LOW COST STANDARD VERSIONS ARE AVAILABLE FROM STOCK.

SERIES 41 WEDGE-LOK™ RETAINERS

LOW PROFILE VERSION OF 40 SERIES

SELF-ALIGNING FIVE-PIECE WEDGE-LOK™ RETAINERS



Patent Pending

EG&G Birtcher offers self-aligning Wedge-Lok™ Series, 40-5 and 42-5 designed for heavy shock, vibration and heat dissipation, in cold plate/heat sinking applications. Features zero entry force for insertion and removal of PC boards. Other standard and custom styles available. Visual indicator for locked and unlocked position available as an option.

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"EXCELLENCE IN ENGINEERING"

modular technical furnishings

Division of Impert Industries, Inc. • 557 W. M-89 Highway • Ostego, MI 49078 • 1-800-225-3532 • in Michigan 616-694-2058 • call for FAX No.

MODEL ET 6000...an investment that pays off.

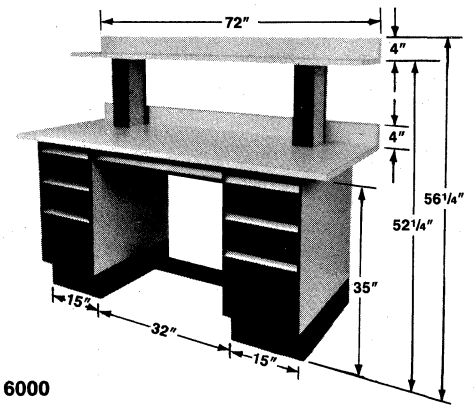
Electra-Tec™ technical work centers are designed with advanced features to help organize your work stations efficiently and comfortably.

Standard in-stock shelves, tops and backguards are white laminated plastic over 1¼" thick flakeboard core. Also available in 2". Other colors and materials are available.

Comes complete with two base cabinets consisting of four large capacity drawers, one file drawer and a spacious door cabinet.

Foot rest is standard equipment.

Twelve grounded outlets are located in two shelf supports, each incorporating an illuminated combination on/off switch, circuit breaker, that is shielded to prevent accidental tripping.

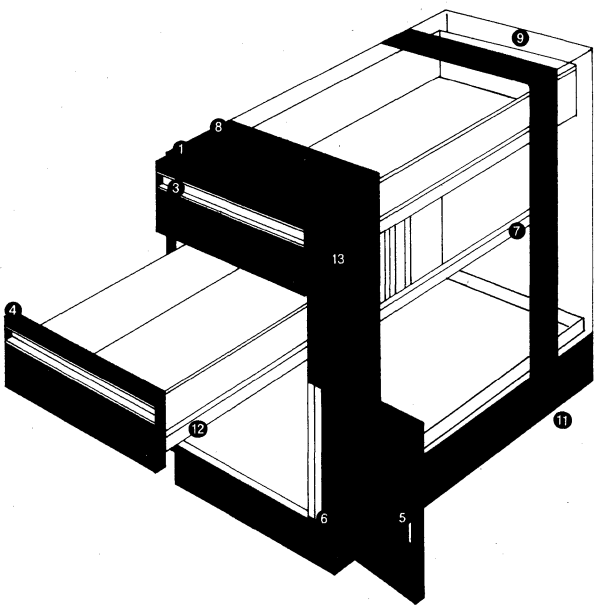


MODEL ET 6000

ELECTRA•TEC™...engineered and built to last.

① All cabinets are constructed of rugged furniture grade steel.
② Welded construction throughout.
③ Full width recessed anodized aluminum drawer and door handles.
④ Full 1⅛" thick double wall door and drawer fronts.
⑤ Magnetic door latch.
⑥ Nickel-plated door hinge.
⑦ Precision drawer slide mounts allow interchange of drawers in the field.
⑧ Rigid internal frame structure to maintain a true and square cabinet.
⑨ Removable rear access panel with electrical knockouts.
⑩ High-quality, durable finish in attractive colors.
⑪ Adjustable floor levelers.
⑫ All drawers are on precision ball bearing slides for effortless, silent operation.
⑬ Security key locks may be installed in the field or at the factory.
⑭ Single lock assembly on each cabinet secures doors and drawers.
⑮ Easy modular installation at your site.

Engineering, testing, R&D, any technical application...an investment in an Electra-Tec™ Work Station is an investment that pays off in improved quality and productivity.



• Laminated Work Surfaces High Impact & Static Dissipative

Our most popular high impact laminant on 45lb density core. Standard self edged surfaces are 1¼ inches thick in white, other colors available. Also available in 2" thickness and static-free surfaces.

High impact countertops may also be ordered with beveled comfort edge, post formed or radius-corner vinyl "T" edge as shown.

Shelves are 1¼" thick.

• Laminated Maple Hardwood

Highest quality "Wood Welded" laminated maple butcher block made in Michigan, U.S.A.

Laminations are placed on edge and bonded into a single, wrap resistant, self supporting panel.

Each work surface has a urethane oil finish.

Bench tops are 1¾" and 2¼" thick and shelves are 1¼" thick.

• Durcon Epoxy Resin

Durcon work surfaces are not coated or laminated. Resistant to staining and corrosion by most harsh chemicals. Strong and tough for resistance to impact damage, heat resistance, non-porous, smooth and easy to maintain, and a non-conductor. The soft black low-glare appearance will compliment both modern and traditional laboratory installations. Bench tops and shelves are 1¼" thick.

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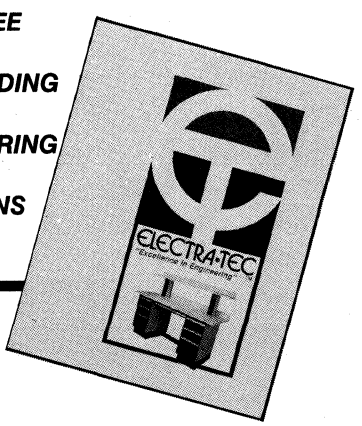
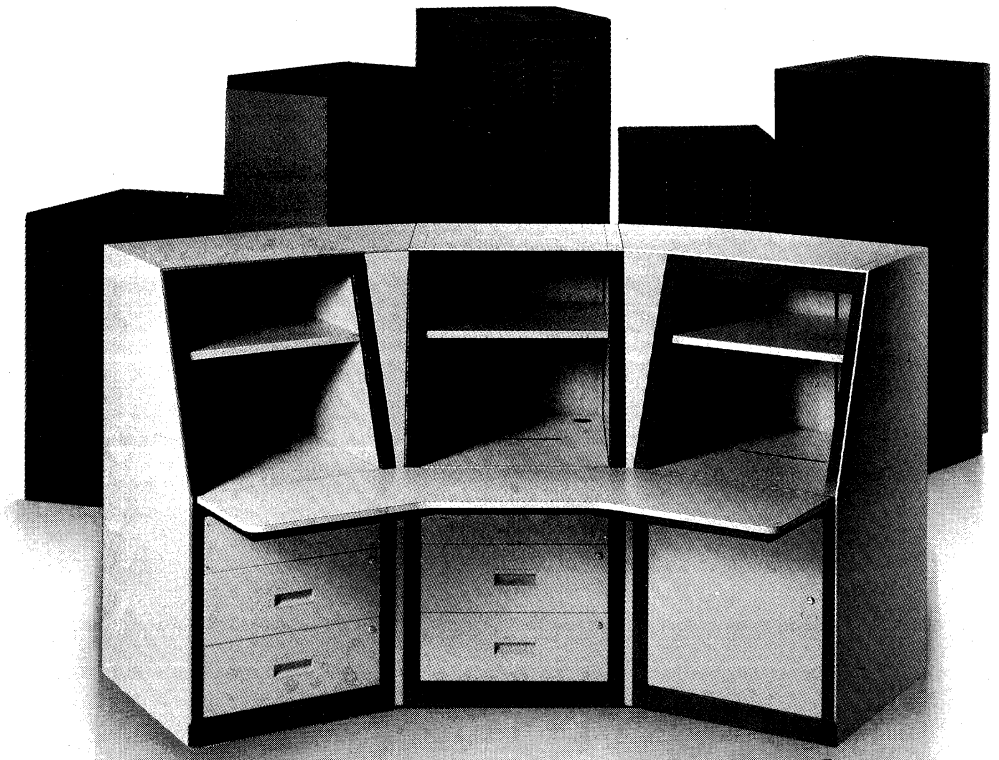
SPECIFICATIONS



WORK CENTERS • LAB SYSTEMS • SHELVING • STORAGE CABINETS • SEATING



Custom design value for off-the-shelf prices.

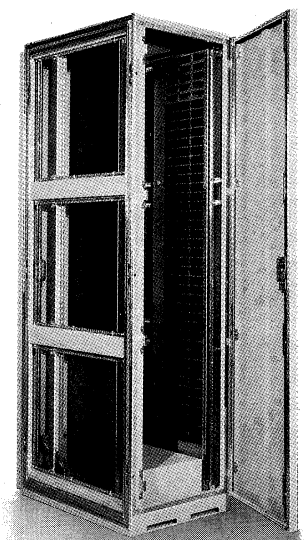
For thirty years Wyle Laboratories Electronic Enclosures has been designing electronic cabinetry specifically for the needs of each customer. And the cost has always been about the same as the off-the-shelf products other companies offer.

Today this kind of special attention is called "value engineering." For years we've just called it "giving the customer more for his money."

At Wyle Laboratories Electronic Enclosures, we still make the highest quality electronic equipment enclosures available. We provide more customized applications than any other manufacturer. Our standard product line is the industry standard. And we're known for quick response to customer requirements.

We also lead the industry in RFI/EMI shielding technology. We provide levels of shielding for FCC compliance to military and high security TEMPEST applications to give our customers cost effective solutions.

We've been putting value engineering into practice for 30 years. Let Wyle Laboratories Electronic Enclosures value engineer your next electronic enclosures solution.



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THE VALUE ENGINEERED ENCLOSURE LINE

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UNIT OF ZERO CORPORATION
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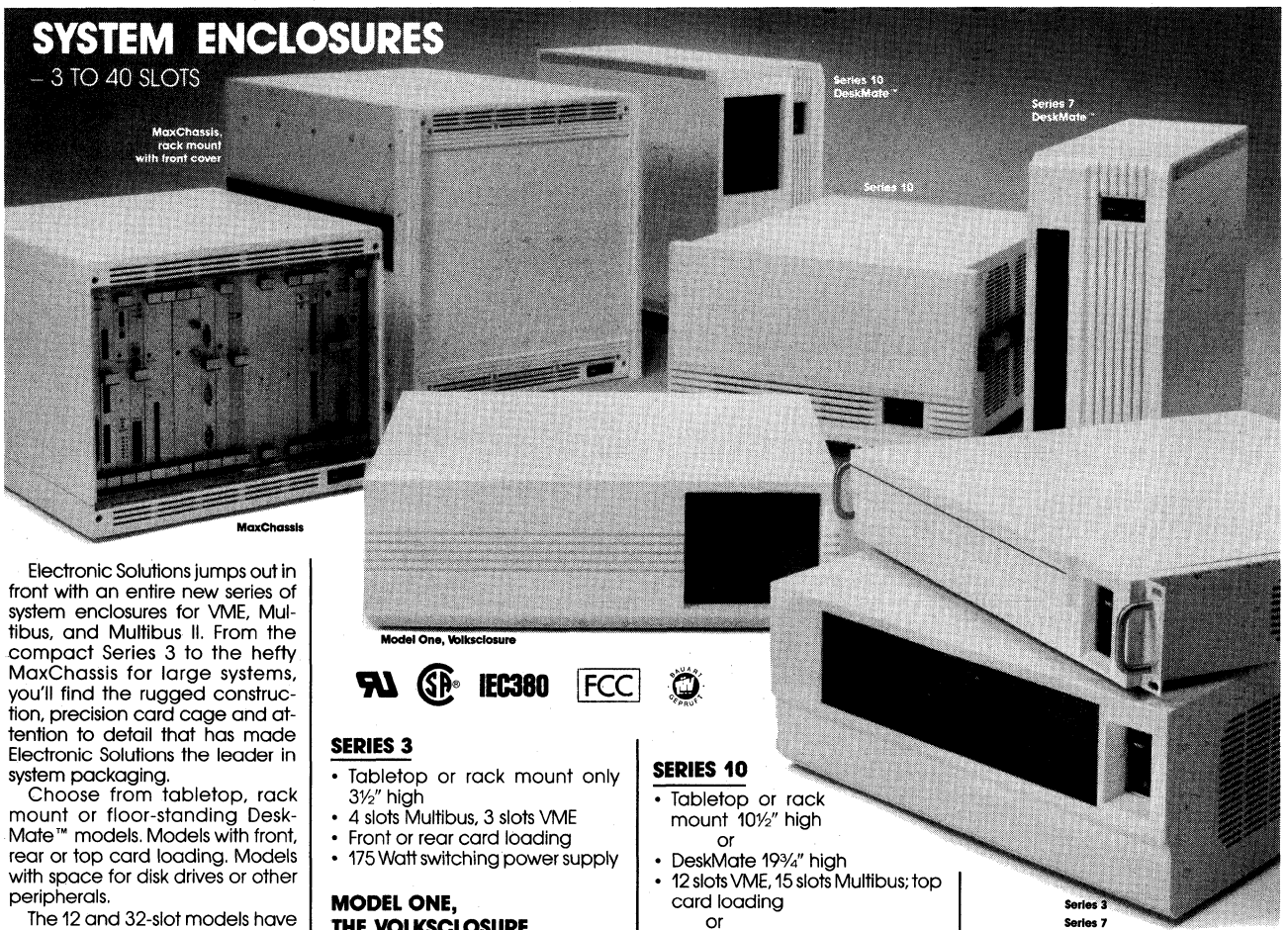
System Packaging for

SYSTEM ENCLOSURES
– 3 TO 40 SLOTS



Electronic Solutions jumps out in front with an entire new series of system enclosures for VME, Multibus, and Multibus II. From the compact Series 3 to the hefty MaxChassis for large systems, you'll find the rugged construction, precision card cage and attention to detail that has made Electronic Solutions the leader in system packaging.

Choose from tabletop, rack mount or floor-standing DeskMate™ models. Models with front, rear or top card loading. Models with space for disk drives or other peripherals.

The 12 and 32-slot models have modular mounting for up to four half-height peripherals. The 20-slot models have a choice of front or rear card mounting. The 32 and 40-slot models have two card cages, one front and one rear loading.

All have high-performance P1/J1 backplanes (with a choice of P2/J2 options) and efficient switching power supplies. And most are designed to meet FCC EMI/RFI, UL, CSA, IEC 380 and TUV/VDE standards—to make *your* job easier.

UL CSA IEC380 FCC

SERIES 3
- Tabletop or rack mount only 3½" high
- 4 slots Multibus, 3 slots VME
- Front or rear card loading
- 175 Watt switching power supply

MODEL ONE, THE VOLKSCLOSURE
- 6 slots VME or Multibus II
- 190W or 270W power supply
- Provision for 3 half-height peripherals
- P1/J1 and P2/J2 backplanes (VME with ext. addressing or iLBX II)
- Tabletop 7" high

SERIES 7
- Tabletop or rack mount 7" high
  or
- DeskMate 19¾" high
- With provision for 4 half-height or 2 full-height peripherals: 7 slots VME or Multibus II, 10 slots Multibus; rear card loading
- With provision for 2 half-height peripherals: 5 slots VME or Multibus II, 7 slots Multibus; front or rear card loading
- Without peripheral mounting: 7 slots VME or Multibus II, 10 slots Multibus; front or rear card loading
- 325 Watt switching power supply

SERIES 10
- Tabletop or rack mount 10½" high
  or
- DeskMate 19¾" high
- 12 slots VME, 15 slots Multibus; top card loading
  or
- 10 slots VME; rear card loading.
- Optional provision for 8 half-height or 4 full-height peripherals
- 325 or 500 Watt switching power supply

MAXCHASSIS
- Tabletop or rack mount
- 14" high (for 6U cards)
- 12, 20, 32 or 40 slots VME
- 12 or 20 slots Multibus II
- 400W, 600W or 800W power supplies
- Optional provision for 4 half-height or 2 full-height peripherals
- Models for 6U and 9U card heights
- Models for 100, 160, 220, 280, 340 and 400mm card depths (20 slots max for 280mm and up)

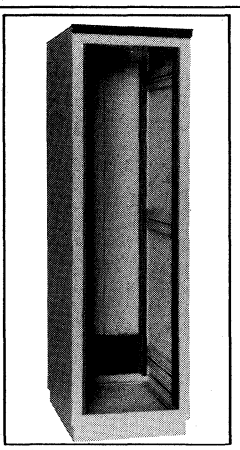
FAX THE FACTS

In a hurry? Got a FAX? We'll FAX details on Electronic Solutions products to you right now. Call our toll free number and let us know the product data you need, and your FAX information (dialing number, type of facsimile machine).

SYSTEM RACK CABINETS

MaxRack rack cabinets are attractive, strong, and economical—ideal for Multibus, VMEbus or Multibus II-based systems as well as other equipment designed for standard 19" rack mounting.

- 35" to 78¾" Panel Openings
- 30" Depth
- Front and Rear Door Options, including smoked plexi
- Connector Panel Options
- Mounting Rail and Buss Bar Options
- Trim Options
- Cooling Options



For more information call TOLL FREE
(800)854-7086 In Calif. **(800)772-7086**

VME, Multibus, Multibus II

Electronic Solutions
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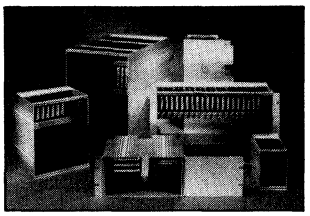
VME AND MULTIBUS II CARD CAGES - 3 to 21 SLOTS



Strong, rugged Electronic Solutions Eurocard VME and Multibus II cages are ideal for system development and OEM applications. It's easy to match OEM mounting configurations, since each card cage can be mounted on the bottom or any side. All include high-performance P1/J1 backplane and are available with a variety of P2/J2 options.

For VME, a unique center adapter can convert a double height (6U) slot into two single size (3U) slots (or a 9U slot into a 6U and a 3U), making it easy to configure systems with multiple slot sizes.

Order No. **V 80 3 - D N 160 T**

Backplane Type
V: VME Backplane. **M:** Multibus II Backplane.
E: EuroCage Frame Only (i.e. no Backplane).

Card Spacing (Ctr-to-Ctr)
80: 0.80" spacing.

Number of Slots
3, 5, 7, 9, 12, 16, 20, and **21.**

Card Height
S: 3U (Single High) **D:** 6U (Double High) **T:** 9U (Triple High)

Termination Position
N: On-board terminations (for 3, 5, 7, 9, 12, 16, & 20 slot backplanes).
F: Off-board terminations (plug-on terminations like those on the 21 slot backplane).

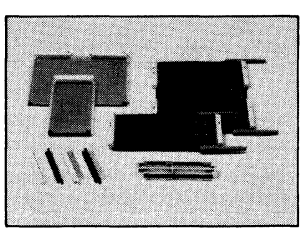
Card Depth
100: 100mm **220:** 220mm **340:** 340mm
160: 160mm **280:** 280mm **400:** 400mm

Mounting Configuration
T: Table Top (Surface mount).
H: Horizontal Rackmount.
V: Vertical Rackmount.

• Fans and fan mounting brackets are available for all Electronic Solutions card cages

VME & MULTIBUS PROTOTYPING AND EXTENDER CARDS

Electronic Solutions development cards have 0.1" hole spacing, I/O connectors, easy power and ground assignments with dedicated and undedicated bus strips.



VME:

VME-68HD	Prototyping board for up to 120 16-pin DIP packages in 6U version
VME-68HS	Prototyping board for 48 packages in 3U version
VME-2101-01	Wire wrap board (6U) with universal pattern, for up to 120 16-pin ICs
VME-2102-01	Wire wrap board (6U) with 22x52 pin PGA pattern plus universal pattern
VME-2100-01	Wire wrap board (6U) with 20-pin DIL plus universal pattern
VME-68ED	6U Extender Card
VME-68ES	3U Extender Card

MULTIBUS I:

PR-100H	Prototyping board for up to 1-50 16-pin DIP packages
PR-100A	Prototyping board with interface circuitry, plus up to 75 16-pin DIP packages
PR-100WP2	Wire wrap board for up to 75
PR-100WP3	16-pin DIP packages. Two- or Three-level wire wrap.
80EX-3	Extender card

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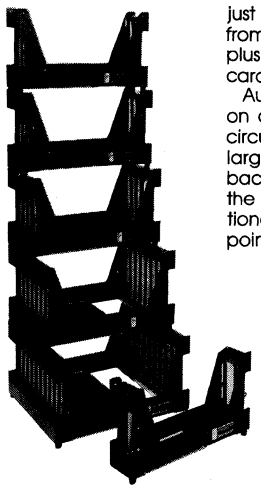
MULTI-CAGE™ CARD CAGES FOR MULTIBUS I



These rugged, durable anodized aluminum card cages are available with just the right capacity for your needs—from 3 slots to 26 slots, 0.6" or 0.75" spacing, plus accommodation for iSBX or wirewrap cards.

Auxiliary (P2) backplanes are available on all models. Parallel priority resolution circuitry (PPRC) is available on 8-slot and larger cages. All have multiple backplane power supply terminals, and the 21-slot and larger cages have an optional power distribution board for single point, high current power connections.

Models with .6 inch Card Centers

Model	No. of Slots	No. of iSBX slots available*	No. of w-w slots available*	Depth (in.)
ESBC 604	4	0	1	3.34
SBC 604A	4	1	0	3.34
ESBC 614G	4	0	1	3.34
SBC 605	5	0	1	3.94
SBC 606	6	0	1	4.54
SBC 608	8	2	2	6.68
SBC 609	9	1	1	6.68
SBC 619	9	0	1	6.68
SBC 6010	10	0	0	6.68
SBC 6012	12	3	4	10.02
SBC 6012B	12	0	1	8.04
SBC 6013B	13	0	1	8.69
SBC 6014	14	1	2	10.02
SBC 6015	15	0	1	10.02
SBC 6016	16	5	5	13.36
SBC 6020	20	1	1	13.36
SBC 6024	24	2	3	16.7
SBC 6026	26	0	1	16.7

Models with .75 inch Card Centers

Model	No. of Slots:	No. of iSBX slots available*	No. of w-w slots available*	Depth (in.)
SBC 753	3	0	1	3.34
SBC 754	4	0	1	3.94
SBC 755	5	0	1	4.54
SBC 757	7	1	1	6.68
SBC 7512	12	0	1	10.02
SBC 7516	16	1	1	13.36
SBC 7521	21	0	1	16.7

HORIZONTAL RACK MOUNT

Models with .6 inch Card Centers

Model	No. of Slots	No. of iSBX slots available*	No. of w-w slots available*	Rack Space
ESBC 604H	4	0	1	3.5
SBC 604AH	4	1	0	3.5
SBC 605H	5	0	1	5.25
SBC 606H	6	0	1	5.25
SBC 608H	8	2	2	7.0
SBC 609H	9	1	1	7.0
SBC 6010	10	0	0	7.0
SBC 6012H	12	3	4	10.47
SBC 6014H	14	1	2	10.47
SBC 6015H	15	0	1	10.47

Models with .75 inch Card Centers

Model	No. of Slots	No. of iSBX slots available*	No. of w-w slots available*	Vertical Rack Space
SBC 753H	3	0	1	3.5
SBC 754H	4	0	1	5.25
SBC 755H	5	0	1	5.25
SBC 757H	7	1	1	7.0
SBC 7512H	12	0	1	10.47

VERTICAL RACK MOUNT

Vertical rack space for all models 15-3/4'

Models with .6 inch Card Centers

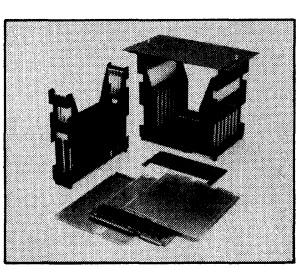
Model	No. of Slots	No. of iSBX slots available*	No. of w-w slots available*
SBC 6012V	12	4	4
SBC 6014V	14	2	2
SBC 6015V	15	1	1
SBC 6016V	16	5	5
SBC 6020V	20	1	1
SBC 6024V	24	3	3
SBC 6026V	26	0	1

Models with .75 inch Card Centers

Model	No. of Slots	No. of iSBX slots available*	No. of w-w slots available*
SBC 7512V	12	0	1
SBC 7516V	16	1	1
SBC 7521V	21	0	1

*Without using additional slots.

DOUBLE HEIGHT MULTIBUS I



The Electronic Solutions 2X Multibus system uses 12 x 12" cards, offering double the useful circuit area of a standard size card. Or even more than double, considering the bus interface "overhead" on each card.

All Multibus I card cages, prototyping and extender cards are available in double height versions. Add "2X" before model number.

Electronic Solutions
UNIT OF ZERO CORPORATION

Board Level System Packaging

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Electronic Solutions has card cages for every application. From five basic parts—card guides, mounting bars, spacers, mounting feet and end plates—thousands of possible combinations can be assembled.

All items can be color coded (12 colors) and/or hot ID stamped by Electronic Solutions. Ask for the Electronic Solutions Card Cage Component Catalog.

CARD GUIDES: The patented Scanbe "T" Series guides have integral connector mounting feet or are available as Thru-Guides for separate connector mounting components. Lengths 2.750" to 12.815". Also Snap-In Guides 2.500" to 12.000".

CONNECTOR MOUNTING: Thru-hole or with 4-40 threaded brass or stainless steel inserts. Available as "A" Series nylon mounting feet that slide on mounting bars, or as a connector mounting bar for high insertion force connectors.

MOUNTING BARS: For "T" Series guides and "A" Series mounting feet, up to 24" length, for single and multiple card rows. For Snap-In guides mounting bars are pre-punched with .5, .6, .7 or .75" centers. 17" length standard, but can be cut to length.

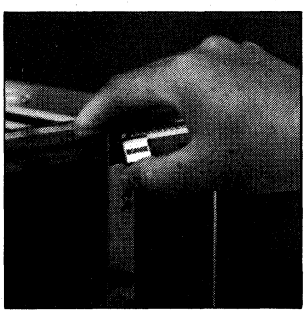
SPACERS: Adjust the nominal .500" width of "T" Series card guides to your card spacing. Spacers 0.031" to 1.000" for card spacing 0.531" to 1.500".

END PLATES: Mate with mounting bars and provide ears for rack or panel mounting. Heights 5.22 to 17.47", depths 8.25" to 11.25".

CUSTOM CARD CAGES

Electronic Solutions can custom tailor a card cage to your specifications. Just call our toll-free 800 number and ask for an Applications Engineer.

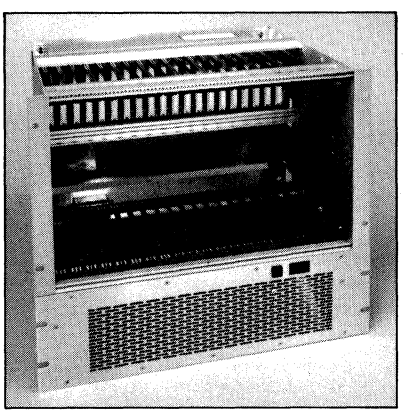
E-Z-JECT™ VME EJECTORS and PANELS



The Scanbe E-Z-Ject™ has become the industry standard ejector for VME bus boards, providing a quick and easy method of removal from Eurocard format card cages. The standard E-Z-Ject front panel assembly includes the front panel, the handle(s), and the corresponding hardware. Custom panel labeling as well as custom ID panels for E-Z-Ject handles are readily available.

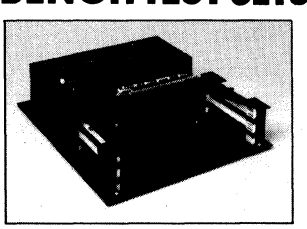
Size	Order No. Unassembled	Assembled
3U x 4HP	32025	32005
6U x 4HP (lower bracket)	32030	32010
6U x 4 HP (upper bracket)	32028	32027
6U x 8HP (std.)	32094	32091
6U x 8HP (Wire wrap)	32152	32011
9U x 4HP	32035	32014
9U x 8HP (wire wrap)	32153	32128
9U x 8HP (deep comp.)	32226	32186

VME AND MULTIBUS II POWER CAGES



Here's the convenience of an enclosure with the easy access of a test set, in a compact, rack mount package. The power cage combines a rack mount VME or Multibus II card cage, a 400W or 600W power supply and triple fan cooling. It's fully wired and ready to go, but takes up only 3½" more rack space than the cage alone. 20 or 21 slots VME; 20 slots Multibus II. Or 12 slots plus up to 4 half-height peripherals. 3U, 6U or 9U card heights; 160mm, 220mm or 400mm card depths.

BENCH TEST SETS



Get your board-level system up and running with a minimum of cost and effort. Use this fully wired combination card cage and 125 Watt power supply.

VME: TS-80x
x = 5, 7 or 9 slots
Multibus: TS-60x
x = 4, 5, 6, 8 or 9 slots

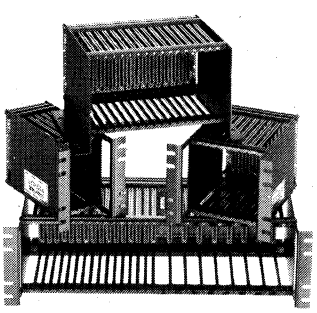
All Electronic Solutions enclosures, cards and card cages

THREE YEAR 3 LIMITED WARRANTY

STD BUS CARD CAGES

Electronic Solutions STD Bus Card Cages are complete with card guides and mounting flanges, and come with a choice of STD backplane, wire wrap connectors, or without connections for user installation.

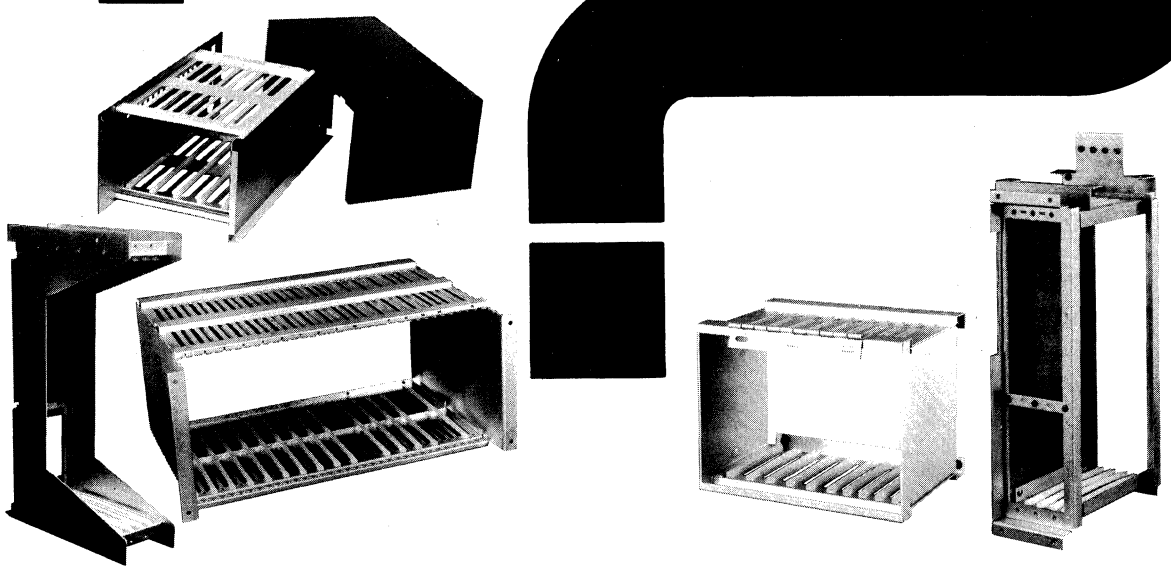
- 4, 8, 16, 24 or 32 Slots
- .5, .75, or 1.0" Card Spacing, and Combinations
- Rack Mount or Tabletop



For more information call TOLL FREE
(800)854-7086 In Calif. **(800)772-7086**

THE CARD ENCLOSURE QUIZ
Does your supplier measure up?

- ☐ **FREE Value Analysis service.**
- ☐ **Competitive pricing for maximum cost effectiveness.**
- ☐ **Complete in-house manufacturing and finishing.**
- ☐ **Consistent high quality and on-time delivery.**
- ESF **ALL OF THE ABOVE**



ESF, America's card enclosure specialists, has the people, products and services to best fill your card enclosure needs. Starting with our Free Value Analysis, we work with you to provide a stronger, more cost effective rack design. This team effort continues through engineering into production and testing.

Just send us a sketch, print or sample of your present card rack. Whether you need 50 or 5000, our engineers can show you the first step to improved card enclosure design at lower unit cost.

The Engineers' Design Manual is a compilation of the latest technology and most commonly asked questions concerning card enclosure design. Send for your FREE copy.

ESF
Electro-Space Fabricators, Inc.
West High Street • Topton, PA 19562
(215) 682-7181

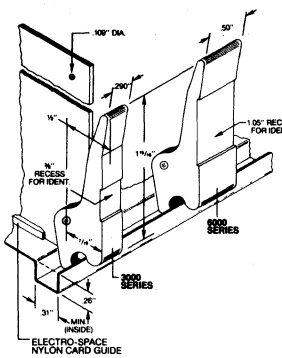
Custom VME and Multibus II card enclosure designs also available.

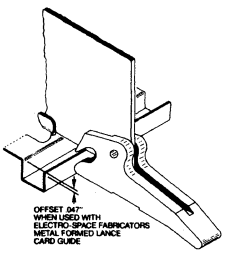
Electro-Space Fabricators, Inc.

Packaging Accessories

Injector/Ejectors

Unique devices function in two directions...utilizing both surfaces of a single blade. Design eliminates the need for very close tolerances. The front of PC card should be flush with front of guide plate to insure proper insertion and extraction of card.





Part No.	Card Size	Color	Material
NE-3001-W 1-B	1/16" 1/16"	White Black	Type 66 Nylon ASTM D4066 PA111 U.L. 94V-2
NE-3003-W 3-B	1/8" 1/8"	White Black	
NE-3001-NGV 3001-BGV	1/16" 1/16"	Natural (Tan) Black	30% Glass Filled Type 66 Nylon ASTM D4066 PA100 G32 F24 U.L. 94V-0
NE-6001-NGV NE-6001-BGV	1/16" 1/16"	Natural (Tan) Black	

6000 series also features

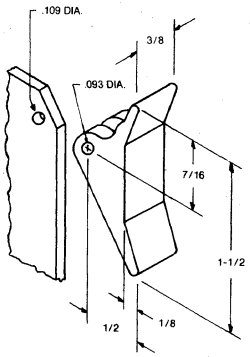
- Bar code recessed identification area for industry standard labeling
- Extra width delivers extra strength for large cards requiring greater insertion/extraction forces
- Flame retardant applications... molded of 30% glass filled nylon UL 94V-0 material.

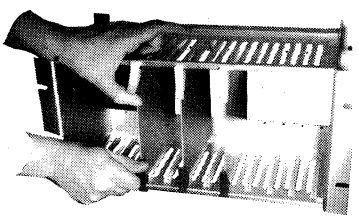
Notes:

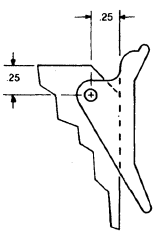
1. Includes stainless steel press-fit mounting pin
2. Special colors available

Ejectors

Improved lever action and greater strength for quick, damage-free extraction. The front of PC card should be flush with front of guide plate to insure proper extraction of card.







Part No.	Card	Slot	Color*
EJ-2001-W EJ-2001-R	1/16"	.072	White Red
EJ-2003-W EJ-2003-R	1/8"	.135	White Red

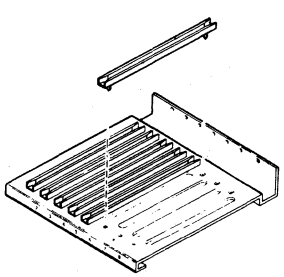
Notes:

1. Includes stainless steel mounting pin
2. Type 66 Nylon ASTM D4066 PA 111 U.L. 94V-2
3. Special colors available

Nylon Guides

Smooth, effortless slide for board insertion; unique bow feature.

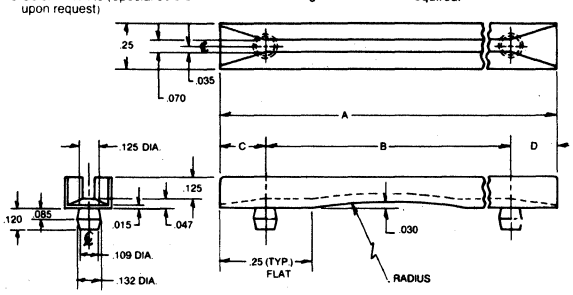
A-42870	A	B	C	D	MATERIAL
-1W	4.00	3.50	.25	.25	White Type 66 Nylon ASTM D4066 PA111 U.L. 94V-2
-2W	6.00	5.50	.25	.25	
-3W	8.50	8.00	.25	.25	
-4W	3.00	2.50	.25	.25	
-1BV	4.00	3.50	.25	.25	Black Nylon Flame Retardant U.L. 94V-0
-2BV	6.00	5.50	.25	.25	
-3BV	8.50	8.00	.25	.25	
-4BV	3.00	2.50	.25	.25	
-5BV	5.00	3.50	.75	.75	
-9BV	9.00	8.00	.75	.25	



NOTE:
1. 1/64 Radius — All edges except bottom of guide and inside of .070 slot.
2. 20V Nylon MIL-M-20693A, composition A, Type I. Temp. Rating: – 40°C to + 105°C. UL Approved.
3. Color — White (Special colors upon request)

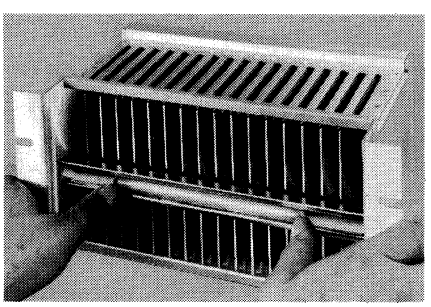
MOUNTING HOLES:
.125 dia. hole (front)
.120 x .218 slot (rear);
material range .048 to .080

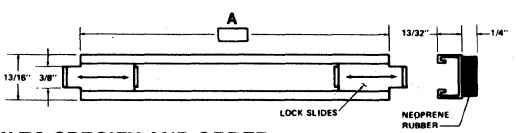
INSTALLATION:
Sharp impact, snap-in.
No special tools or hardware required.



Retaining Bars

Quick, low cost solution for PC board retention and shipping problems.





HOW TO SPECIFY AND ORDER:

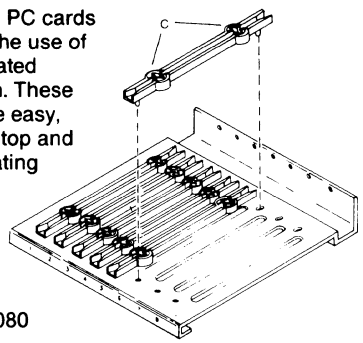
1. Deduct 1/8" from the inside dimension of your PC card enclosure. This is the "A" dimension shown above.
2. Develop part number by expressing the "A" dimension in three-place decimal form and writing it after the prefix RB-_____. (Example: A=16 7/8".) Part number is RB-16875.
3. Use this part number in ordering. Specify clear or yellow zinc plate.
4. Two .125 dia. plating holes left and right slide areas centered 1/2" from both ends.

Electro-Space Fabricators, Inc.

Accessories, Tempest, Injection Molding

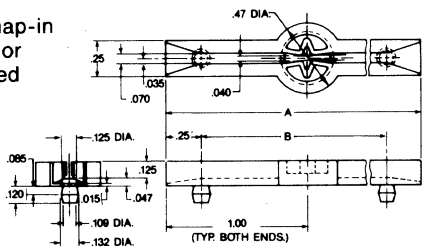
Anti-Vibration Nylon Guides

Unique design prevents PC cards from vibrating through the use of two or more buffers located along the guides' length. These low-cost guides provide easy, snap-in insertion at the top and bottom of cards, eliminating the need for special tools and hardware.



MOUNTING HOLES:
.125 dia. hole (front)
.120 x .218 slot (rear)
Material range .048 to .080

INSTALLATION:
Sharp impact, snap-in
No special tools or hardware required

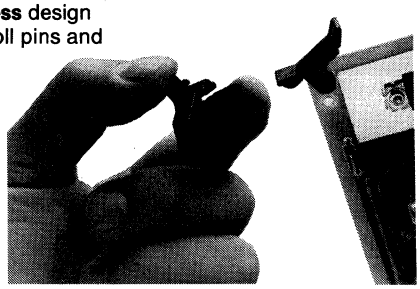


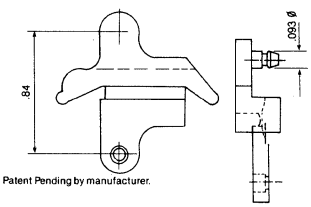
V-82883	A	B	C (# of Buffers)
-1W	4.00	3.50	2
-2W	6.00	5.50	3

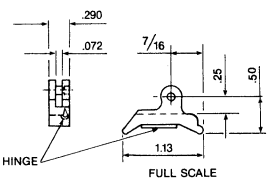
Notes:
1. Type 66 Nylon ASTM D4066 PA 111 U.L. 94V-2
2. Type 2 has an additional buffer at center of guide length
3. Color white — special colors available

Printed Circuit "Butterfly"-Design Card Ejector

Offer improved lever action and greater strength for fast, efficient removal. The **pinless** design eliminates metal roll pins and does not require special setup time for installation. The front of PC card should be flush with front of guide plate to insure proper extraction of card.





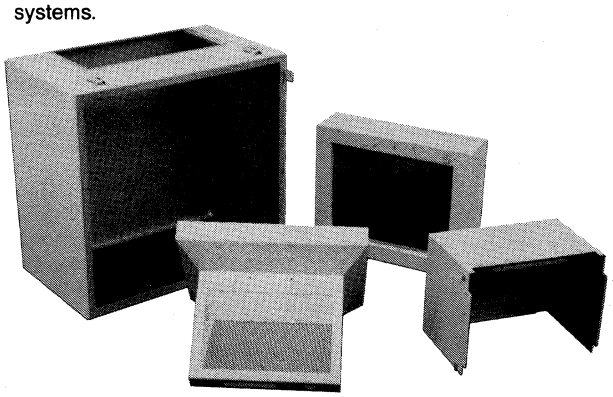


Part No.	Card	Slot	Color
BF-3632-W	1/16"	.072	White
BF-3632-B	1/16"	.072	Black

Notes:
1. .250 x 45 notch required on printed circuit card
2. Type 66 Nylon ASTM D4066 PA 111 U.L. 94V-2
3. Special colors available

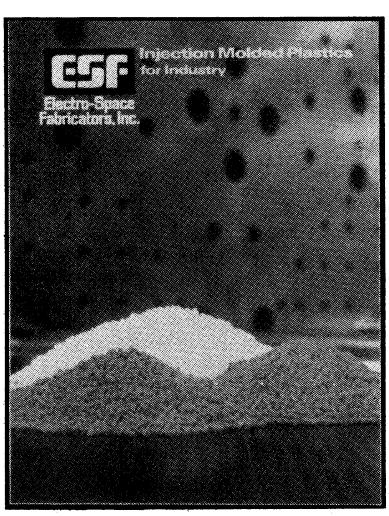
TEMPEST Weldments

ESF is an experienced manufacturer of completely sealed units which meet stringent test requirements in welding, painting, masking and gasket surface flatness. For best tempest design, CAD/CAM/CAE and value analysis are available for your current or proposed systems.



Plastic Injection Molding

ESF's high-tech, high performance injection-molding machines are computer-controlled for fast-cycle molding capabilities and close dimensional tolerances necessary for the highest part-to-part reproducibility. Our plastic technology extends into machining, ultrasonic welding and hardware insertion, EMI/RFI shielding, painting, hot stamping and silkscreening.



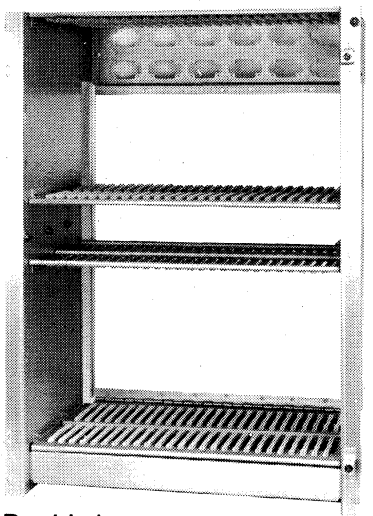
Write or call for our free Injection Molded Plastics brochure.

Electro-Space Fabricators, Inc.

FREE Value Analysis of Your Enclosure

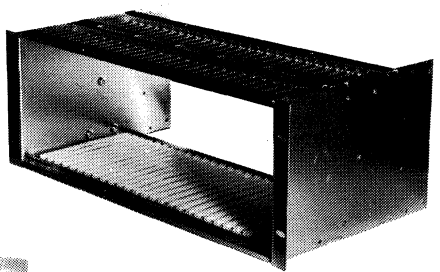
Improved card rack design begins with in-depth value analysis. And that's a free service of the ELECTRO-SPACE design group...aimed at delivering greater strength and better tolerances at lower unit cost. Our packaging techniques place no limitations on size, card spacing, special holes and hardware, connector or back plane mounting.

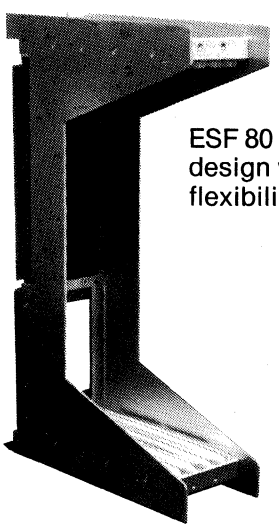
If your rack requirements are 50 or 100, 500 or 5000, why not draw upon our expertise? Our present customers have done so and enjoyed significant savings, both in unit cost and on their production lines. Send us your sketches, prints or sample rack at no obligation. Or, call and ask for one of our qualified design engineers.



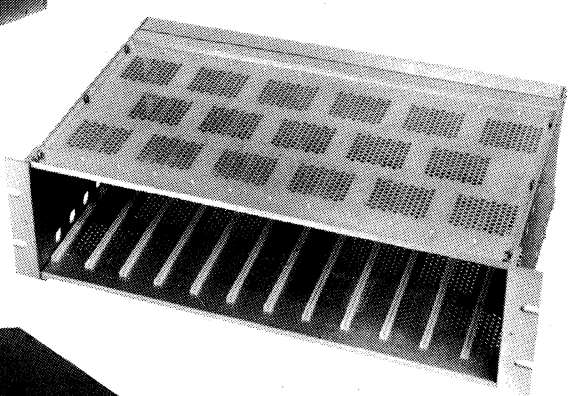
Double bay enclosure with fan mounting tray.

Stiffening hat section for greater strength.

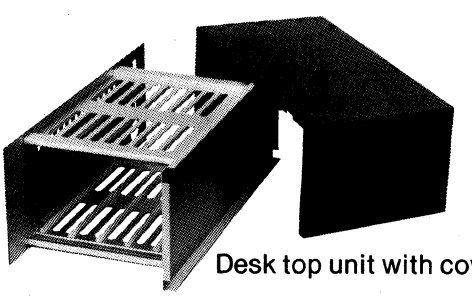




ESF 80 standard rack design with low cost flexibility.



Perforated guide plate with RF shielding.



Desk top unit with cover.

The Engineers' Design Manual is a compilation of the latest technology and most commonly asked questions concerning card enclosure design. Send for your free copy today.

Electro-Space Fabricators, Inc.

300 W. High St.•P.O. Box 67•Topton, PA 19562-0067
(215) 682-7181

Altech Corp.
349 ROUTE 206 SOUTH, SOMERVILLE, N.J. 08876
TELEPHONE: (201) 359-4454 FAX 201-359-8178

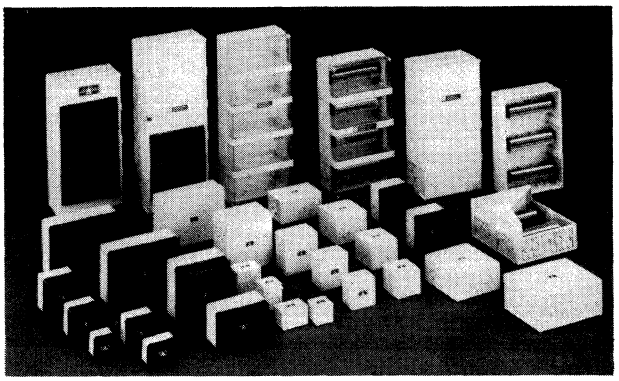
PROTECT, SECURE, AND INSULATE...

your sensitive electronic, instrument, and electrical components with Altech's non-metallic enclosures. They are:

- Dustproof
- Moistureproof
- Non-Corroding
- Chemical and Impact Resistant

Our Enclosures Are:

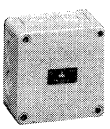
- Fully Gasketed with Polyurethane Seals
- Precision Molded Polystyrene, Polycarbonate, or Glass Reinforced Polycarbonate
- Available with Transparent, Gray and Hinged Covers
- Furnished Empty or with Accessories
- Available in a Full Range of Standard Sizes
- Sealed Using Plastic Retaining Screws
- Available in Designs Meeting NEMA 4X
- Complete with (2) Mounting Options
- Available with Custom Sidewall and Base Configurations
- Offered in Special Colors Upon Request
- Supplied with Normal or High Covers



Altech's Family of Spelsberg Enclosures Include the TK, AK, EK, HP, WK, Nautic, RK, LK, ZK, LTK Series for All Your Application Requirements.

TK Series with Transparent, Normal Height Cover

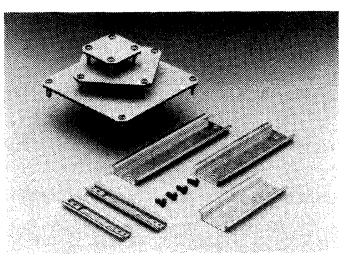
TK Series with Gray, Hinged, Normal Height Cover



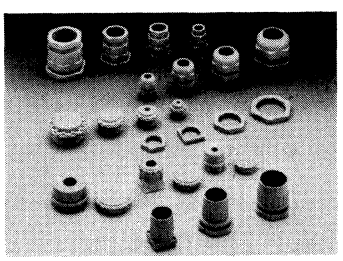
TK Series with Gray, Normal Height Cover

TK Series with Gray, Normal Height Cover Showing Standard Polyurethane Seal

Enclosure Accessories Include:



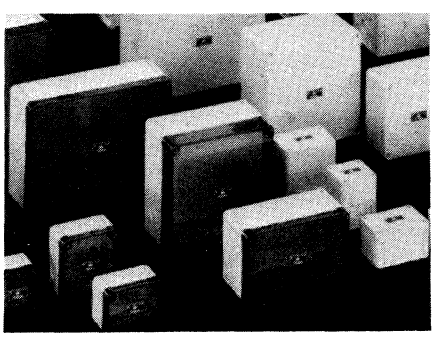
- Mounting Plates and Hardware
- DIN Mounting Rails
- Terminal Blocks and Assemblies



- Fittings for IP 54 or IP68 Protection
- Cover Hinges
- Twist Sleeves and Cable Glands in PG or NPT Sizes
- Tools for Knockouts

AK Series

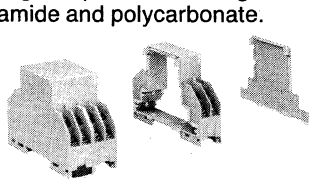
Modular Design with Hinged, Transparent Door for Increased Visability and Quick Access



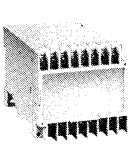
TK Series

Offered in (8) Standard Sizes and (4) Cover Configurations

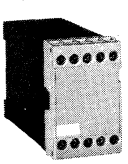
Also, Altech/Dold DIN Rail mountable and front-panel type electronic enclosures. Take advantage of the DIN concept offering compact sizes, integrated terminal strips, printed circuit board guides and connectors. UL 94-VO materials, polyamide and polycarbonate.



KU 4086 Series for high density packaging. Only 0.68 inches wide, DIN-rail or base mount. Expandable with add-on modules. PCB slide-in guides, 11 different configurations. Other options available.



K70/32.5 thru 150 Series with easy access cover and finger proof, terminal protection. Several PCB's can be inserted for compact design. DIN-rail or base mount. Custom art-work and machining are available.



KO 4000 Series with cost saving connection features and integrated terminal modules, up to 84 poles. Easy mount DIN-rail design. Multi-ple, PCB guides and connectors for slide-in or solder-in requirements.

SEE OUR TERMINAL BLOCKS IN SECTION 2100 C-1151-55 / SEE OUR SWITCHES IN SECTION 4500 B•1421 / SEE OUR RELAYS IN SECTION 5100 B•1677

ELMA

25 JAHRE ANNEE YEARS ELMA Electronic

Elma's Modular Enclosures

ELMA Electronic Inc.
A Member Of The Sulzer Group, 41440 Christy Street, Fremont, CA 94538 • (415) 656-3400

All ELMA products are available off-the-shelf and REASONABLY PRICED

General Information

ELMA enclosures are designed for ease of assembly, versatility, and durability. Their modular design offers virtually unlimited electronic packaging flexibility. Standard Eurocard (100 x 160 mm, 3.94 x 6.30 in.) and card sizes derived therefrom are easily accommodated. Compatible to VMEbus and MULTIBUS II board formats. With internal subdivisions, any card size can be used. In addition, all edge connectors currently in use can be fitted using supplementary assembly sections.

Material

Aluminum extrusions form the framework of all these **ELMA** cabinets. Front and rear panels are 2½ mm clear anodized aluminum sheets. Cover panels are either 1.5 mm colored, vinyl coated aluminum sheet (models 14, 32, 36) or 3 mm colored, vinyl coated alucobond (two sheets of aluminum separated by a polyethylene core).

Accessories and Colors

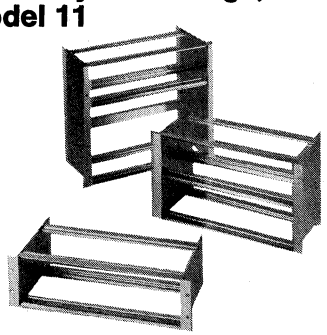
Front and rear panels are accessories on all models except 36, for which rear panels are included. Hinged and folding front panels may also be obtained in a variety of sizes for some models. Extruded front panels in various heights and widths can be used for plug-in modules. Aluminum handles are also available.

Cover panels are included on models 32 and 36. Standard colors are neutral umbra-brown, and blue (model 36). Graphite black, brilliant blue, and gray cover panels are available on special order. Perforated top and bottom panels may also be obtained.

Dimensional Units
1U = 1.75″, 1T (HP) = 0.20″

The overall height of modules, card frames and plug-in cases and the acceptance height of cabinets is based on height units (U) per DIN Standard 41494. One U equals 1¾″ or 44.45 mm. The 5.08 mm (2/10″) horizontal pitch unit T is used for the acceptance width. The 19-inch insert width (483 mm) of the 19″ floor cabinet corresponds to the overall width of 19″ modules, 19″ card frames, 19″ cases and the 19″ cabinet front panels.

Economy Card Cage, Model 11



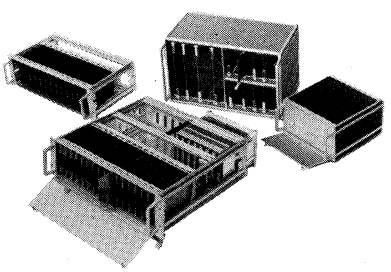
Application: The Model 11 is designed to accommodate single (3u), double (6u), and triple high (9u) Eurocards with depths of 160 mm, 220 mm, 280 mm, 340 mm and 400 mm. It can also accept card heights of 4.4″, 4.5″ and 9.65″. It is fully compatible to VMEbus, MULTIBUS II and Sun Systems.

Heights: 5.25″, 10.50″, 15.75″.

Widths installed: 8.4″, 16.8″.

Depths installed: 8.50″, 10.87″, 13.23″, 15.61″, 17.98″.

19-Inch Universal Enclosure, Model 14



Application: The extruded aluminum frame can be used as a desktop case on a subrack for mounting in to 19″ cabinets. It is possible to rack mount type 14 with cover plates.

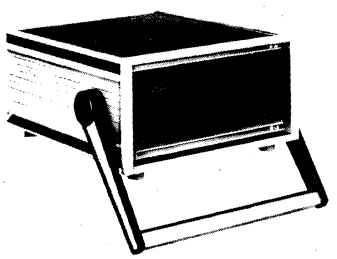
Accepts card sizes of 3u, 6u, 9u, 4.4″, 4.5″, 9.65″ and card depths of up to 400 mm.

Heights: 3.50″, 5.25″, 7.00″, 8.75″, 10.50″, 15.75″.

Widths installed: 8.4″, 12.6″, 16.2″, 16.8″.

Depths installed: 9.17″, 11.53″ 16.25″, 21″.

DIN Instrument Case, Model 36 (also panel-mount)



Features: front panel recessed by 10.5 mm (.41″).

Application: for control and regulating instruments, switches, etc. Panel mounting and tabletop case, available with angled feet; case dimensions and recess in accordance with standard governing built-in switchboard appliances (DIN standard 43 700).

Useable depths: 4.62″, 5.27″, 6.98″, 7.63″, 9.34″, 9.99″, 11.70″, 12.35″.

Heights: 2.84″, 3.78″, 5.59″.

Widths: 3.78″, 5.67″, 7.56″, 11.34″, 15.12″, 17.01″.

See VME Bus, Multibus products in section 2025 (Computers—Mini/Micro), section 2400 (Panel Hardware-Bezels, Dials, Knobs, etc.) and section 5100 (Switches) for additional ELMA products!

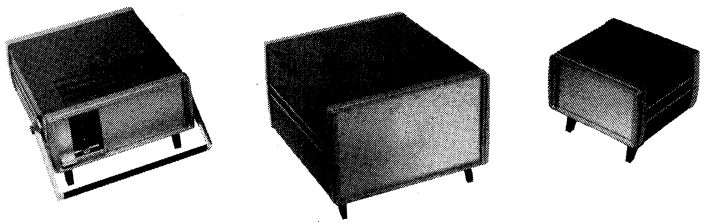
Packaging Enclosure Systems

ELMA Electronic Inc.

A Member Of The Sulzer Group, 41440 Christy Street, Fremont, CA 94538 • (415) 656-3400

All ELMA products are available off-the-shelf and REASONABLY PRICED

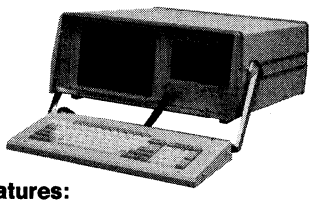
Desk Top Case, Model 32 Easy Assembly and Maintenance



Two sectional supports running full depth carry all inserts. These special supports permit versatile mounting with only simple assembly gear. The actual enclosure, which consists of front and rear frames and a top and base plate, has no supporting function. These parts are mounted on the mentioned supports using only four screws after the components have been inserted, wired-up and functional tests carried out. Therefore, no damage can be done to the cover plates during assembly. The cover plates are of scratch-resistant Sinaplast and are available in neutral umbra-brown. Unfinished aluminum plates for customer painting can also be furnished.

Heights: 5.25″, 10.50″, 3.50″, 7.00″.
Widths: 8.43″, 12.62″, 16.82″.
Depths: 9.02″, 12.17″, 15.31″, 18.46″.
Optional handles, front covers and component mounting chassis available.

Portable Detached Keyboard Unit Model 32

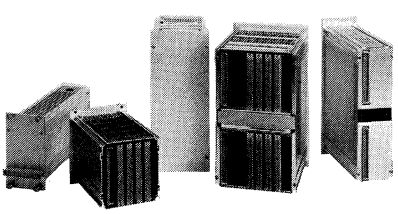


Features:
- Optimal flexibility
- Easy removal of keyboard from case
- Designed for numerous applications
- Sturdy construction for rugged field service use
- Accepts mountings per DIN 41494
- Mounting kits for 9″ CRT monitors available
- Standard or custom front panel design
- Accepts standard PC, PC-XT, PC-AT keyboards

Cabinets Model 48

Various models and colors available
Height: 3, 4, 5, 6, 9, 10, 12, 14, 15, 20, 26, 32, 36, 39, 41, 46 U.
Acceptance Depth: 235, 289, 355, 379, 469, 470, 475, 495, 600, 670 mm.
Total Width: 505, 545, 548, 559, 600 mm.
Accessories: Telescoping rails, castors, bases, leveling feet, lifting eyes, grounding sets, slide/guide rails, coupling sets, drawers, pull-out trays, top covers with fan, slide-in fan trays, sealing kits, etc.

Cassettes and Modules Model 23



Equipment: with cover plates, bottom and cover plate perforated.

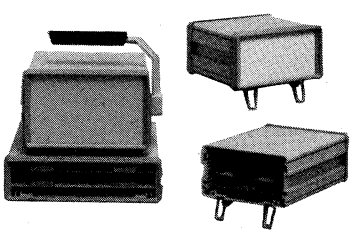
Application: to house printed circuit cards and components.

Heights: 5.25″, 10.50″.

Widths: 1.4″, 2.0″, 2.8″, 4.2″, 5.6″, 8.4″.

For card depths: 6.30″, 8.66″.

Ruggedized Case Model 33



This all aluminum instrument case consists of U-shaped extrusion which defines the width and height of the case. As the whole case is an extrusion, this compact case is highly stable and rugged. Mounting grooves in the bottom and on the sides allow parts to be mounted directly, without any extra hardware. The sealed aluminum construction guarantees good screening, shielding and meets class IP54/NEMA standards.

Frames to accept various board sizes (incl. VME and Multibus II boards) as well as different chassis for component mountings are available.

Heights: 2.72″, 3.37″, 4.06″

Widths: 6.12″, 8.27″, 10.10″

Depths: 5.67″, 8.03″, 10.39″, 12.76″

See section 2025 (Computers-Mini/Micro), section 2400 (Panel Hardware-Bezels, Dials, Knobs, etc.) and section 5100 (Switches) for additional ELMA products!

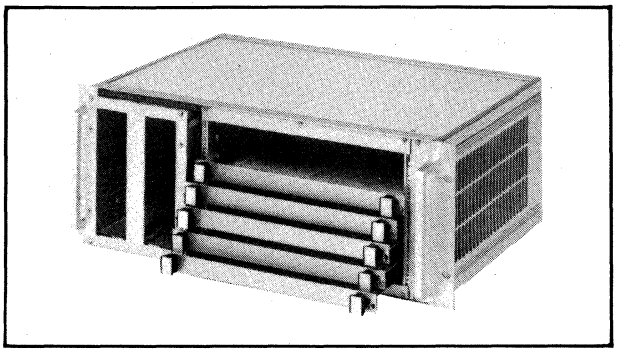
ELMA Electronic Inc.
41440 Christy Street • Fremont, CA 94538 • Phone: 415-656-3400 • FAX: 415-656-3783

MODULAR SYSTEM ENCLOSURE

Consistent High Quality For Over 25 Years

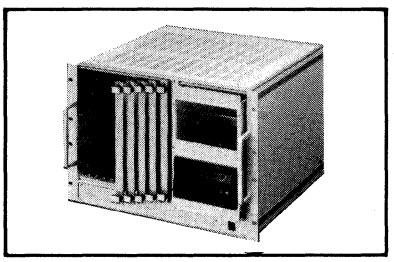
ELMA Electronic, founded in 1962 near Zurich, Switzerland, has become a world wide leader in electronic enclosures and components, with facilities or representation in 22 countries. ELMA is a member of the Sulzer Group which has annual sales of over 4 billion dollars and over 33,000 employees. ELMA systems are designed to meet the highest standards of precision and dependability. This product line offers both standard and custom solutions for a wide variety of bus standards including **VME, VXI, SUNbus, Multibus II, PC, AMS, SMP, Future bus** and many more. In addition, ELMA system enclosures are designed to meet most of the international standards including UL, CSA, TUV, FCC, VDE and IEC. ELMA's unique modular approach satisfies a wide range of applications with off-the-shelf parts, eliminating expensive and time consuming custom work. ELMA covers your requirements, starting from individual components up to fully wired and tested 'ready-to-run' systems.

SYSTEM 14

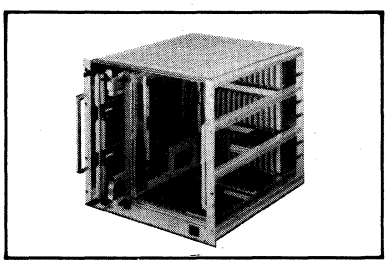


System 14 (Universal) enclosures feature extrusion construction with scratch-resistant top and bottom cover plates. They are available in rack-mount and desktop configurations from 1U to 12U in height and from 9 to 26″ deep. Boards can easily be recessed in this model. Designed to accept VME, VXI, Multibus II, SUNbus and PCbus boards.

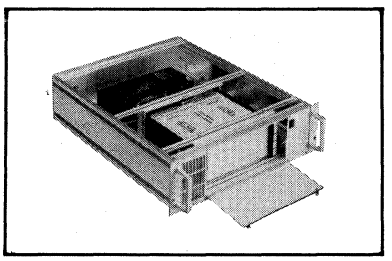
Suitable for desktop or rack mount applications, the system is completely wired and tested with 7 slot P1 and P2 backplanes. Includes 250 watt switching power supply. Accommodates two 5¼″ drives.



7U × up to 21-slot VME compatible system features 1U fan tray with three fans to insure proper cooling. Suitable for desktop and rack mount applications. Accommodates various drive module combinations. Includes power supply from 300 to 1000 watts.

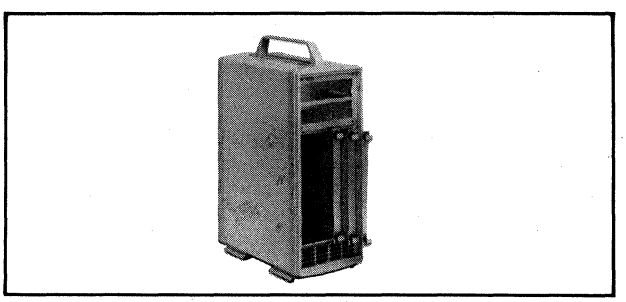


This 10U SUN system is capable of handling 21 boards of 9U × 400mm or combinations of 3U and 6U high boards in depths of 100 to 400 mm. 1U fan tray with 9 fans insures proper cooling. Designed for rack mount or desktop use.



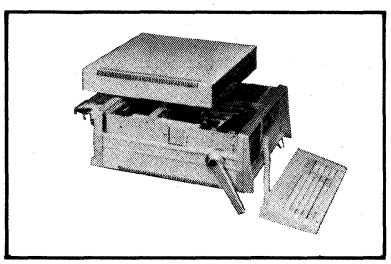
3U × 5-slot enclosure features recessed cards for clean front, better shielding and hidden routing of cables back to I/O. For rack mount or desktop applications. Front can be a panel or a hinged door. Also available in 2U × 3-slot and 4U × 7-slot systems.

SYSTEM 32

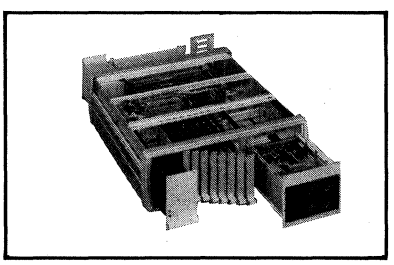


The Type 32 ELMA system enclosures are designed for desktop, portable or tower use. This lightweight all-aluminum construction comes in 2U, 3U, 4U, 6U and 13U heights/widths (1U = 1.75″). Depths are from 10 inches to 26 inches. Cover panels are scratch-resistant vinyl clad with a choice of several colors. This system can accept VME, Multibus II, PCbus and SUNbus boards up to 12 slots.

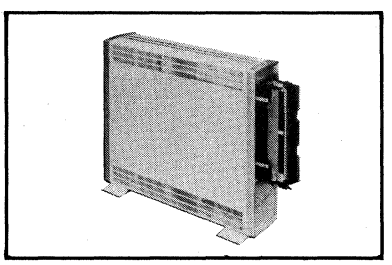
Shown at the right is a 4U × 7-slot Tower/desktop VME system. It includes a fan module and 250 watt switching power supply. The system is wired and tested with 7-slot J1 and J2 backplanes.



This ELMA keyboard system can accommodate up to 7 slots with built-in 9″ monitor or flat panel display. Keyboard is IBM PC XT/AT or ASCI-II type.



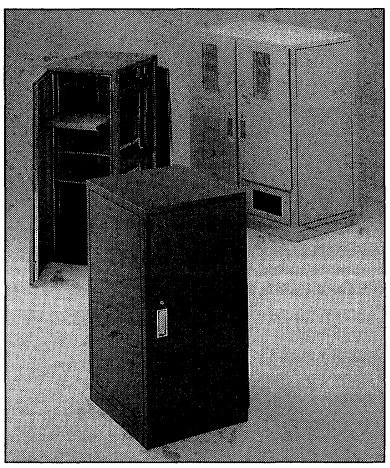
With a depth of 20 inches, this system can handle a variety of configurations. It is suitable for mounting boards and drives from front or rear. It is available in 5 or 7 slot configuration.

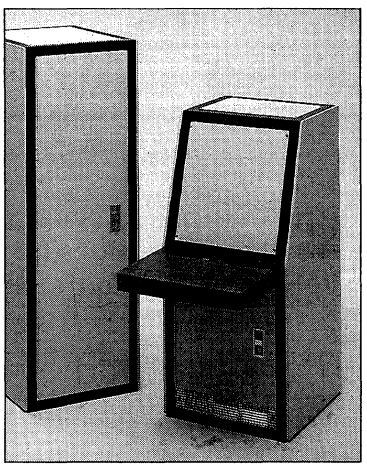


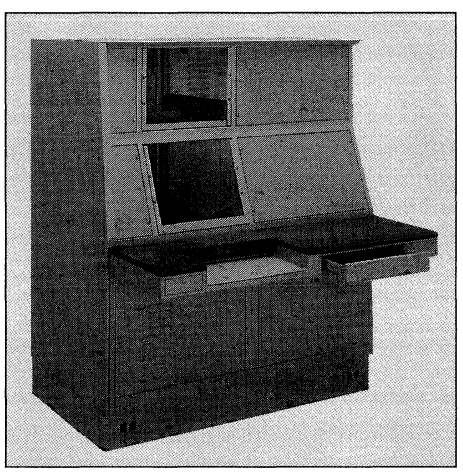
This SUN computer tower can handle up to eight SUNbus boards (9U × 400mm) or combinations of 3U and 6U high boards in depths of 160 to 400mm. It accepts several drive modules. Also available in 12 slot version in series 59 Tower.

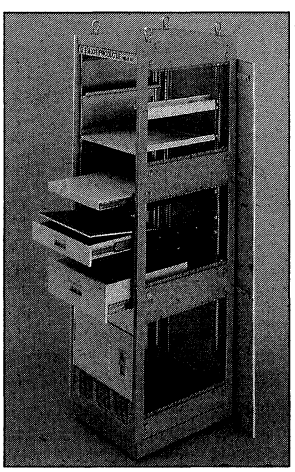
Be selective with Emcor Enclosures

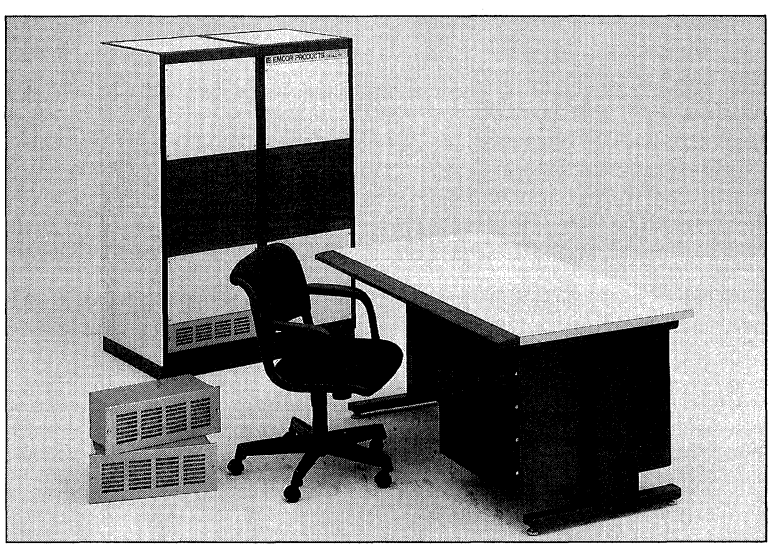
It's your choice of sizes, configurations, colors, shielding and accessories.











Modular Enclosure Systems

Create the right impression for your product with an Emcor enclosure. Choose from 6 distinct product lines and more than 9,000 items. Emcor is committed to giving you the best enclosure for your requirements, supplied just the way you want it and delivered when you need it. For those in a hurry, Instant Emcor offers a 5-day shipment program.

Shielded Enclosures: FCC & Military

Emcor offers two levels of shielding solutions: the FCC level EMI/RFI enclosures are designed for commercial applications and our Tempest-style enclosures meet the more demanding attenuation levels often required by the military. Both levels are tested to MIL STD 285.

Computer Support Furniture

Our Compudesk® line of computer support furniture offers two distinctive desk styles totaling over 500 different configurations and is compatible with our standard enclosure line. Also available are stand-alone auxiliary electronic pedestals and printer stands.

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No one is better suited to provide enclosures and consoles exactly to your specifications than EMCOR. From holes, cutouts and knockouts to special configurations, sizes and shapes—EMCOR will help you make your system functional.

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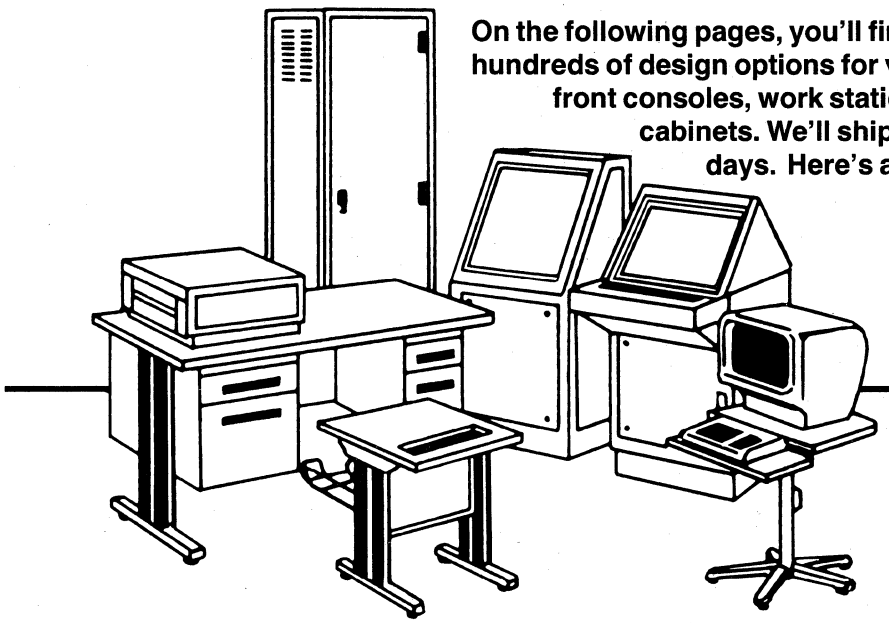
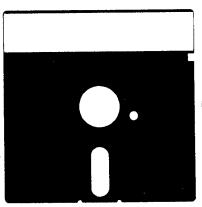
Choose any cabinet or work station from the following 9 pages and we'll ship it in 5 working days!

EXPRESS LINE
5 Day Service



On the following pages, you'll find choices that give you hundreds of design options for vertical cabinets, slope front consoles, work stations and instrument cabinets. We'll ship any of them in five working days. Here's all you need to do.



Phone for FREE IBM PC compatible Electronic Enclosure Design Program

1. Select the product you want
- ☐ Vertical Rack
- ☐ Slope Front Console
- ☐ Work Station
- ☐ Instrument Cabinet

2. Select the size and configuration desired. Diagrams and specification charts are provided with each product offered as guides.

3. Select accessories.

4. Select your colors. The following standard colors are available on any of our products. Custom colors are also available at no extra charge.

Standard colors are available in textured only. Two-tone color combinations available at no extra charge.

Antique White	Light Blue
Dove Grey	Sky Blue
Light Grey	Royal Blue
Charcoal Grey	Dark Blue
Satin Black	Beige
Russet	Dark Brown

Standard colors for laminated tops:
Eggshell Walnut
Teak

5. Call, FAX or mail your order to Equipto Electronics Corporation.

6. Need assistance? Call us and an

experienced customer service representative will answer your questions. Or, if needed, one of our design engineers can consult with you by phone or FAX, at no charge, on any size order.

7. Custom designs and special modifications are available upon request. Call for quotations and lead times.

As extensive as the selection is, it's only a representation of the thousands of choices to be found on a single page of our full line 304-page Equipto Electronics catalog. If you would like a copy, simply phone or FAX and we will be happy to provide it. We can also send our Engineering Design Kit that includes our catalog, an Easy Order/Quote Form, technical and pricing information and actual samples of corner assemblies and hardware for construction comparison.

Have questions about EMI/RFI FCC, Military, TEMPEST or EMP requirements? Our EMI/RFI Technical Guide answers the most common ones. Or telephone one of our design engineers for FREE consultation.

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Committed to Excellence Since 1960
EQUIPTO Electronics Corporation®

Heavy Duty Vertical Racks

EXPRESS LINE 5 Day Service

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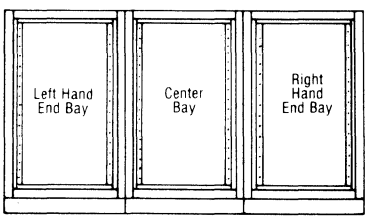
19" Wide Panels 24", 29" & 36" Deep

Heavy Duty Vertical Racks may be purchased in single or multi-bay combinations. Each bay is shipped assembled and comes complete with a frame with four panel mounting angles, frame base, side panels (as required), full length rear left hand door with lock and a top panel.

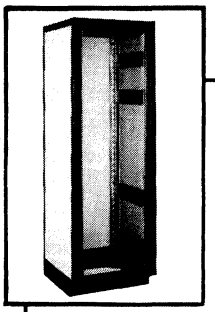
You may order your unit with ventilating louvers in which case it comes standard with louvered top and bottom side panels and rear left hand doors and fully louvered top panel.

The standard finish is textured baking enamel in a color of your choice from page C•1040.

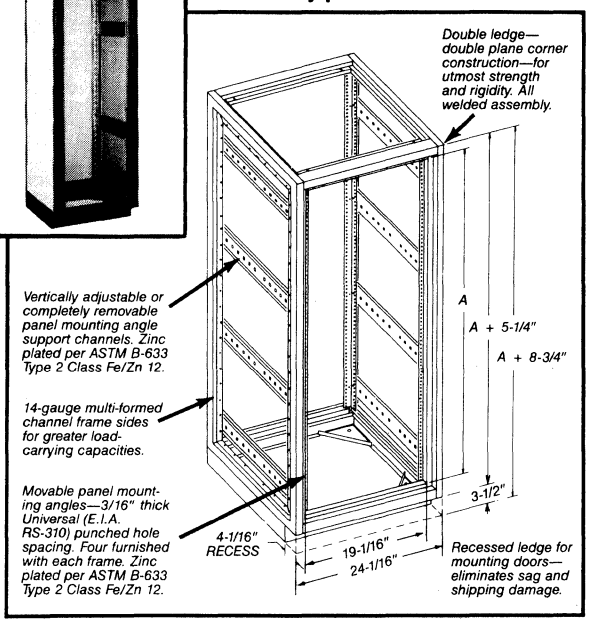
Multi-bay assemblies are shipped in individual cartons and include all necessary joining hardware.



This is a typical assembly of three cabinets

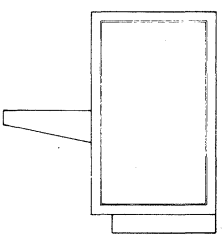


Commitment to quality... the hidden features that make EQUIPTO the industry pacesetter...



24" DEEP 19" Wide Vertical Rack Cabinets

SIZE OF FRONT & REAR PANEL OPENINGS Height "A"	PLAIN PANELS				LOUVERED PANELS			
	SINGLE BAY (2 side panels)	END BAY LEFT HAND (1 side panel)	CENTER BAY (No side panels)	END BAY RIGHT HAND (1 side panel)	SINGLE BAY (2 side panels)	END BAY LEFT HAND (1 side panel)	CENTER BAY (No side panels)	END BAY RIGHT HAND (1 side panel)
56⅛	XVS-156-24P	XVL-156-24P	XVC-156-24P	XVR-156-24P	XVS-156-24L	XVL-156-24L	XVC-156-24L	XVR-156-24L
63⅛	XVS-163-24P	XVL-163-24P	XVC-163-24P	XVR-163-24P	XVS-163-24L	XVL-163-24L	XVC-163-24L	XVR-163-24L
70⅛	XVS-170-24P	XVL-170-24P	XVC-170-24P	XVR-170-24P	XVS-170-24L	XVL-170-24L	XVC-170-24L	XVR-170-24L
77⅛	XVS-177-24P	XVL-177-24P	XVC-177-24P	XVR-177-24P	XVS-177-24L	XVL-177-24L	XVC-177-24L	XVR-177-24L
84⅛	XVS-184-24P	XVL-184-24P	XVC-184-24P	XVR-184-24P	XVS-184-24L	XVL-184-24L	XVC-184-24L	XVR-184-24L



To order laminated shelves see page C•1047.

29" DEEP 19" Wide Vertical Rack Cabinets

SIZE OF FRONT & REAR PANEL OPENINGS Height "A"	PLAIN PANELS				LOUVERED PANELS			
	SINGLE BAY (2 side panels)	END BAY LEFT HAND (1 side panel)	CENTER BAY (No side panels)	END BAY RIGHT HAND (1 side panel)	SINGLE BAY (2 side panels)	END BAY LEFT HAND (1 side panel)	CENTER BAY (No side panels)	END BAY RIGHT HAND (1 side panel)
56⅛	XVS-156-29P	XVL-156-29P	XVC-156-29P	XVR-156-29P	XVS-156-29L	XVL-156-29L	XVC-156-29L	XVR-156-29L
63⅛	XVS-163-29P	XVL-163-29P	XVC-163-29P	XVR-163-29P	XVS-163-29L	XVL-163-29L	XVC-163-29L	XVR-163-29L
70⅛	XVS-170-29P	XVL-170-29P	XVC-170-29P	XVR-170-29P	XVS-170-29L	XVL-170-29L	XVC-170-29L	XVR-170-29L
77⅛	XVS-177-29P	XVL-177-29P	XVC-177-29P	XVR-177-29P	XVS-177-29L	XVL-177-29L	XVC-177-29L	XVR-177-29L
84⅛	XVS-184-29P	XVL-184-29P	XVC-184-29P	XVR-184-29P	XVS-184-29L	XVL-184-29L	XVC-184-29L	XVR-184-29L

When casters are specified, dual wheel mar-proof casters are standard and have a rating of 200 pounds each. A flush caster base will be supplied in place of a recessed base when casters are ordered. 4 required for each bay.

If casters are required, add the suffix-C to the assembly number.
Example: XVS-156-24P-C

36" DEEP 19" Wide Vertical Rack Cabinets

SIZE OF FRONT & REAR PANEL OPENINGS Height "A"	PLAIN PANELS				LOUVERED PANELS			
	SINGLE BAY (2 side panels)	END BAY LEFT HAND (1 side panel)	CENTER BAY (No side panels)	END BAY RIGHT HAND (1 side panel)	SINGLE BAY (2 side panels)	END BAY LEFT HAND (1 side panel)	CENTER BAY (No side panels)	END BAY RIGHT HAND (1 side panel)
56⅛	XVS-156-36P	XVL-156-36P	XVC-156-36P	XVR-156-36P	XVS-156-36L	XVL-156-36L	XVC-156-36L	XVR-156-36L
63⅛	XVS-163-36P	XVL-163-36P	XVC-163-36P	XVR-163-36P	XVS-163-36L	XVL-163-36L	XVC-163-36L	XVR-163-36L
70⅛	XVS-170-36P	XVL-170-36P	XVC-170-36P	XVR-170-36P	XVS-170-36L	XVL-170-36L	XVC-170-36L	XVR-170-36L
77⅛	XVS-177-36P	XVL-177-36P	XVC-177-36P	XVR-177-36P	XVS-177-36L	XVL-177-36L	XVC-177-36L	XVR-177-36L
84⅛	XVS-184-36P	XVL-184-36P	XVC-184-36P	XVR-184-36P	XVS-184-36L	XVL-184-36L	XVC-184-36L	XVR-184-36L

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Challenger® Vertical Racks

EXPRESS LINE 5 Day Service

Committed to Excellence Since 1960
EQUIPTO Electronics Corporation®

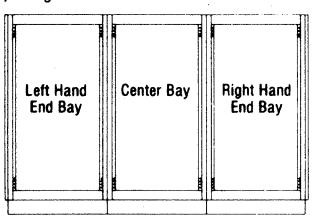
19" Wide Panels 25½" & 30¾" Deep

Challenger Vertical Racks may be purchased in single or multi-bay combinations. Each bay is shipped assembled and comes complete with a frame with four panel mounting angles, frame base, universal side panels (as required), full length face mounted left hand rear door and top panel.

You may order your unit with ventilating louvers in which case it comes standard with louvered top and bottom side panels and left hand rear door and top panel.

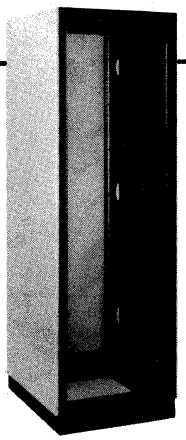
The standard finish is textured baking enamel in a color of your choice from those stated on page C•1040.

Multi-bay assemblies are shipped in individual cartons and include all necessary joining hardware.



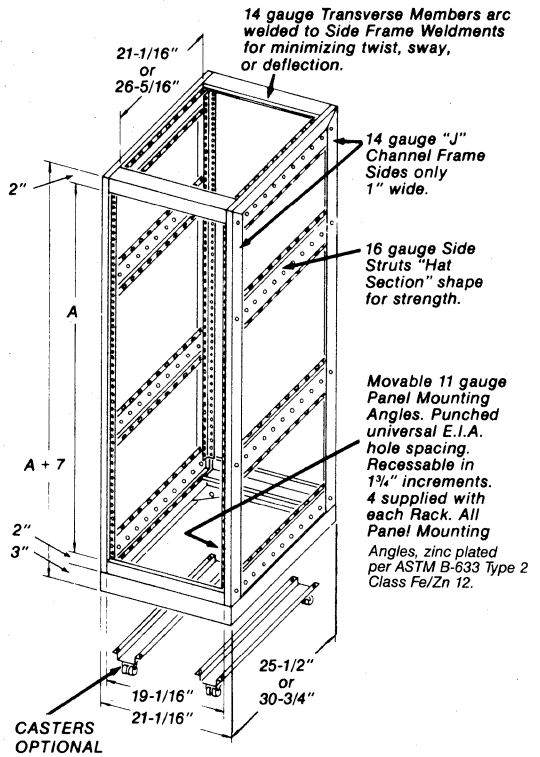
This is a typical assembly of three cabinets

*If casters are required add the suffix -C to the assembly number.
Example: XV-S221-3P-C



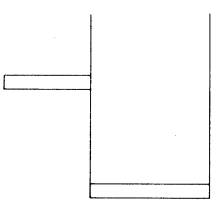
NOTE:
Universal side panels are externally removable with a slide-lift motion with provisions for fastening internally. Two side panels add 1¼" to overall width of cabinet.

POSITIVE DOOR LATCHING IS STANDARD.
There are no rubber, plastic or magnetic parts used which could prevent U.L. or OSHA acceptance. Also, metal-to-metal provides grounding that other methods do not.



25½" DEEP 19" Wide Vertical Rack Cabinets

SIZE OF FRONT & REAR PANEL OPENINGS Height "A"	PLAIN PANELS				LOUVERED PANELS			
	SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND	SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND
22⅞	XV-S221-3P	XV-L221-3P	XV-C221-3P	XV-R221-3P	XV-S221-3L	XV-L221-3L	XV-C221-3L	XV-R221-3L
35⅛	XV-S351-3P	XV-L351-3P	XV-C351-3P	XV-R351-3P	XV-S351-3L	XV-L351-3L	XV-C351-3L	XV-R351-3L
52⅝	XV-S521-3P	XV-L521-3P	XV-C521-3P	XV-R521-3P	XV-S521-3L	XV-L521-3L	XV-C521-3L	XV-R521-3L
61⅜	XV-S611-3P	XV-L611-3P	XV-C611-3P	XV-R611-3P	XV-S611-3L	XV-L611-3L	XV-C611-3L	XV-R611-3L
70⅛	XV-S701-3P	XV-L701-3P	XV-C701-3P	XV-R701-3P	XV-S701-3L	XV-L701-3L	XV-C701-3L	XV-R701-3L
78⅞	XV-S781-3P	XV-L781-3P	XV-C781-3P	XV-R781-3P	XV-S781-3L	XV-L781-3L	XV-C781-3L	XV-R781-3L



To order laminated shelves see page C•1048.

30¾" DEEP 19" Wide Vertical Rack Cabinets

SIZE OF FRONT & REAR PANEL OPENINGS Height "A"	PLAIN PANELS				LOUVERED PANELS			
	SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND	SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND
22⅞	XV-S221-4P	XV-L221-4P	XV-C221-4P	XV-R221-4P	XV-S221-4L	XV-L221-4L	XV-C221-4L	XV-R221-4L
35⅛	XV-S351-4P	XV-L351-4P	XV-C351-4P	XV-R351-4P	XV-S351-4L	XV-L351-4L	XV-C351-4L	XV-R351-4L
52⅝	XV-S521-4P	XV-L521-4P	XV-C521-4P	XV-R521-4P	XV-S521-4L	XV-L521-4L	XV-C521-4L	XV-R521-4L
61⅜	XV-S611-4P	XV-L611-4P	XV-C611-4P	XV-R611-4P	XV-S611-4L	XV-L611-4L	XV-C611-4L	XV-R611-4L
70⅛	XV-S701-4P	XV-L701-4P	XV-C701-4P	XV-R701-4P	XV-S701-4L	XV-L701-4L	XV-C701-4L	XV-R701-4L
78⅞	XV-S781-4P	XV-L781-4P	XV-C781-4P	XV-R781-4P	XV-S781-4L	XV-L781-4L	XV-C781-4L	XV-R781-4L

**When ordered, dual wheel mar-proof casters are standard and rated at 200 pounds each. 4 required for each bay.*

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Challenger®
15° Sloped Front Consoles

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EQUIPTO Electronics Corporation®

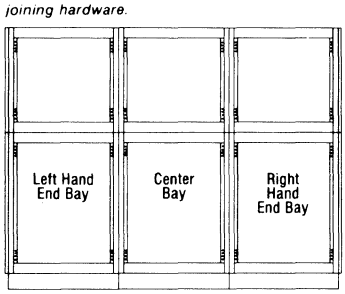
25½" & 30¾" Deep

Challenger Slope Front Consoles may be purchased in single or multi-bay combinations. The slope of the front panel is 15° from the vertical. Each bay is shipped assembled and comes complete with a frame with six panel mounting angles, frame base, universal side panels (as required), full length face mounted left hand rear door, and top panel.

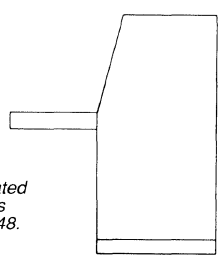
You may order your unit with ventilating louvers in which case it comes standard with louvers at bottom of the side panels, louvered top and bottom left hand rear door, and louvered top panel.

The standard finish is textured baking enamel in a color of your choice from those stated on page C•1040.

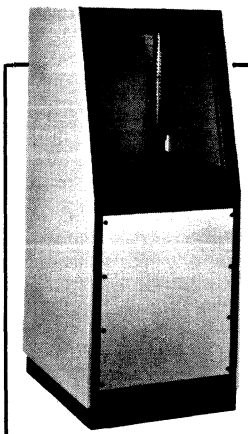
Multi-bay assemblies are shipped in individual cartons and include all necessary joining hardware.

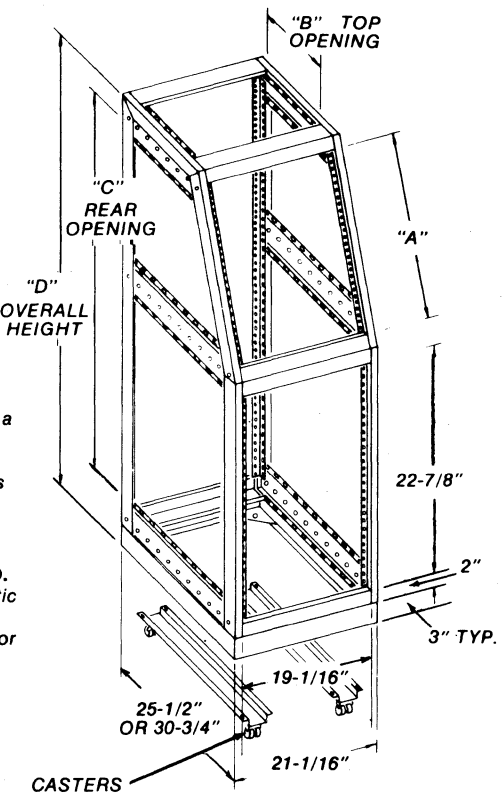


This is a typical assembly of three cabinets



To order laminated console shelves see page C•1048.





NOTE:
Universal side panels are externally removable with a slide-lift motion with provisions for fastening internally. Two side panels add 1¼" to overall width of cabinet.

POSITIVE DOOR LATCHING IS STANDARD. *There are no rubber, plastic or magnetic parts used which could prevent U.L. or OSHA acceptance. Also, metal-to-metal provides grounding that other methods do not.*

19" WIDE PANEL SPACE				
DEPTH	A	B	C	D
25½	17⅝	15 13/16	43⅞	50⅞
30¾	17⅝	21 1/16	43⅞	50⅞
25½	21⅛	14 1/16	47⅜	54⅜
30¾	21⅛	19 5/16	47⅜	54⅜

*If casters are required add the suffix -C to the assembly number.
Example: XS-S171-3P-C

25½" & 30¾" DEEP 19" Wide 15° Sloped Front Consoles

DEPTH	HEIGHT OF SLOPED OPENING "A"	PLAIN PANELS				LOUVERED PANELS			
		SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND	SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND
25½"	17⅝	XS-S171-3P	XS-L171-3P	XS-C171-3P	XS-R171-3P	XS-S171-3L	XS-L171-3L	XS-C171-3L	XS-R171-3L
	21⅛	XS-S211-3P	XS-L211-3P	XS-C211-3P	XS-R211-3P	XS-S211-3L	XS-L211-3L	XS-C211-3L	XS-R211-3L
30¾"	17⅝	XS-S171-4P	XS-L171-4P	XS-C171-4P	XS-R171-4P	XS-S171-4L	XS-L171-4L	XS-C171-4L	XS-R171-4L
	21⅛	XS-S211-4P	XS-L211-4P	XS-C211-4P	XS-R211-4P	XS-S211-4L	XS-L211-4L	XS-C211-4L	XS-R211-4L

**When ordered, dual wheel mar-proof casters are standard and rated at 200 pounds each. 4 required for each bay.*

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Challenger®
Low Profile Cabinets

EXPRESS LINE 5 Day Service

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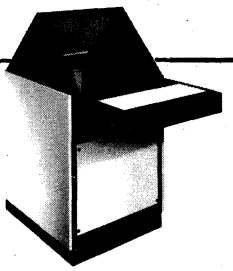
EQUIPTO Electronics Corporation®

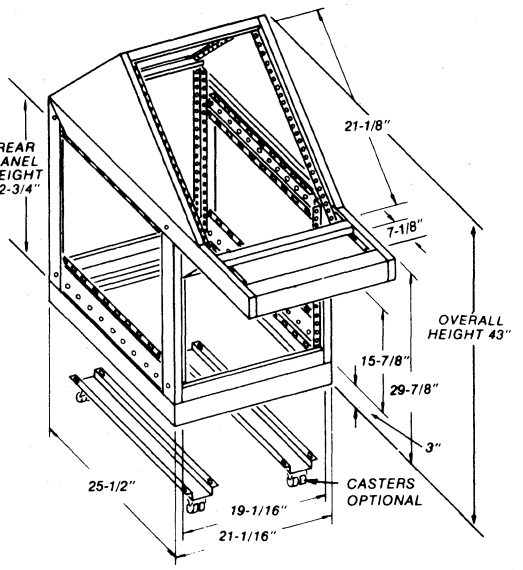
19" Wide Panels 25½" Deep Frame

Challenger Low Profile Consoles may be purchased in single or multi-bay combinations. The slope of the front panel is 45° from the vertical. Each bay is shipped assembled and comes complete with a frame with eight panel mounting angles, frame base, universal side panels (as required), full length surface mounted left hand rear door, top panel and lower front panel.

You may order your unit with ventilating louvers in which case it comes standard with louvers at bottom of the side panels, louvered top and bottom left hand rear door, fully louvered top rear slope panel and plain lower front panel.

The standard finish is textured baking enamel in a color of your choice from those stated on page C•1040.

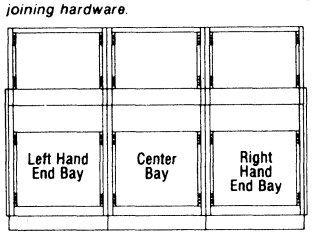




NOTE:
Challenger low profile consoles are furnished with adjustable Panel Mounting Angles in the front and rear lower openings; the angles in the sloped opening are fixed and not removable.

Universal Side Panels are externally removable with a slide-lift motion with provisions for fastening internally

Multi-bay assemblies are shipped in individual cartons and include all necessary joining hardware.



Typical three bay assembly

*If casters are required add the suffix -C to the assembly number.
Example: XL-S211-3P-C

25½" DEEP 19" Wide Low Profile Cabinet

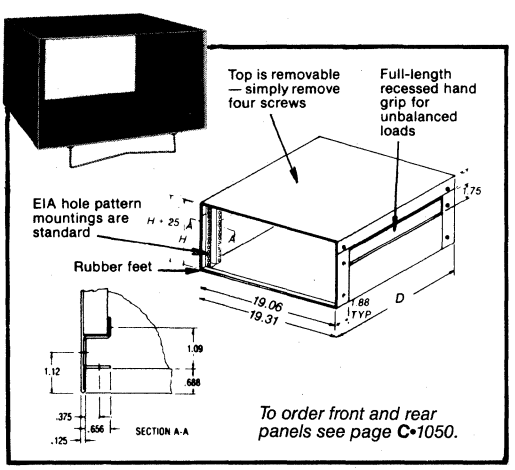
PLAIN PANELS				LOUVERED PANELS			
SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND	SINGLE BAY	END BAY LEFT HAND	CENTER BAY NO SIDE PANELS	END BAY RIGHT HAND
XL-S211-3P	XL-L211-3P	XL-C211-3P	XL-R211-3P	XL-S211-3L	XL-L211-3L	XL-C211-3L	XL-R211-3L

When ordered, dual wheel mar-proof casters are standard and rated at 200 pounds each. 4 required for each bay.

Instrument Cabinets

Instrument cabinets are constructed of 16 ga. steel and come with 4 panel mounting angles, zinc plated. Standard finish is textured baking enamel in a color of your choice from color chart on page C•1040.

Mar-Proof Screws for mounting ⅛" flat or ⅛" formed instrument panels
Phillips head, sheet metal screws, with recessed Mar-Proof black nylon washers, and Speed Nut® part 80-0414-03 are used to fasten instrument panels to punched panel mounting angles. Screw 80-0101-05 10B x 1⅛" is used with ⅝" formed panels; screw 80-0102-05 10B x ⅝" is used with ⅛" panels. Screws are nickel plated.



To order front and rear panels see page C•1050.

19" Wide Instrument Cabinets

Vert. Panel Opening "H"	19.06 PANEL OPENING WIDTH	
	"D" = 18.5	"D" = 22.0
5.34	SC-1918-05	SC-1922-05
7.09	SC-1918-07	SC-1922-07
8.84	SC-1918-08	SC-1922-08
10.59	SC-1918-10	SC-1922-10
12.34	SC-1918-12	SC-1922-12
14.09	SC-1918-14	SC-1922-14
15.84	SC-1918-15	SC-1922-15
17.59	SC-1918-17	SC-1922-17
19.34	SC-1918-19	SC-1922-19
21.09	SC-1918-21	SC-1922-21

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Quiptron®
Modular Work Stations

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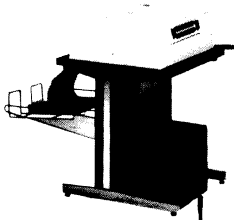
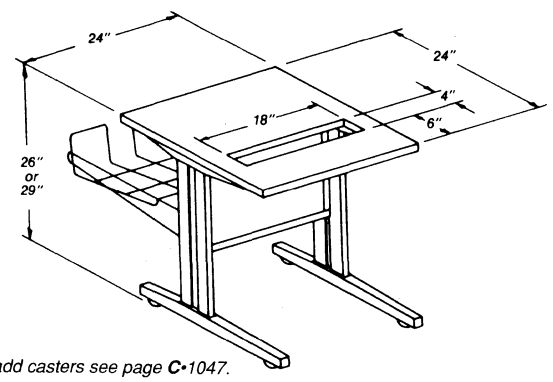
EQUIPTO Electronics Corporation®

Universal Printer Stands

Features
- 2 Standard Heights
- Tops have Threaded Inserts
- Rear Mounted Copy Holder
- Your choice of paint color for modesty panel
- Teak woodgrain laminated top
- Legs are satin black and brite chrome
- Adjustable Leveling Glides



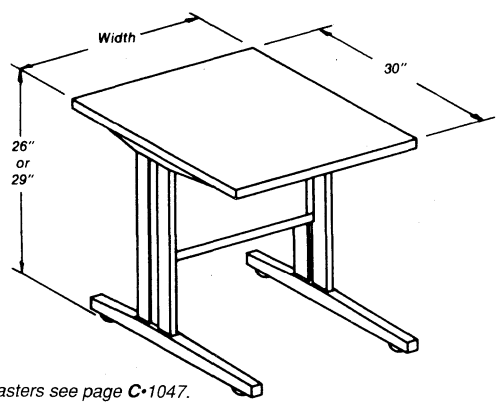


MODEL NO.	HEIGHT*
PS1-2424-26C	26" Keyboard Height
PS1-2424-29C	29" Desk Height

To add casters see page C•1047.

Work Stations and CRT Stands

Features
- 2 Heights offered
- 3 Standard Widths
- Tops have Threaded Inserts
- Legs are satin black and brite chrome
- Your choice of paint color for modesty panel
- Teak woodgrain laminated top
- Adjustable Leveling Guides



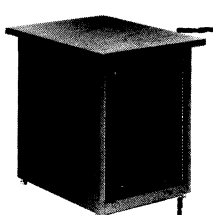
HEIGHT*	MODEL NO.	WIDTH
26" Keyboard Height	WS1-3036-26P	36
	WS1-3048-26P	48
	WS1-3060-26P	60
29" Desk Height	WS1-3036-29P	36
	WS1-3048-29P	48
	WS1-3060-29P	60

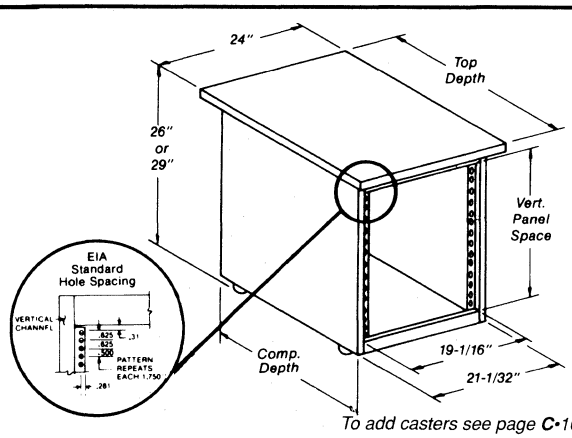
*Casters add 1½" to overall height

To add casters see page C•1047.

Pedestal Electronic Work Station

Features
- 2 Standard Heights
- 2 Standard Depths
- Tops have Threaded Inserts
- Choice of paint color
- Teak woodgrain laminated top
- Adjustable Leveling Glides





HEIGHT*	MODEL NO.	TOP DEPTH	COMP. DEPTH
26" Keyboard Height 21 1/16" Vert. Panel Space	WS2-1925-26P	30	25½
	WS2-1930-26P	36	30¾
29" Desk Height 22⅞" Vert. Panel Space	WS2-1925-29P	30	25½
	WS2-1930-29P	36	30¾

*Casters add 1½" to overall height

To add casters see page C•1047.

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Quiptron®
Modular Work Stations

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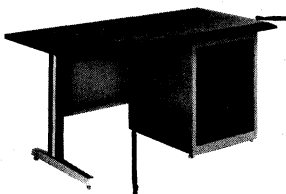
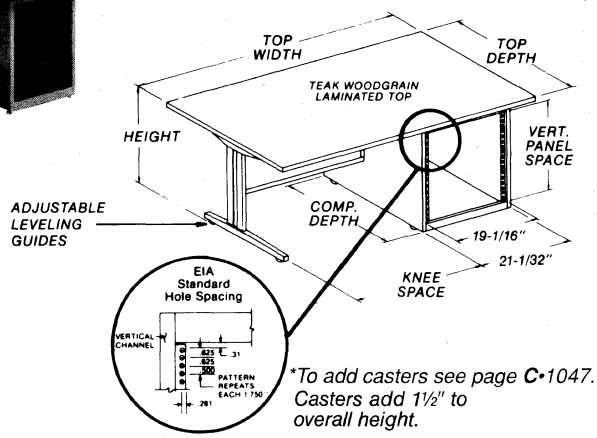
Work Station with Electronic Compartment

Ordering Information
Electronic compartments can be furnished to be installed on the left or right side. Unless otherwise specified, right hand compartments will be furnished as shown.

Electronic compartments are furnished standard with a plain bottom panel. Teak woodgrain laminated top standard. Specify finish. See page **C**•1040 for available colors.





*To add casters see page **C**•1047. Casters add 1½" to overall height.

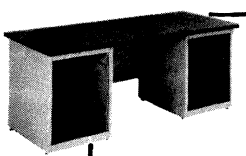
HEIGHT*	MODEL NO.	TOP DEPTH	TOP WIDTH	COMP. DEPTH	KNEE SPACE
26" Keyboard Height 21 1/16" Vert. Panel Space	WS3-1925-26P	30	60	25½	28
	WS3-1925-26W	30	72	25½	40
	WS3-1930-26P	36	60	30¾	28
	WS3-1930-26W	36	72	30¾	40
29" Desk Height 22⅞" Vert. Panel Space	WS3-1925-29P	30	60	25½	28
	WS3-1925-29W	30	72	25½	40
	WS3-1930-29P	36	60	30¾	28
	WS3-1930-29W	36	72	30¾	40

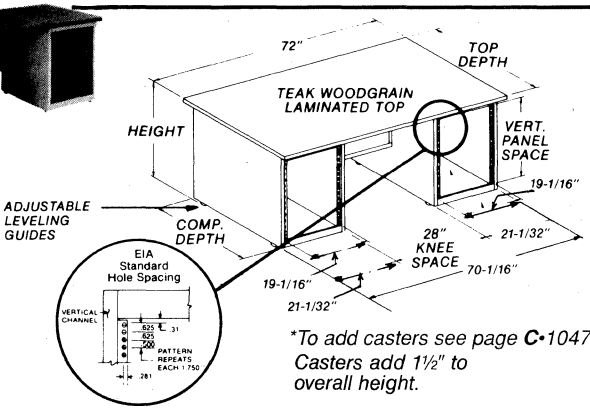
Work Station with (2) Electronic Compartments

Ordering Information
Electronic compartment comes with 4 adjustable mounting angles with standard EIA hole spacing.

Specify finish. See page C•1040 for available colors. Teak woodgrain laminated top standard.

Electronic compartments are furnished standard with a plain bottom panel.



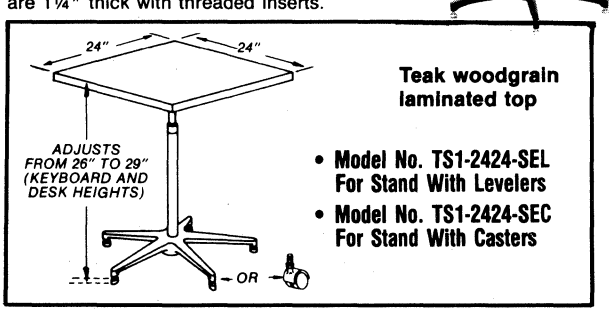


*To add casters see page **C**•1047. Casters add 1½" to overall height.

HEIGHT*	MODEL NO.	TOP DEPTH	COMP. DEPTH
26" Keyboard Height 21 1/16" Vert. Panel Space	WS6-1925-26P	30	25½
	WS6-1930-26P	36	30¾
29" Desk Height 22⅞" Vert. Panel Space	WS6-1925-29P	30	25½
	WS6-1930-29P	36	30¾

Terminal Stands

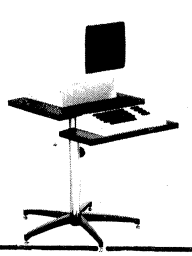
Series TS1 Terminal Stands rotate 360° to allow CRT terminals, typewriters, fiche readers, etc. to be shared by different operators. With casters they can be moved from station to station. Casters have mobility load rating of 75 lbs. each. Base is cast aluminum with 5 legs for stability with an adjustable shaft to provide keyboard and desk heights with casters or levelers. Tops are 1¼" thick with threaded inserts.

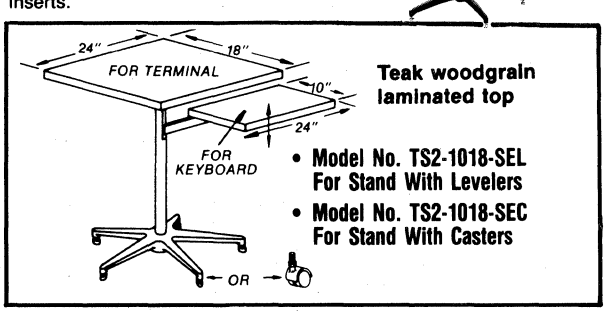


Teak woodgrain laminated top

- **Model No. TS1-2424-SEL For Stand With Levelers**
- **Model No. TS1-2424-SEC For Stand With Casters**

Series TS2 (bi-level) Terminal Stands offer different heights for CRT and keyboard. Keyboard platform can be adjusted up and down and has side to side rotation for station sharing. Base is cast aluminum with 5 legs for stability. Available with casters or levelers. Tops are 1¼" thick with threaded inserts.





Teak woodgrain laminated top

- **Model No. TS2-1018-SEL For Stand With Levelers**
- **Model No. TS2-1018-SEC For Stand With Casters**

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Accessories

EXPRESS LINE 5 Day Service

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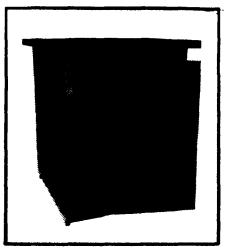
Electronic Compartment Doors

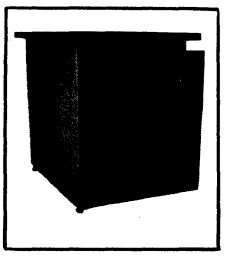


- Heavy 16-gauge construction
- Instantly removable by retractable, spring-loaded hinge pins
- Chrome and black vinyl, modern-design door handles
- Hidden magnetic latching
- Mounted front or rear or both

PART NUMBER				
IDENTIFIER Comp. Door	PANEL HEIGHT*	PANEL WIDTH	RIGHT HAND (R) OR LEFT HAND (L)	PLAIN (P) OR LOUVERED (L)
CD	21	19	R or L	P or L
CD	22	19	R or L	P or L

When ordering compartment doors, specify whether doors are to be mounted in the front or rear.

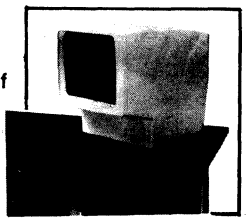
Acrylic Window Doors



- Visual access thru tinted acrylic
- Heavy gauge formed 1⅞" deep
- Hidden magnetic latching
- Mounted front only
- Instantly removable by retractable, spring-loaded hinge pins
- Used on any electronic compartment

PART NUMBER			
ACRYLIC WINDOW DOOR	PANEL HEIGHT	PANEL WIDTH	RIGHT HAND (RH) OR LEFT HAND (LH)
PX	21	19	RH or LH
PX	22	19	RH or LH

CRT Turntable

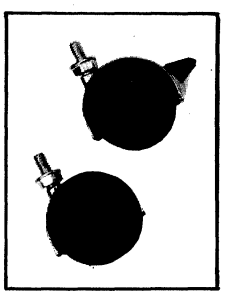


Turntables allow two or more operators to share the same piece of equipment, offering each the best viewing angle. Standard tops are 18" x 18" made from high pressure Teak woodgrain laminate.

Turntables have 360° rotation on 12" diameter bearing circle.

Part Number TTI-1818-12S

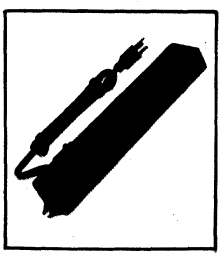
Casters for Quiptron Work Stations



Equipto Electronics' contemporary styled design provides great mobility with the twin wheels. Construction is a sturdy bright chrome plated die-cast hood with nylon wheels. Each caster has mobility load rating of 75 lbs. Add 1½" to height.

Part Number
EDC-0275-BCP (Plain)
EDC-0275-BCL (Locking)

Outlet Strip



This is a wired, heavy-duty, 6 outlet strip with switch and UL approved components. Long lasting indicator lamp denotes "power-on." Box contains a 15 amp circuit breaker. 12 foot long 3-wired grounded service cord.

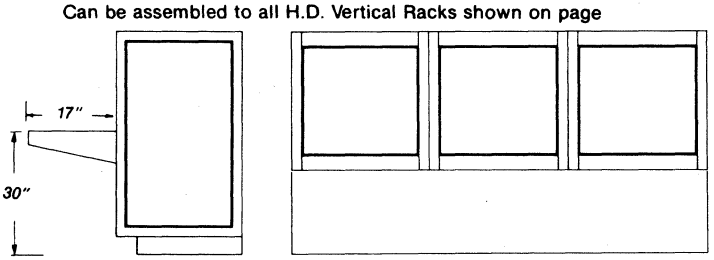
Part Number 0S-0612-GC

Laminated Shelves for Heavy Duty Racks

Laminated Plastic Console Shelves are available in single, double or triple width units, for single or multiple cabinet assemblies. The support arms, frame adaptor panels, and lower front knee space panel are painted to match cabinet colors.

Laminated Plastic Shelves are constructed of ¾" thick particle board with a solid eggshell laminated plastic sheet bonded to the top, front and sides. These Console Shelves are attached to the cabinet frame with rugged 14 gauge steel support arms. They are bolted directly to the 3/16" thick Panel Mounting Angles for positive support. The support arms do not project into the interior of the cabinet frame to interfere with equipment location or installation. The assembly includes knee space panel to enclose panel opening under the shelf. The Laminated Plastic Shelves and mounting arms are shipped with all mounting hardware included.

Can be assembled to all H.D. Vertical Racks shown on page



Vertical Rack Cabinets

Triple-Width Laminated Plastic Console Shelf attached to three bay cabinet assembly

LAMINATED PLASTIC CONSOLE SHELVES—FOR H.D. VERTICAL RACK		
FOR A SINGLE FRAME ONLY	FOR TWO FRAMES JOINED SIDE BY SIDE	FOR THREE FRAMES JOINED SIDE BY SIDE
Width of Panel Space 19"	Width of Panel Space 19"	Width of Panel Space 19"
XW1-V19-017	XW2-V19-017	XW3-V19-017

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Instrument Panels/ Panel Shims

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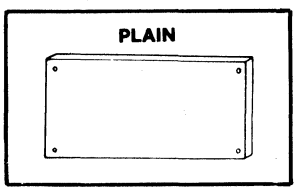
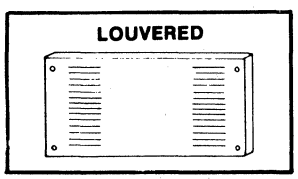
5/8" Formed Panels

Plain and Louvered Panels can be used in all panel openings in all Cabinet Frames. They may be used as Instrument Panels, Front Panels, Rear Panels, or Filler Panels. They are formed 5/8" thick 16 gauge cold rolled steel with a single flange. They are made for EIA Universal Standard RS-310 hole spacing. Mounting hardware furnished, consisting of sheet metal screws, using Mar-Proof recessed black nylon washers and Speed Nuts.



Plain Formed Instrument Panels



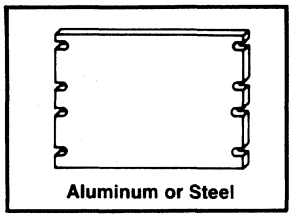
Louvered Formed Instrument Panels have two rows of louvers full height.

19" WIDE 5/8" FORMED PANELS

HEIGHT OF PANEL	PLAIN PART NUMBER	LOUVERED PART NUMBER
1¾"	20-0112-46	
3½"	20-0312-46	
5¼"	20-0512-46	
7"	20-0712-46	20-0712-11
8¾"	20-0812-46	20-0812-11
10½"	20-1012-46	20-1012-11
12¼"	20-1212-46	20-1212-11
14"	20-1412-46	20-1412-11
15¾"	20-1512-46	20-1512-11
17½"	20-1712-46	20-1712-11
19¼"	20-1912-46	20-1912-11
21"	20-2112-46	20-2112-11
22¾"	20-2212-46	20-2212-11
24½"	20-2412-46	20-2412-11
26¼"	20-2612-46	20-2612-11
28"	20-2812-46	20-2812-11
29¾"	20-2912-46	20-2912-11
35"	20-3512-46	20-3512-11
36¾"	20-3612-46	20-3612-11
40¼"	20-4012-46	20-4012-11
42"	20-4212-46	20-4212-11
43¾"	20-4312-46	20-4312-11
47¼"	20-4712-46	20-4712-11
49"	20-4912-46	20-4912-11
52½"	20-5212-46	20-5212-11
56"	20-5612-46	20-5612-11
61¼"	20-6112-46	20-6112-11
70"	20-7012-46	20-7012-11
78¾"	20-7812-46	20-7812-11

1/8" Thick Instrument Panels

Flat Plate Instrument Panels are available in 1/8" thick cold rolled steel or aluminum. They are slotted for EIA Universal Standard RS-310 hole spacing. Mounting hardware furnished, consisting of sheet metal screws, using Mar-Proof recessed black nylon washers and Speed Nuts.



Aluminum or Steel

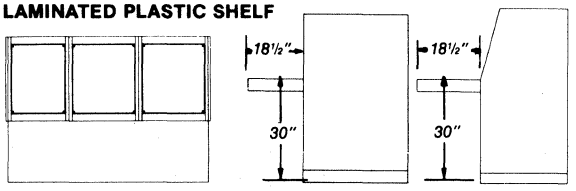
1/8" THICK FLAT PLATE INSTRUMENT PANELS

HEIGHT OF FLAT PANEL	19" PANEL WIDTH Steel Panels PART NUMBERS	Aluminum Panels PART NUMBERS
1¾"	21-0112-11	21-0112-41
3½"	21-0312-11	21-0312-41
5¼"	21-0512-11	21-0512-41
7"	21-0712-11	21-0712-41
8¾"	21-0812-11	21-0812-41
10½"	21-1012-11	21-1012-41
12¼"	21-1212-11	21-1212-41
14"	21-1412-11	21-1412-41
15¾"	21-1512-11	21-1512-41
17½"	21-1712-11	21-1712-41
19¼"	21-1912-11	21-1912-41
21"	21-2112-11	21-2112-41
22¾"	21-2212-11	21-2212-41
24½"	21-2412-11	21-2412-41
26¼"	21-2612-11	21-2612-41
28"	21-2812-11	21-2812-41

Laminated Shelves for Challenger Racks & Consoles

Challenger Console Shelves constructed of white Laminated Plastic are supported with a mounting arm and bracket system. The one piece white laminated plastic top surface and the laminated plastic sides and front edge make an easily maintained, attractive work area. Made of particle board with laminated plastic sheet bonded to the top and edge surfaces. The Mounting parts and lower front knee panel are painted to match cabinet colors and are shipped installed in the cabinet; the Laminated Plastic Shelves and Mounting Arms are shipped separately with all mounting hardware included.

LAMINATED PLASTIC SHELF



Triple-Width Laminated Plastic console shelf attached to three bay cabinet assembly

Can be assembled to all. Challenger cabinets shown on pages C•1042 & C•1043

WORK/WRITING SHELVES — LAMINATED PLASTIC FOR CHALLENGER ASSEMBLIES

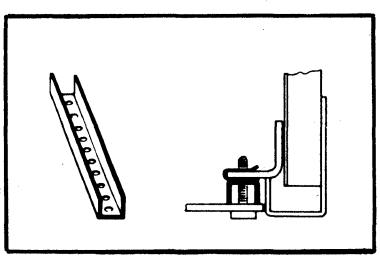
FOR CABINET FRAMES WITH A 19" WIDE PANEL SPACE

TYPE OF CABINET	OVERALL DEPTH OF FRAMES	FOR A SINGLE FRAME ONLY PART NO.	FOR TWO FRAMES JOINED SIDE BY SIDE PART NO.	FOR THREE FRAMES JOINED SIDE BY SIDE PART NO.
Vertical Rack	25½ 30¾	XW-1V25-18 XW-1V30-18	XW-2V25-18 XW-2V30-18	XW-3V25-18 XW-3V30-18
Sloped Console	25½ 30¾	XW-1S25-18 XW-1S30-18	XW-2S25-18 XW-2S30-18	XW-3S25-18 XW-3S30-18

Assembly includes knee space panel to enclose panel opening under shelf.

Panel Shims

Panel Shims are made of 16 gauge cold rolled steel formed into a "U" shaped channel. They are used to bring flat panels into alignment with the face of the formed panels when Flat Plate Instrument Panels are used in combination with 5/8" Formed Instrument Panels in the same panel area. Generally, they are shipped along with the flat panels which are attached to the cabinet frame.



Sketch at left shows a Panel Shim in place between flat plate panel and panel mounting angle.

PANEL SHIMS FOR USE WITH 1/8" THICK PANELS

HEIGHT OF FLAT PANEL	PART NUMBER OF SHIM
1¾"	86-0112-02
3½"	86-0312-02
5¼"	86-0512-02
7"	86-0712-02
8¾"	86-0812-02
10½"	86-1012-02
12¼"	86-1212-02
14"	86-1412-02
15¾"	86-1512-02
17½"	86-1712-02
19¼"	86-1912-02
21"	86-2112-02

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Panel Mounting Angles and Hardware

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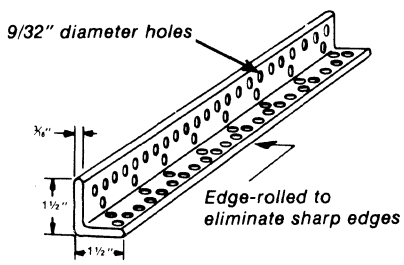
Panel Mounting Angles for Heavy Duty Racks

All Vertical Rack Cabinets are supplies with 4 Punched Panel Mounting Angles, 2 at the front and 2 at the rear of the cabinet frame. You may require additional Panel Mounting Angles; or, you may wish tapped angles. Whatever your requirement might be, the chart below will enable you to select the part number of the Panel Mounting Angles you need to fit the Vertical Rack frame you are using.



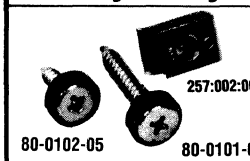
Panel mounting holes are on Universal spacing E.I.A. Standard RS-310. Punched for Speed Nuts® or tapped 10-32 on face leg.

The "Universal" hole spacing for mounting instrument panels was first developed and perfected for Modular Enclosures by Equipto Electronics Corporation engineers.

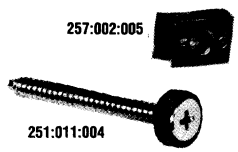
PANEL MOUNTING ANGLES FOR VERTICAL RACK FRAMES

OVERALL HEIGHT OF FRAME	HEIGHT OF PANEL SPACE	FOR FRONT OR REAR OPENINGS ZINC PLATED	
		PUNCHED	TAPPED
64⅞"	56⅛"	010:056:010	010:056:012
71⅞"	63⅛"	010:063:010	010:063:012
78⅞"	70⅛"	010:070:010	010:070:012
85⅞"	77⅛"	010:077:010	010:077:012
92⅞"	84⅛"	010:084:010	010:084:012

Heavy Duty Hardware

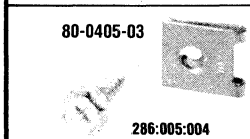


Mar-Proof Screws and Speed Nuts® for mounting flat or ⅝" formed instrument panels
Phillips Head sheet metal screws, with recessed Mar-Proof* black nylon washers and Speed Nut® Part 257:002:005 are used to fasten instrument Panels to punched Panel Mounting Angles. Screw 80:0101:05, 10B x 1⅛", is used with ⅝" formed panels; screw 80:0102:05, 10B x ⅝", is used with flat panels. Screws are nickel plated. Speed Nuts® are painted an aluminum finish.

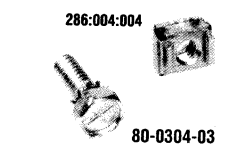


Mar-Proof Screws and Speed Nuts® for mounting rear panels, front panels and flush filler panels
Rear Panels, Flush Filler Panels, and Front Panels are mounted in the cabinet frame recess, but fastened to the punched Panel Mounting Angles with Phillips Head sheet metal screws 10B x 2", Part 251:011:004, with recessed Mar-Proof* black nylon washers and Speed Nut® Part 257:002:005. The screws are nickel plated; the Speed Nuts® are painted an aluminum finish.

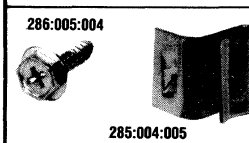
Mar-Proof Machine Screws for mounting flat or ⅝" formed instrument panels
If tapped Panel Mounting Angles have been substituted for punched angles, the Flat or ⅝" Formed Instrument Panels are fastened to the mounting angles with machine screws. These are 10-32 x 1" Phillips Head, used with a Mar-Proof* recessed black nylon washer. They are part 80:0201:05, nickel plated.



Screws and Speed Nuts® for mounting Panel Mounting Angle Support Channels and Top Panels
The Top Panel and the Panel Mounting Angle Support Channels are fastened to all Vertical Rack and Sloped Front Cabinet frames with 10BA x 23/32" Phillips Hex Head sheet metal screws, Part 286:005:004 and Speed Nuts®, Part 80:0405:03. The screws are zinc plated, the Speed Nuts are painted an aluminum finish.



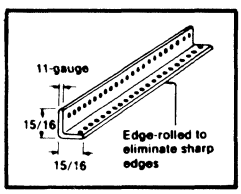
Cage Nuts and Screws for attaching Panel Mounting Angles to Panel Mounting Angle Support Channels
Panel Mounting Angles are attached to Panel Mounting Angle Support Channels with ¼-20 x ¾" Hex Head Sems machine screws, Part 80:0304:03, and ¼-20 cage nuts, Part 286:004:004. When attached to fixed brackets, the angles are fastened with the same screws engaging ¼-20 spot-weld nuts. The screws and cage nuts are zinc plated.



Sheet Metal Screws and Speed Nuts® for mounting screw type Side Panels
Screw fastened Flush Side Panels for Vertical Rack and Sloped Front Cabinets mount in the recess of the frame side. They are fastened from inside of the frame by 10BA x 23/32" Phillips Head sheet metal screws, Part 286:005:004 and Speed Nuts®, Part 285:004:005. The screws are zinc plated; the Speed Nuts are painted an aluminum finish.

Challenger Panel Mounting Angles

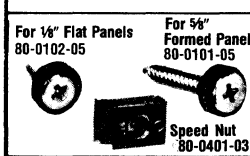
The Panel Mounting Angles are formed of 11 gauge cold rolled steel with 9/32" diameter holes spaced to comply with the Universal E.I.A. Standard RS-310. Tapped Panel Mounting Angles are tapped on one leg only. Additional Hardware can be ordered as needed.



ZINC PLATED PANEL MOUNTING ANGLES

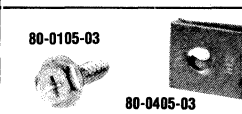
HEIGHT OF PANEL OPENING	PERFORATED PART NUMBER	TAPPED PART NUMBER
17½"	01-0701-02	01-1702-02
19¼"	01-1901-02	01-1902-02
21"	01-2101-02	01-2102-02
22¾"	01-2201-02	01-2202-02
35"	01-3501-02	01-3502-02
52½"	01-5201-02	01-5202-02
61¼"	01-6101-02	01-6102-02
70"	01-7001-02	01-7002-02
78¾"	01-7801-02	01-7802-02

Challenger and Quiptron Hardware

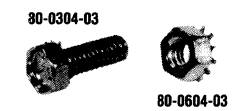


Mar-Proof Screws and Speed Nuts® for mounting flat or ⅝" formed instrument panels
Phillips Head sheet metal screws, with recessed Mar-Proof* black nylon washers, and Speed Nuts® are used to fasten Instrument Panels to punched Panel Mounting Angles. 10B x 1⅛" is used with ⅝" formed panels; screw 10B x ⅝" is used with flat panels. Screws are nickel plated, Speed Nuts® are painted an aluminum finish.

Mar-Proof machine screws for mounting flat or ⅝" formed Instrument Panels to Tapped Panel Mounting Angles
If tapped Panel Mounting Angles have been substituted for punched angles, the ⅛" Flat or ⅝" Formed Instrument Panel are fastened to the mounting angles with machine screws. These are 10-32 x 1" Phillips Head, used with a Mar-Proof* recessed black nylon washer. They are nickel plated.



Screws and Speed Nuts® for mounting Panel Mounting Angle
The Panel Mounting Angles are fastened to all Vertical Rack and Sloped Front Cabinet frames with 10B x 23/32" Phillips Head sheet metal screws, and Speed Nuts®. The screws are zinc plated; the Speed Nuts® are painted an aluminum finish.



Machine screws and nuts for joining frames side-by-side
When joining frames in Multiple Bays use ¼-20 x ¾" Hex Head Sems machine screws, and ¼-20 Hex Keps nuts. The screws and the nuts are zinc plated.

*Originated by EQUIPTO Electronic Corp. Engineers

© Equipto Electronics Corp. 351 Woodlawn Ave. Aurora, IL 60506-9988 (708) 897-4691 FAX (708) 897-5314

EQUIPTO® Electronics Corporation

© QUICK-ORDER/QUOTE FORM

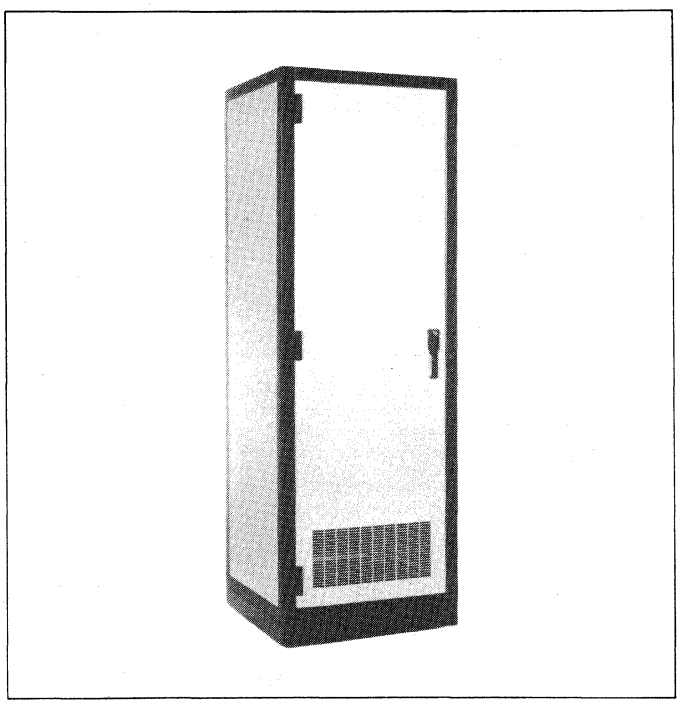
351 WOODLAWN AVENUE
AURORA, IL 60506-9988

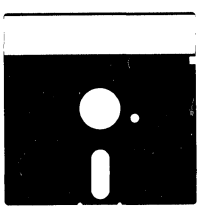
ORDERING ASSISTANCE (708) 897-4691
FAX (708) 897-5314

Heavy Duty Cabinets

5 week shipping schedule for assemblies and accessories shown on the next two pages.

Please call for complete information on our other product lines.





Phone for FREE IBM PC compatible Electronic Enclosure Design Program

This simplified order form is provided to make the gathering of information easy. Once completely filled out, it will make pricing and order entry simple and eliminate costly errors and oversights.

To complete this form, do the following:

1. Choose the frame required by checking off proper dimensions.
2. Determine if a single, or multiple bay console. If a multi-bay needs wedge frames, check proper degree of angle.
3. Determine the treatment of all openings in frame, checking off the multiple choices.
4. Determine the type of base required and options.
5. Check off the accessories required and if to be mounted in a specific location, use the drawing provided to sketch in item and the dimensions for its location.
6. Choose the way the cabinet is to be painted. If a special color is required, be sure to furnish a paint chip or 595 color number. If a special plastic laminate is required, advise color number.
7. Complete Company/Specifiers information and Fax or mail to Equipto Electronics Corporation.

HDEO-88

To Fax or mail, please photocopy this page.

EQUIPTO ELECTRONICS CORPORATION
HEAVY DUTY VERTICAL RACK SPECIFICATION FORM

☐ SINGLE BAY

1 2 3 4 5

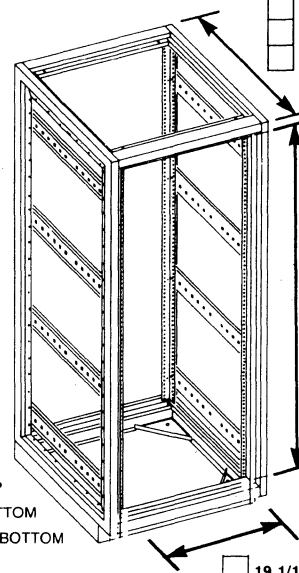
___ BAYS

☐ MULTIPLE BAYS IN LINE

___ BAYS ___ BAYS ___ BAYS

☐ MULTIPLE BAYS ANGULAR DESIGN

☐ 30°
☐ 45°
☐ 60°



OVERALL FRAME DEPTH
☐ 17 1/16" (1)
☐ 24 1/16"
☐ 29 1/16"
☐ 36 1/16"
☐ _____ (2)

VERT. PANEL HEIGHT (3)
☐ 21 1/8"
☐ 28 1/8"
☐ 35 1/8"
☐ 42 1/8"
☐ 49 1/8"
☐ 56 1/8"
☐ 63 1/8"
☐ 70 1/8"
☐ 77 1/8"
☐ 84 1/8"
☐ _____ (2)

☐ 19 1/16"
☐ 24 1/16"
☐ 30 1/16"
PANEL WIDTH

BAY 1 BAY 2 BAY 3 BAY 4 BAY 5

TOP PANEL
- ☐ NOT REQUIRED
- ☐ SCREW FASTENED
- ☐ LATCH FASTENED
- ☐ PLAIN
- ☐ LOUVERED
- ☐ GRILLED
- ☐ GRILED WITH FILTER
- ☐ FAN CFM_____☐ INTAKE ☐ EXHAUST
- ☐ LIFT EYE BOLTS
- ☐ LOCKS FOR LATCHES
- ☐ PLASTIC LAMINATE (SPECIFY COLOR)

BOTTOM PANEL
- ☐ NOT REQUIRED
- ☐ PLAIN
- ☐ GRILLED
- ☐ GRILLED WITH FILTER

FRONT PANEL OR DOOR
- ☐ NOT REQUIRED
- ☐ SCREW FASTENED PANEL
- ☐ LATCH FASTENED PANEL
- ☐ LEFT HAND DOOR
- ☐ RIGHT HAND DOOR
- ☐ PLAIN
- ☐ LOUVERED AT TOP
- ☐ LOUVERED AT BOTTOM
- ☐ LOUVERED TOP & BOTTOM
- ☐ LOUVERED FULLY
- ☐ GRILLED AT TOP
- ☐ GRILLED AT BOTTOM
- ☐ GRILLED AT TOP & BOTTOM
- ☐ ACRYLIC DOOR (BRONZE TINT) ☐ LH ☐ RH
- ☐ BLOWER CFM _____TYPE OF DISCHARGE_____
- ☐ FILTER REQUIRED FOR GRILL
- ☐ LOCKS FOR LATCHES
- ☐ STEEL WORK SHELF, INSERT PANEL ☐ STEEL ☐ LAMINATE
- ☐ LAMINATED WORK SHELF (SPECIFY COLOR)

REAR PANEL OR DOOR
- ☐ NOT REQUIRED
- ☐ SCREW FASTENED PANEL
- ☐ LATCH FASTENED PANEL
- ☐ LEFT HAND DOOR
- ☐ RIGHT HAND DOOR
- ☐ PLAIN
- ☐ LOUVERED AT TOP
- ☐ LOUVERED AT BOTTOM
- ☐ LOUVERED TOP & BOTTOM
- ☐ LOUVERED FULLY
- ☐ GRILLED AT TOP
- ☐ GRILLED AT BOTTOM
- ☐ GRILLED AT TOP & BOTTOM
- ☐ ACRYLIC DOOR (BRONZE TINT) ☐ LH ☐ RH
- ☐ BLOWER CFM _____TYPE OF DISCHARGE_____
- ☐ FILTER REQUIRED FOR GRILL
- ☐ LOCKS FOR LATCHES

BAY 1 BAY 2 BAY 3 BAY 4 BAY 5

LEFT SIDE PANEL
- ☐ NOT REQUIRED
- ☐ SCREW FASTENED
- ☐ LATCH FASTENED
- ☐ HINGED LEFT
- ☐ HINGED RIGHT
- ☐ PLAIN
- ☐ LOUVERED AT TOP
- ☐ LOUVERED AT BOTTOM
- ☐ LOUVERED TOP & BOTTOM
- ☐ LOUVERED FULLY
- ☐ GRILLED AT TOP
- ☐ GRILLED AT BOTTOM
- ☐ GRILLED AT TOP & BOTTOM
- ☐ FILTER REQUIRED FOR GRILL‡

RIGHT SIDE PANEL
- ☐ NOT REQUIRED
- ☐ SCREW FASTENED
- ☐ LATCH FASTENED
- ☐ HINGED LEFT
- ☐ HINGED RIGHT
- ☐ PLAIN
- ☐ LOUVERED AT TOP
- ☐ LOUVERED AT BOTTOM
- ☐ LOUVERED TOP & BOTTOM
- ☐ LOUVERED FULLY
- ☐ GRILLED AT TOP
- ☐ GRILLED AT BOTTOM
- ☐ GRILLED TOP & BOTTOM
- ☐ FILTER REQUIRED FOR GRILL‡

BASE
- ☐ WITHOUT BASE
- ☐ STANDARD RECESSED BASE
- ☐ FLUSH BASE
- ☐ CASTER BASE
- ☐ FLUSH TRUCK
- ☐ EXTENDED TRUCK
- ☐ FLUSH DOLLY
- ☐ EXTENDED DOLLY
- ☐ ANTI-TIP LEGS
- ☐ DUPLEX OUTLETS
- ☐ LEVELING GLIDES
- ☐ CASTERS FOR CASTER BASE
- ☐ CASTERS FOR TRUCK ☐ SELF LUBRICATING ☐ ROLLER BEARING
- ☐ ALL SWIVEL
- ☐ SWIVEL IN FRONT
- ☐ RIGID IN REAR
- ☐ FLOOR LOCKS
- ☐ CASTERS FOR DOLLY ☐ SELF LUBRICATING ☐ ROLLER BEARING
- ☐ ALL SWIVEL
- ☐ SWIVEL IN FRONT
- ☐ RIGID IN REAR
- ☐ LOCKING

(1) 17 1/16" deep frames are not available in heights over 49"

(2)

Vertical rack frame heights and depths are available in any increment of 1-3/4". Consult factory for details.

(3) To calculate overall height of frame add 5.25" to panel height. If base is ordered add another 3.50"

‡AVAILABLE ONLY ON LATCH OR HINGE TYPE PANELS

To Fax or mail, please photocopy this page.

HEAVY DUTY VERTICAL RACK SPECIFICATION FORM

ACCESSORIES

BAY 1	BAY 2	BAY 3	BAY 4	BAY 5	
☐	☐	☐	☐	☐	SLIDING SHELF ☐ PLAIN ☐ GRILLED
☐	☐	☐	☐	☐	BALL BEARING SLIDES
☐	☐	☐	☐	☐	GASKETING (DUST & MOISTURE) ☐ INSTALLED ☐ NOT INSTALLED
☐	☐	☐	☐	☐	JOINING CHANNEL (FOR FRONT TO BACK BAY ATTACHMENT)
☐	☐	☐	☐	☐	JOINING STUD (FOR SIDE BY SIDE BAY ATTACHMENT)
☐	☐	☐	☐	☐	MAR-PROOF SCREW FOR FLAT PANELS (QTY 10)
☐	☐	☐	☐	☐	MAR-PROOF SCREW FOR FORMED PANELS (QTY 10)
☐	☐	☐	☐	☐	SPEED NUT (QTY 10) FOR PANEL MOUNTING ANGLES
☐	☐	☐	☐	☐	TAPPED PANEL MOUNTING ANGLES (ORDER HARDWARE SEPARATELY)
☐	☐	☐	☐	☐	FLUSH DROP HANDLES
☐	☐	☐	☐	☐	WIRED PLUGMOLD
☐	☐	☐	☐	☐	ALUMINUM TRIM KIT ☐ PLAIN SATIN ☐ BLACK INSERT ☐ WALNUT INSERT
☐	☐	☐	☐	☐	PANEL MOUNTING ADAPTERS 19" WIDE FOR 24" OPENING
☐	☐	☐	☐	☐	PANEL MOUNTING ADAPTERS 23" WIDE FOR 24" OPENING
☐	☐	☐	☐	☐	GROUNDING BUS BAR

ACCESSORIES

BAY 1	BAY 2	BAY 3	BAY 4	BAY 5	
☐	☐	☐	☐	☐	PULL OUT SHELF
☐	☐	☐	☐	☐	HINGED DRAWER SHELF (FOR STORAGE OR EQUIPMENT DRAWERS)
☐	☐	☐	☐	☐	EQUIPMENT DRAWER ☐ FLUSH ☐ RECESSED HEIGHT _____" ☐ LATCH ☐ NON-LATCH
☐	☐	☐	☐	☐	STORAGE DRAWER HEIGHT _____"
☐	☐	☐	☐	☐	TURRET ☐ SINGLE SLOPE ☐ DOUBLE SLOPE
☐	☐	☐	☐	☐	FRONT SLOPE OPENING _____"
☐	☐	☐	☐	☐	FLUSH FILLER PANEL ☐ PLAIN ☐ LOUVERED ☐ GRILLED ☐ GRILLED W/FILTER HEIGHT _____"
☐	☐	☐	☐	☐	FORMED INSTRUMENT PANEL ☐ PLAIN ☐ LOUVERED ☐ GRILLED HEIGHT _____"
☐	☐	☐	☐	☐	FLAT INSTRUMENT PANELS ☐ STEEL ☐ ALUMINUM HEIGHT _____"
☐	☐	☐	☐	☐	PANEL SHIM HEIGHT _____"
☐	☐	☐	☐	☐	EQUIPMENT SHELF ☐ PLAIN ☐ GRILLED
☐	☐	☐	☐	☐	CHASSIS GUIDE

Semi-Gloss Smooth or Textured Standard Colors

MARK "X" FOR FRAME AND "O" FOR PANELS & DOORS

☐ TEXTURED (RECOMMENDED) ☐ SMOOTH

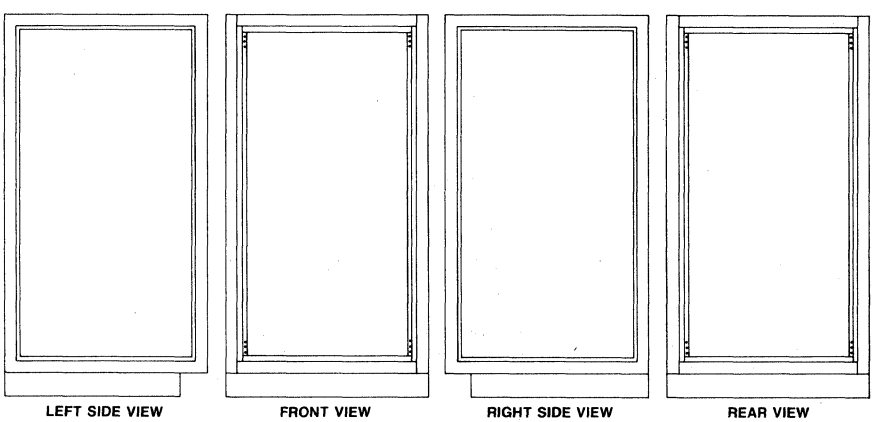
☐ 091 ANTIQUE WHITE	☐ 051 SATIN BLACK	☐ 101 ROYAL BLUE
☐ 041 DOVE GREY	☐ 021 RUSSET	☐ 118 DARK BLUE
☐ 013 LT. GREY	☐ 022 LT. BLUE	☐ 002 BEIGE
☐ 001 CHARCOAL GREY	☐ 117 SKY BLUE	☐ 120 DARK DROWN
☐ 595 COLOR NO. _____		☐ OTHER _____

Standard Colors for Laminated Tops

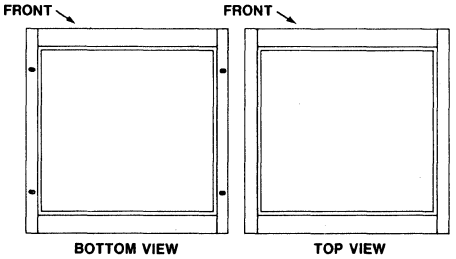
☐ 1 EGGSHELL	☐ 3 TEAK
☐ 2 WALNUT	☐ 4 STATIC CONTROL OFF-WHITE

☐ OTHER _____

The six view drawing is provided for you to sketch in location of accessory parts. If information is not provided we will mount or pack in the most convenient way for shipping purposes. If the customer can provide a drawing or sketch for assembly, please attach to this order form. If there is more than one bay use separate sheets, and label them bay 1, bay 2, etc.



LEFT SIDE VIEW | FRONT VIEW | RIGHT SIDE VIEW | REAR VIEW



BOTTOM VIEW (W/O BASE) | TOP VIEW (NOT SHOWN IN CORRECT ORIENTATION)

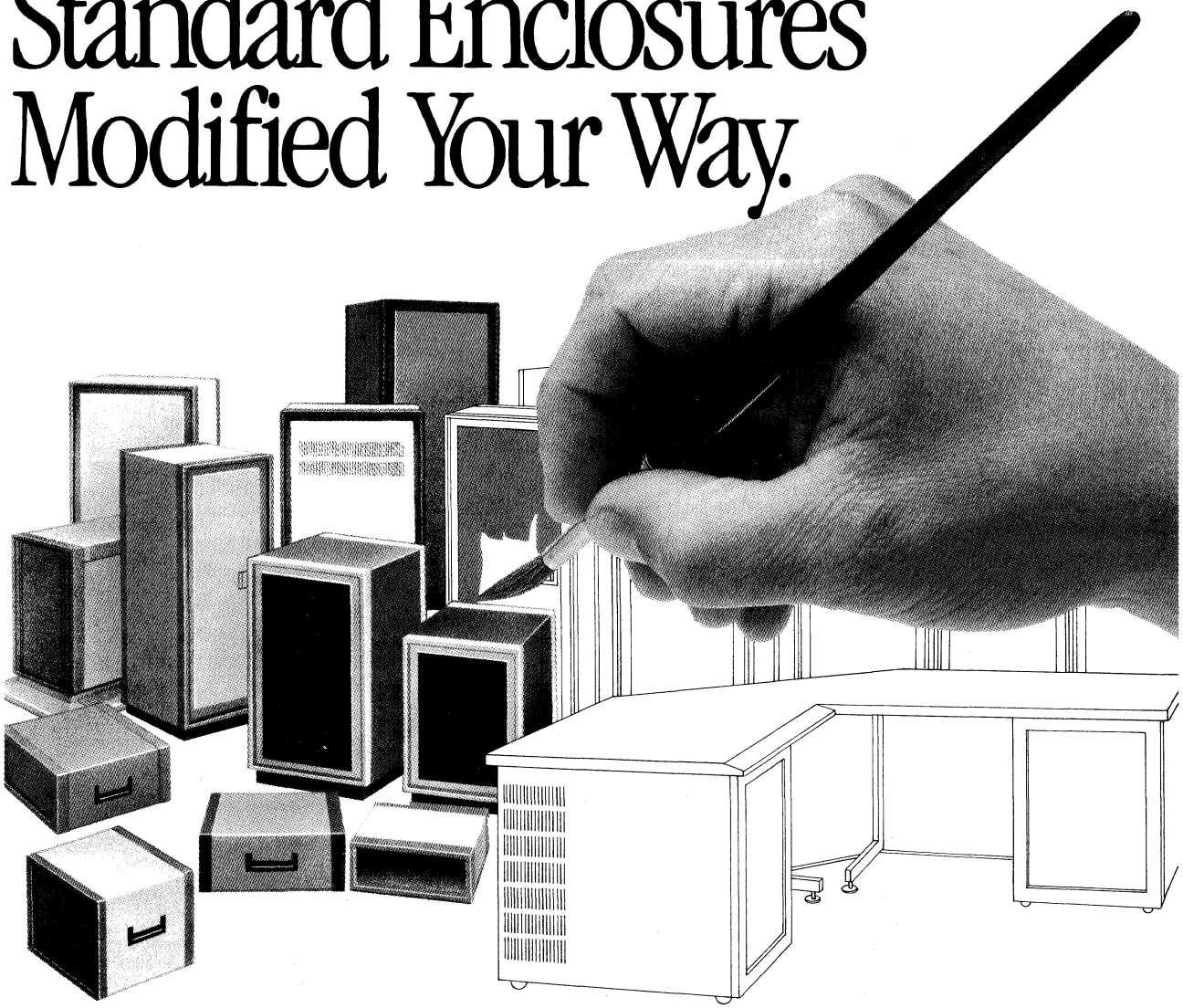
FAX: (708) 897-5314

Name _____
Company _____
Address* _____
City _____ State ___ Zip _____
Telephone ( ) _____
Fax ( ) _____

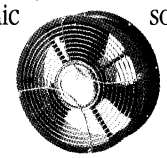
Quotation only requested _____
P.O. Number _____

*If shipping, billing or designer address is different, please provide that information on a separate cover sheet.

Imagine. Everest Standard Enclosures Modified Your Way.

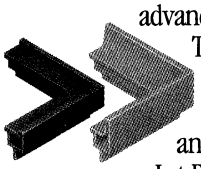


Now, Everest gives you the artistic freedom to specify cabinets, desks and cases that not only house and protect your electronic equipment, but also carry a distinct and personalized look that is all your own.



Just let your imagination go! From custom colors and trim to frame dimension changes, extra ventilation, FCC shielding, custom panels, chassis and brackets...your wish list can be unlimited.

Everest wants to provide the solution you need to get your product to market faster and at a lower cost. We even offer free engineering assistance during the design stage of your new product development programs.



Everest capabilities are virtually unmatched. Our plants are equipped with CAD/CAM systems and the most advanced manufacturing equipment. These resources are your assurance of high quality products, on-time deliveries and very competitive prices.

Let Everest take your concept and turn it into a reality. Call us today for details—and also ask about what's immediately available through our In-Stock Program.

Everest Electronic Equipment, Inc.
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(714) 634-2200 FAX (714) 634-1369
1800-G MacLeod Drive, Lawrenceville, Georgia 30243
(404) 995-8688 FAX (404) 995-9371

INDUSTRY STANDARD CASES

HEAVY DUTY TRANSIT CASE

MODEL*	W	L	H1	H2	A	B	C	D	E	F	AVAILABLE FOR WHEEL & HANDLE
GH0715RP-2	7-3/16	15-1/16	2-1/8 to 3-1/4 4 to 5-1/8	2-1/8 to 3-1/4 4 to 5-1/8	6	13-5/8	5-3/4	13-3/4	3/4	3/4	
GH0818RP-2	8-3/4	18-7/8	4-3/8 to 7	4-3/8 to 7	6-3/4	16-3/4	6-3/4	16-3/4	3/4	3/4	
GH0912RP-1	9	12-1/2	4 to 5	4 to 5	7-1/4	11	7-1/4	11	3/4	3/4	
GH1218RP-2	12-15/16	18-1/8	2-1/4 to 3-11/16	2-1/4 to 3-11/16	11-3/4	17	11-3/4	17	3/4	3/4	
GH1219RP-2	12-1/16	19-13/16	2 to 4	2 to 4	11-1/4	18-3/4	11-1/4	18-3/4	3/4	3/4	
GH1313RP-1	13-5/16	13-7/8	4-3/8 to 5-1/4	4-3/8 to 5-1/4	11-7/8	12-3/8	11-7/8	12-3/8	3/4	3/4	
GH1314RP-2	14-7/16	13-7/8	3-1/8 to 4 6-1/4 to 6-3/4	3-1/8 to 4 4-1/4 to 6-3/4	13-7/8	13-1/4	13-1/8	12-1/2	3/4	3/4	
GH1317RP-2	13-3/4	17	3-1/4 to 4	3-1/4 to 4	12-1/8	15-3/4	12-1/8	15-3/4	3/4	3/4	
GH1319RP-1	13	19-3/8	3-7/8 to 5	3-7/8 to 5	11-3/4	18	11-3/4	18	3/4	3/4	
GH1330RP-2	13-7/8	30-7/8	4 to 6-7/16	4 to 6-7/16	12-1/4	29-3/8	12-1/4	29-3/8	3/4	3/4	X
GH1419RP-2	14	19-7/16	3-1/4 to 3-3/4 4-1/4 to 6 7-5/8 to 9-3/4	3-1/4 to 3-3/4 4-1/4 to 6 7-5/8 to 9-3/4	12	17-1/2	12	17-1/2	3/4	3/4	
GH1420RP-2	14	20	4 to 5-1/2	4 to 5-1/2	12-1/2	18-1/2	12-1/2	18-1/2	3/4	3/4	
GH1423RP-2	14-7/16	23-3/4	4-3/16 to 6-5/16	4-3/16 to 6-5/16	13	22-3/8	13	22-3/8	3/4	3/4	X
GH1617RP-2	16-1/2	17-3/4	3-1/8 to 4-3/8 6-1/8 to 8	3-1/8 to 4-3/8 6-1/8 to 8	15	16-3/8	15-1/4	16-1/2	3/4	3/4	
GH1622RP-2	16-1/2	22-3/8	3-1/2 to 4 4-1/2 to 5-3/4 6-1/4 to 8-5/16	3-1/2 to 4 4-1/2 to 5-3/4 6-1/4 to 8-5/16	14-7/8	21-1/4	14-7/8	21-1/4	3/4	3/4	
GH1624RP-2	16-3/8	24-3/4	3-3/4 to 4-15/16	3-3/4 to 4-15/16	15-1/2	24-1/4	15-1/2	24-1/4	3/4	3/4	X
GH1727RP-2	17-13/16	27-3/4	3-3/4 to 4-1/2 5-1/2 to 7	3-3/4 to 4-1/2 5-1/2 to 7	16-1/4	26-1/2	16-1/4	26-1/2	3/4	3/4	X
GH1823RP-2	18-1/8	23-7/8	3-3/4 to 5-3/8 5-1/2 to 7-1/2	3-3/4 to 5-3/8 5-1/2 to 7-1/2	16-1/4	22-1/2	16-1/4	22-1/2	3/4	3/4	X
GH2020RP-2	20-13/16	20-13/16	4-1/2 to 5	4-1/2 to 5	19-1/4	19-1/4	19-1/4	19-1/4	3/4	3/4	
GH2122RP-2	21-3/16	22-5/8	2 to 3	2 to 3	19-5/8	21	19-5/8	21	3/4	3/4	
GH2325RP-2	23	25	5-1/4 to 7-3/16	5-1/4 to 7-3/16	21-1/4	23-1/4	21-1/4	23-1/4	3/4	3/4	X
GH2530RP-2	25-1/8	30-1/8	5-1/4 to 7	5-1/4 to 7	23	28	23	28	3/4	3/4	X

X-STACKING TRANSIT CASE

MODEL*	W	L	H1	H2	A	B	C	D	E	F
GH1021RP-X	10-1/2	21	2-3/4 to 3-13/16	2-3/4 to 3-13/16	8-15/16	19-7/16	8-15/16	19-7/16	3/4	3/4
GH1417RP-X	14-1/2	17	2-3/4 to 5-1/4	2-3/4 to 5-1/4	12-15/16	15-7/16	12-15/16	15-7/16	3/4	3/4
GH1717RP-X	17	17-1/2	3-to 3-7/8	3-to 3-7/8	15-7/16	15-15/16	15-7/16	15-15/16	3/4	3/4
GH1823RP-X	18-1/8	23-7/8	3-3/4 to 5-3/8 5-1/2 to 7-3/4	3-3/4 to 5-3/8 5-1/2 to 7-3/4	16-1/4	22-1/2	16-1/4	22-1/2	3/4	3/4
GH1921RP-X	19-1/8	21	3-1/4 to 4-3/8 5-1/4 to 6-5/8	3-1/4 to 4-3/8 5-1/4 to 6-5/8	17-1/2	19-1/2	17-1/2	19-1/2	3/4	3/4
GH1927RP-X	19	27	3 to 3-3/4 6-5/8 to 7-7/8	3 to 3-3/4 6-5/8 to 7-7/8	17-7/16	25-7/16	17-7/16	25-7/16	3/4	3/4
GH2325RP-X	23	25	5-1/4 to 7-3/16	5-1/4 to 7-3/16	21-1/4	23-1/4	21-1/4	23-1/4	3/4	3/4

HEAVY DUTY CARRYING CASE

MODEL*	W	L	H1	H2	A	B	C	D	E	F
GH0511R-1	5-7/8	11-3/8	3 to 3-3/4 7-1/4 to 8	3 to 3-3/4 7-1/4 to 8	4-7/8	10-1/4	4-3/8	10	3/4	3/4
GH0617R-1	6-1/8	17-1/8	2-5/8 to 2-15/16	2-5/8 to 2-15/16	4-3/4	15-3/8	5-3/8	16-3/8	3/4	5/8
GH0710R-1	7-1/2	10	3-1/8 to 3-3/8 4-3/16 to 5-3/8	3-1/8 to 3-3/8 4-3/16 to 5-3/8	6-1/2	8-3/4	6-1/4	8-5/8	3/4	1/2
GH0813R-2	8-5/8	13-7/8	2-3/4 to 3-1/4 5-1/2 to 6-1/2	2-3/4 to 3-1/4 5-1/2 to 6-1/2	6-15/16	12	6-15/16	12	3/4	5/8
GH0814R-2	8-11/16	14	4 to 5-1/16	4 to 5-1/16	7-1/4	12-1/2	7-1/4	12-1/2	7/8	3/4
GH0830R-1	8-13/16	30-11/16	1-1/4 to 2-3/4	1-1/4 to 2-3/4	8-1/4	30-1/4	8-1/4	30-1/4	3/4	1/2
GH0909R-1	9-7/8	9-7/8	2-11/16 to 3-9/16	2-11/16 to 3-9/16	8-5/16	8-5/16	8-5/16	8-5/16	3/4	5/8
GH0912R-1	9-1/16	12-1/16	1-1/2 to 1-3/4 3-1/4 to 3-3/4	3-1/4 to 3-3/4 7 to 7-13/16	8-1/4	11-1/2	6-1/4	9-1/2	3/4	1-1/4B
GH0914R-1	9-1/4	14	2-1/2 to 2-3/4, 3-1/2 to 6, 6-7/16 to 7-3/8	2-1/2 to 2-3/4, 3-1/2 to 6, 6-7/16 to 7-3/8	8-1/4	12-3/4	7-1/2	12-1/4	3/4	1/2T 3/4
GH0916R-1	9 3/4	16-13/16	1-3/4 to 2-11/16 7-3/4 to 10-3/4	1-3/4 to 2-11/16 7-3/4 to 10-3/4	9	16-3/8	8	15-1/4	3/4	3/4
GH0918R-1	9	18-15/16	2-1/2 to 3-1/2 8-13/16 to 9-9/16	2-1/2 to 3-1/2 8-13/16 to 9-9/16	7-7/8	18	7-1/2	17-3/8	3/4	3/4
GH0922R-1	9 5/8	22-11/16	2 to 3-1/16	2 to 3-1/16 6-5/8 to 10-1/2	8-3/8	21-1/8	8-1/4	21	3/4	3/4
GH0942R-1	9	42-5/8	1-1/4 to 2	1-1/4 to 2	8-3/8	41-3/4	8-3/8	41-3/4	3/4	1/2
GH1013R-1	10	13 1/8	2-3/4 to 3-1/2	2-3/4 to 3-1/2 9-3/4 to 10-1/2	8-1/2	11-3/4	7-3/4	11-1/4	3/4	3/4
GH1016R-1	10	16-1/16	1-3/4 to 2 7-1/4 to 9-3/8	1-3/4 to 2 7-1/4 to 9-3/8	9-1/4	15-1/4	8-1/4	14-1/4	3/4	1/2
GH1021R-1	10-1/4	21-15/16	4-3/8 to 5-1/4	4-3/8 to 5-1/4	9-1/8	20-1/2	9-1/8	20-1/2	3/4	3/4
GH1113R-1	11	13	2-1/4 to 2-3/4	2-1/4 to 2-3/4	10-1/8	12-1/8	10-1/8	12-1/8	3/4	1/2
GH1116R-2	11	16-1/2	2-5/8 to 3-15/16	2-5/8 to 3-15/16	10-1/2	16-1/16	10-1/2	16-1/16	3/4	1/2
GH1117R-2	11-5/8	17-1/2	2 to 3-1/4 3-1/2 to 4-3/4	2 to 3-1/4 3-1/2 to 4-3/4	10-3/8	16-1/2	10-3/8	16-1/2	3/4	3/4
GH1119R-1	11-5/16	19-5/16	2-3/16 to 3	2-3/16 to 3	10-5/8	18-1/2	10-5/8	18-1/2	3/4	3/4
GH1121R-2	11-7/16	20-15/16	3-1/16 to 4-1/16 6-5/8 to 8-13/16	3-1/16 to 4-1/16 6-5/8 to 8-13/16	10	19-1/2	10	19-1/2	3/4	3/4
GH1123R-2	11-11/16	23-3/4	1-1/4 to 2-1/4	1-1/4 to 2-1/4	11-1/4	23-3/8	11-1/4	23-3/8	3/4	1/4
GH1137R-2	11-7/8	37-3/4	1-1/4 to 2-1/4	1-1/4 to 2-1/4	11-11/16	37-3/4	11-11/16	37-3/4	3/4	1/4
GH1212R-2	12	12	3-9/16 to 4-1/4	3-9/16 to 4-1/4	10-5/8	10-5/8	10-5/8	10-5/8	3/4	5/8
GH1220R-2	12-7/16	20-5/16	3-1/8 to 4	3-1/8 to 4	11-3/4	19-3/4	11-3/4	19-3/4	1-1/32	1/4
GH1316R-1	13-13/16	16-13/16	2-5/16 to 3-1/8 3-5/8 to 6-1/4	2-5/16 to 3-1/8 3-5/8 to 6-1/4	12-13/16	15-3/4	12-5/8	15-1/2	3/4	3/4
GH1318R-2	13	18	3-9/16 to 5-1/4	3-9/16 to 5-1/4	11-5/8	16-1/2	11-5/8	16-1/2	3/4	1/2
GH1319R-2	13-13/16	19-3/4	2-3/4 to 3-5/8 7-1/4 to 8-1/8	2-3/4 to 3-5/8 7-1/4 to 8-1/8	11-1/2	17-1/4	11-1/2	17-1/4	3/4	5/8
GH1319R-2	13-7/8	19-5/8	3 to 3-3/4 4-3/4 to 6	3 to 3-3/4 4-3/4 to 6	12-5/8	18-1/4	12-5/8	18-1/4	3/4	1/2
GH1417M-1	14-7/8	17-3/4	3-3/4 to 5-3/16	3-3/4 to 5-3/16	14-1/8	17	14-1/8	17	M	45°
GH1419R-1	14-1/4	19-15/16	1-1/4 to 1-9/16 11-1/8 to 13-7/16	1-1/4 to 1-9/16 11-1/8 to 13-7/16	13-1/2	19-3/16	13-1/2	19-3/16	3/4	1/2
GH1444R-2	14-13/16	44-3/16	3-1/16 to 3-5/16	3-1/16 to 3-5/16	13-11/16	43-9/16	13-11/16	43-9/16	3/4	1/2
GH1523R-2	15-1/8	23-7/16	2-5/8 to 4-5/8 3-9/16 to 5-13/16	2-5/8 to 4-5/8 3-9/16 to 5-13/16	14	22-1/8	14	22-1/8	3/4	1/2
GH1528R-2	15-1/4	28-1/16	2-5/8 to 4-3/4 6-7/8 to 9-1/16	2-5/8 to 4-3/4 6-7/8 to 9-1/16	13-1/4	26-1/4	13	25-1/2	3/4	3/4
GH1631R-2	16	31	4-3/8 to 6-7/8	4-3/8 to 6-7/8	14-1/4	29-3/8	14-1/4	29-3/8	3/4	3/4
GH1733R-2	17-13/16	33-3/4	1-1/4 to 2-9/16	1-1/4 to 2-9/16	13-1/8	34-1/4	13-1/8	34-1/4	3/4	1/2
GH1820R-2	18	20	2 to 3-1/2	2 to 3-1/2	16-5/8	18-3/4	16-5/8	18-3/4	3/4	5/8
GH1825R-2	18	25-3/4	1-13/16 to 2-13/16 5-1/4 to 6-9/16	1-13/16 to 2-13/16 5-1/4 to 6-9/16	17	25-1/4	16-1/2	24-3/8	3/4	5/8
GH1828R-2	18-1/16	28-3/16	3-3/4 to 4-1/2 6-3/4 to 7-1/2	3-3/4 to 4-1/2 6-3/4 to 7-1/2	16-5/8	26-3/4	16-1/2	26-1/2	3/4	3/4
GH2121R-2	21-1/4	21-1/4	5-5/16 to 6-11/16	5-5/16 to 6-11/16	18-3/4	18-3/4	18-3/4	18-3/4	3/4	3/4
GH2131R-2	21	31	3 to 5	3 to 5	19-15/16	29-15/16	19-15/16	29-15/16	3/4	3/4
GH2639R-2	26-13/16	39-3/16	1-1/4 to 2-13/16 4-11/16 to 5-7/16	4-11/16 to 5-7/16	26	38-3/8	25-3/8	37-13/16	3/4	5/8

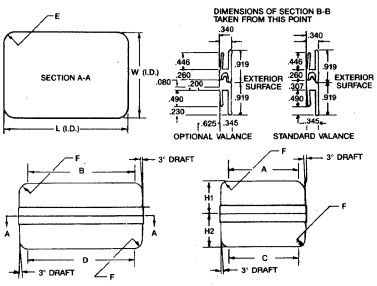
HEAVY DUTY RACK MOUNT CASE

MODEL	EIA STANDARD PANEL	W	L	A	B	C	D	E	F
GH0514M	—	5-5/16	14-3/16	12-3/4	12-5/16	—	—	14-3/8	5-9/16
GH0519M	5.219 x 19	5-5/16	19-1/4	18-5/16	17-7/8	2-1/4	—	19-1/4	5-7/16
GH0714M	—	6-15/16	13-11/16	12-3/4	12-5/16	—	—	13-11/16	7
GH0719M	6.969 x 19	7-1/16	19-1/4	18-5/16	17-7/8	4	—	19-1/4	7-1/4
GH0919M	8.719 x 19	8-13/16	19-1/4	18-5/16	17-7/8	5-3/4	—	18-7/8	8-7/16
GH1119M	10.469 x 19	10-9/16	19-1/4	18-5/16	17-7/8	2-1/4	3	19-1/4	10-3/4
GH1219M	12.219 x 19	12-5/16	19-1/4	18-5/16	17-7/8	3-1/2	2-1/4	19-1/4	12-1/2

Gemini specializes in custom designed cases for industry. We have the capability to design a case specifically for your product and follow through from prototypes to production. If you are currently purchasing a standard case from another manufacturer, we may be able to duplicate that case at a lower cost. We welcome the opportunity to quote on your case requirements and to work with you on design.

The above sizes are only a partial list, contact GEMINI for a complete catalog. **CALL TOLL FREE: 1-800-533-3631**

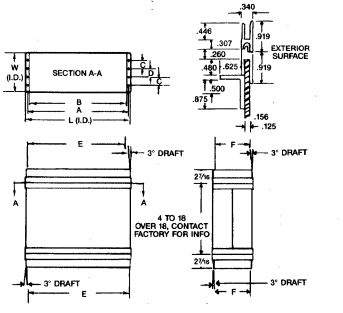
Gemini's standard line of **HEAVY DUTY TRANSIT CASES** are constructed from high density polyethylene, and extremely tough and resilient material ideally suited to the abuses transit cases are subjected to. The heavy wall (.100″ nominal) shells and heavy duty 1.838″ wide #6063 T52 aluminum valance combine to form a container capable of transporting delicate portable instruments under the most adverse conditions. Available with recessed wheels and folding handle.



Gemini's standard line of **HEAVY DUTY CARRYING CASES** are constructed from rugged A.B.S. and feature a heavy wall aluminum valance to provide an extremely rugged case with contemporary lines for transporting delicate portable instruments under the most demanding conditions.

Standard Features include:

- .100″ to .150″ nominal wall black A.B.S. shells
- variable case depth
- heavy wall 1.838″ wide #6063 T52 aluminum valance with dust seal
- choice of handle, latch, hinge and bumpers



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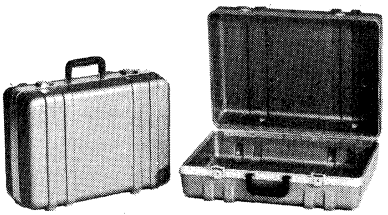
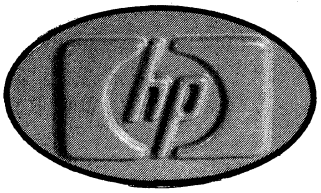
INCORPORATED
103 Mensing Way
Cannon Falls, MN 55009-0018
PHONE: (507) 263-3957 (In Minnesota)
FAX: (507) 263-4887

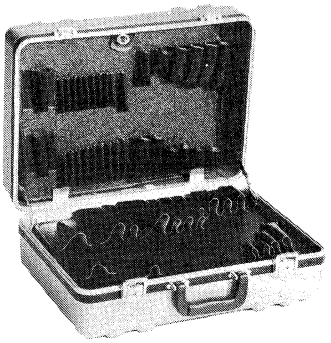
INDUSTRY STANDARD CASES



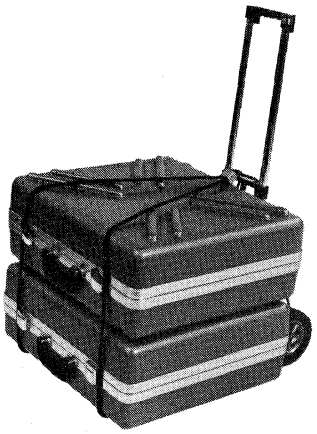
TRANSIT CASE



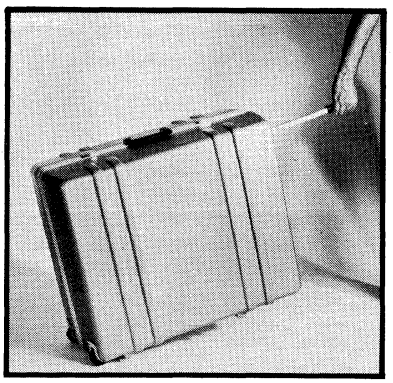
MOLDED LOGOS



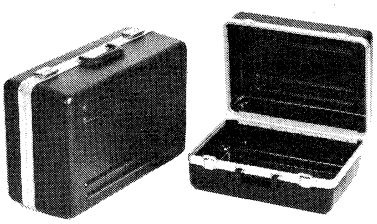
TOOL CASE



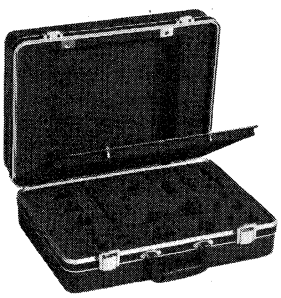
X-STACKING TRANSIT CASE & CART



WHEEL CASE

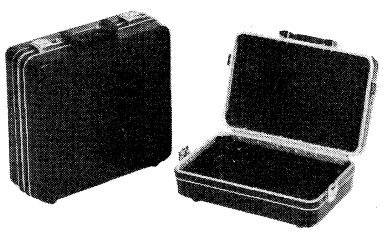


HEAVY DUTY CARRYING CASE

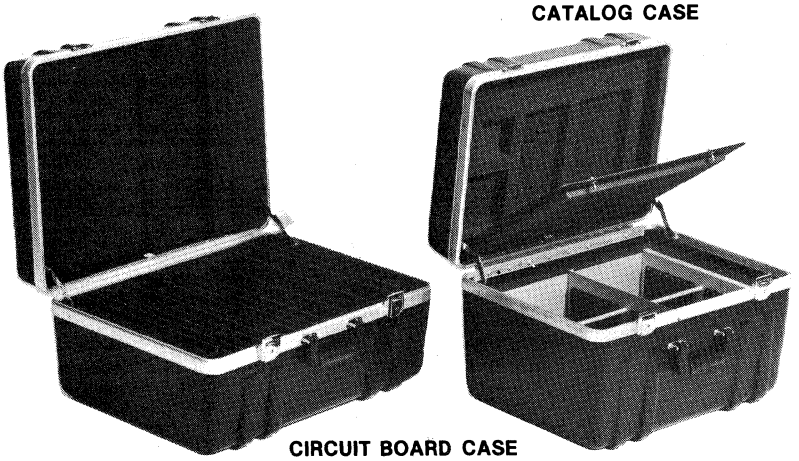


DOORS/HINGED DIVIDERS
DIE-CUT FOAM INSERTS

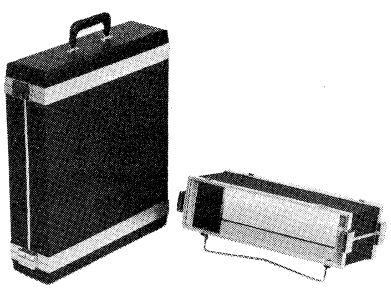
CATALOG CASE



ATTACHE STYLE CASE



CIRCUIT BOARD CASE



EIA RACK MOUNT CASE

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- Special hardware selections available
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- Special brackets
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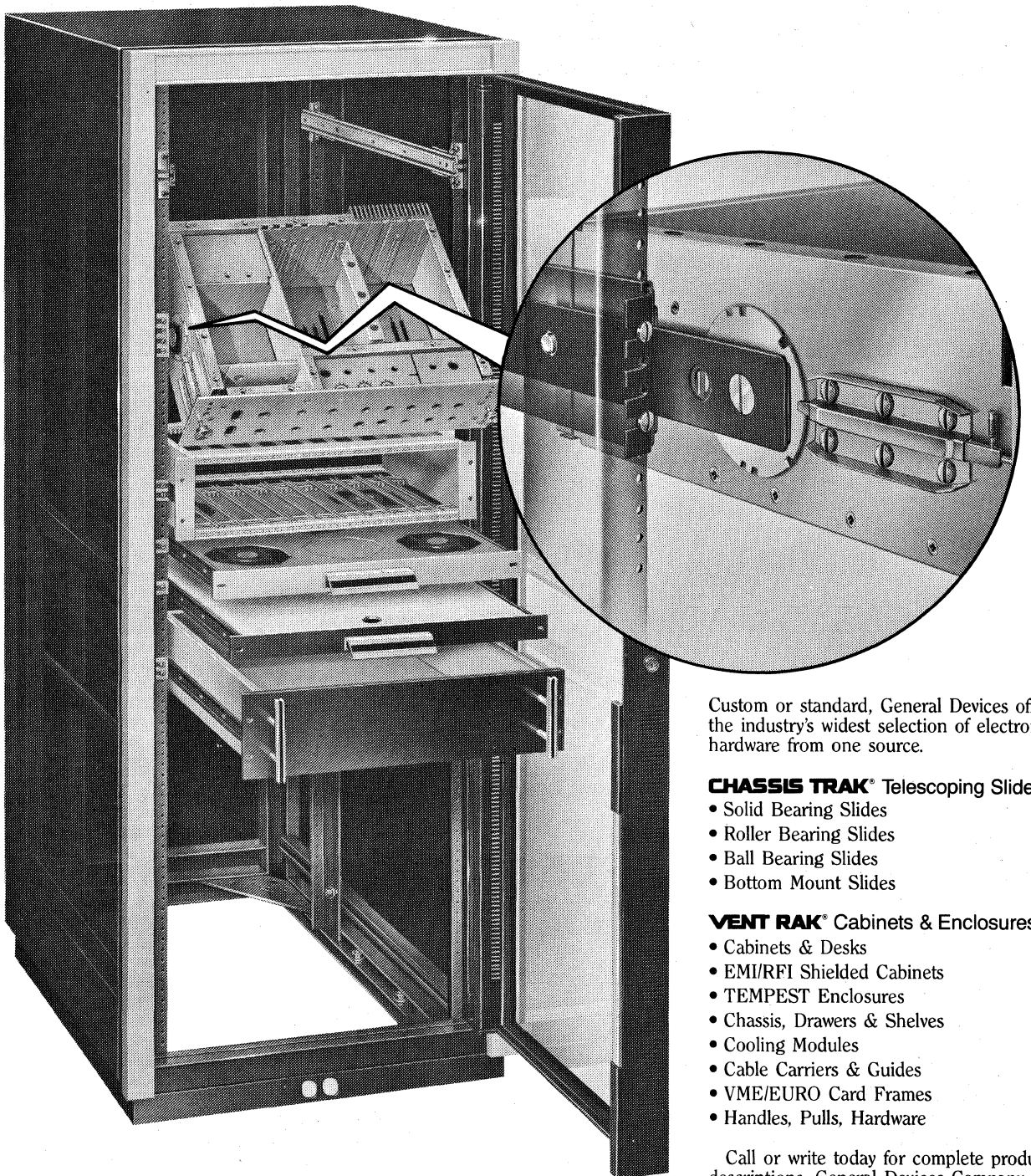

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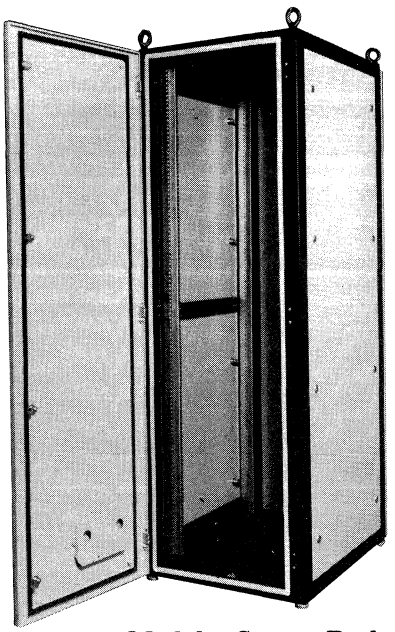
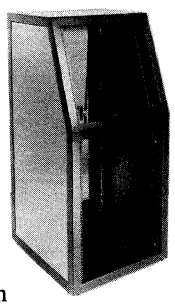
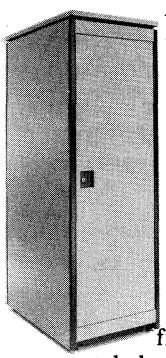
ABS Plastic Instrument Cases
- 4 sizes in 5 colors
- Flame retardant ABS plastic
- Integral P.C. mounting slots
- Two piece construction

NEMA 12 and NEMA 12 EMI/RFI Shielded Racks
- Oil and dust tight racks built to NEMA specifications
- 19″ or 24″ panel widths available in 9 heights (21″ to 77″ panel height)
- Two depths 24.5″ and 31.5″
- Cabinets are Gulf Blue or Sand with textured black frame
- A wide range of accessories are available



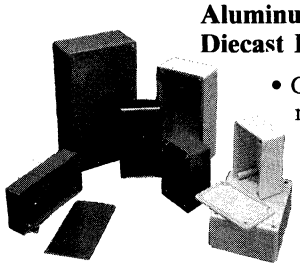


Console Racks
- 19″ or 24″ rack mount panel width
- 49″ overall height
- 24.5″ or 31.5″ deep
- Available in a wide range of colors
- Accessories include rack mount desks, front and rear doors and a wide range of universal accessories

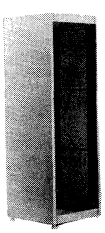


Modular System Racks
- 12 heights 21″ to 84″
- 19″ or 24″ panel widths
- 3 depths 17.5″, 24.5″ and 31.5″
- Available in a wide range of colors
- Accessories include ganging kits, wedge kits, front and rear doors, rack mount desks, tops, gang tops and a wide range of universal accessories

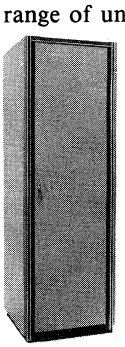
Plastic and Aluminum Diecast Boxes



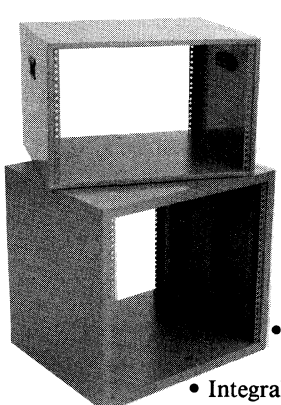
- Over 50 models to choose from
- ABS plastic cases
- Aluminum diecast cases
- ABS Plastic consoles
- EMI/RFI shielded plastic or metal cases
- Water tight metal cases
- Available in a wide variety of colors and finishes
- Custom punching and screening



Knockdown Economy Racks
- 4 piece construction
- 8 heights in two depths
- Accept most universal 19″ accessories
- Available in a wide range of colors

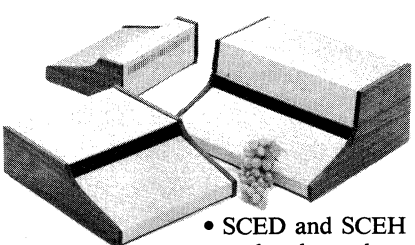


Heavy Duty Racks
- 19″ or 24″ panel widths
- 5 heights 49″ to 85″
- 3 depths 17.5″, 24.5″ or 31.5″
- Available in a wide range of colors
- Accessories include rack mount desks, ganging kits, variety of doors and side panels and a full range of universal accessories



19″ Panel Mount Rack Cases
- Panel heights 3.25″ to 28.0″
- Depths 13.5″ and 17.5″
- Available in a wide range of colors
- Many Universal 19″ Accessories
- Integral front and rear panel rails use 10-32 clipnuts for panel mounting

Desktop Cases and Consoles
- Hundreds of models in a wide range of colors and materials



- SCED and SCEH consoles shown here feature real walnut wood sides

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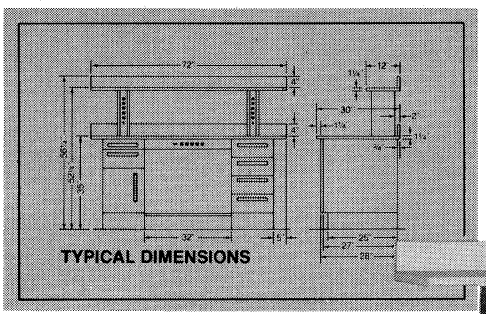

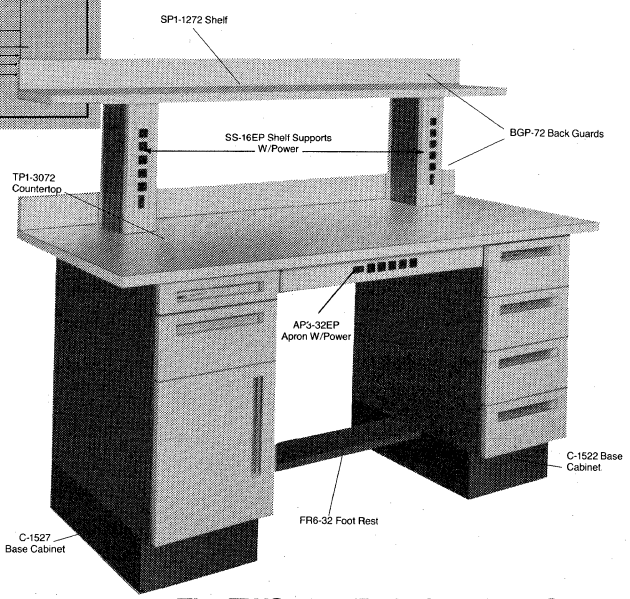

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LANSING

GrayBox™	Dimensions (inches)			Model Number
	Height	Width	Depth	
B-Series (screw-on covers) Clear Anodized Aluminum Finish	One Rack Unit 1.72	Half Rack 8.37	8.00	B1H08-001
			10.00	B1H10-001
			12.00	B1H12-001
			14.00	B1H14-001
			16.00	B1H16-001
			18.00	B1H18-001
			20.00	B1H20-001
			22.00	B1H22-001
		Full Rack 16.73	8.00	B1F08-001
			10.00	B1F10-001
			12.00	B1F12-001
			14.00	B1F14-001
			16.00	B1F16-001
			18.00	B1F18-001
			20.00	B1F20-001
			22.00	B1F22-001
	Two Rack Units 3.47	Half Rack 8.37	8.00	B2H08-001
			10.00	B2H10-001
			12.00	B2H12-001
			14.00	B2H14-001
			16.00	B2H16-001
			18.00	B2H18-001
			20.00	B2H20-001
			22.00	B2H22-001
		Full Rack 16.73	8.00	B2F08-001
			10.00	B2F10-001
			12.00	B2F12-001
			14.00	B2F14-001
			16.00	B2F16-001
			18.00	B2F18-001
			20.00	B2F20-001
			22.00	B2F22-001
	Three Rack Units 5.22	Half Rack 8.37	8.00	B3H08-001
			10.00	B3H10-001
			12.00	B3H12-001
			14.00	B3H14-001
			16.00	B3H16-001
			18.00	B3H18-001
			20.00	B3H20-001
			22.00	B3H22-001
		Full Rack 16.73	8.00	B3F08-001
			10.00	B3F10-001
			12.00	B3F12-001
			14.00	B3F14-001
			16.00	B3F16-001
			18.00	B3F18-001
			20.00	B3F20-001
			22.00	B3F22-001
P-Series (slide-in covers) Clear Anodized Aluminum Finish	One Rack Unit 1.72	Half Rack 8.37	8.00	P1H08-001
			10.00	P1H10-001
			12.00	P1H12-001
			14.00	P1H14-001
			16.00	P1H16-001
		Full Rack 16.73	8.00	P1F08-001
			10.00	P1F10-001
			12.00	P1F12-001
			14.00	P1F14-001
			16.00	P1F16-001

RACK MOUNTING KITS			
	1.72	With Handle	K1RMH-001
		Without Handle	K1RMX-001
	3.47	With Handle	K2RMH-001
		Without Handle	K2RMX-001
	5.22	With Handle	K3RMH-001
		Without Handle	K3RMX-001

MicroPak™	Dimensions (inches)			Model Number
	Width	Height	Depth	
MicroPak Q	4.17	1.52	5.45	Q1H50
			6.45	Q1H60
		2.52	5.45	Q2H50
			6.45	Q2H60
MicroPak T	5.57	1.52	5.45	T1H50
			6.45	T1H60
			7.45	T1H70
			8.95	T1H85
		2.52	5.45	T2H50
			6.45	T2H60
			7.45	T2H70
			8.95	T2H85
MicroPak W	7.29	1.52	9.45	W1H90
		2.52	9.45	W2H90
MicroPak S	5.75	1.52	8.38	S1H70
			9.93	S1H85

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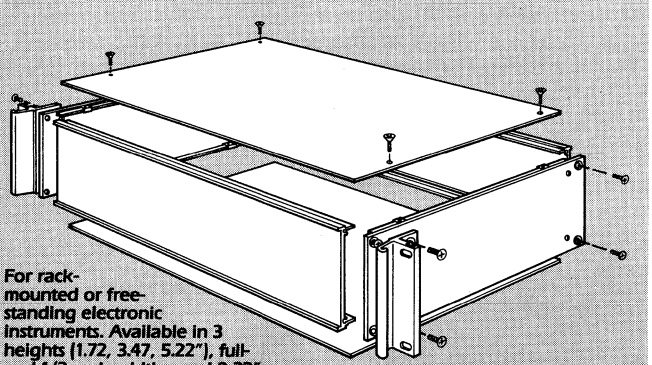

For rack-mounted or free-standing electronic instruments. Available in 3 heights (1.72, 3.47, 5.22"), full- and 1/2-rack widths, and 8-22" depths. Custom widths and depths are also available.

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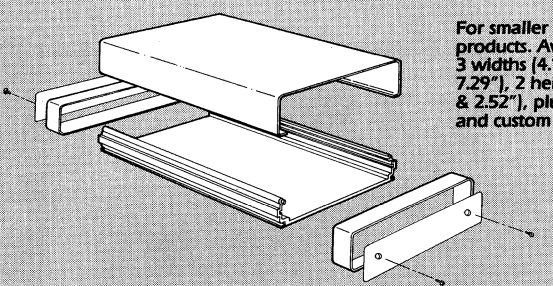

For smaller electronic products. Available in 3 widths (4.17, 5.57, 7.29"), 2 heights (1.52 & 2.52"), plus stock and custom depths.

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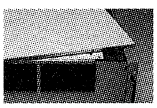
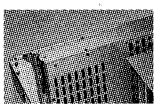
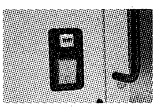


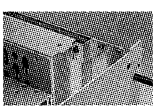
Top cover removable without having to remove front and rear panels



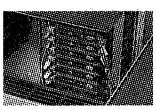
Positive-pressurized, filtered, plenumed air cooling allows different levels of cooling within the same enclosure



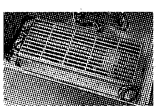
Illuminated power switch



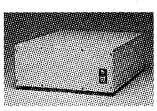
The entire cooling plenum may be detached by removing only two screws—Filter may be changed to assure a dust-free environment



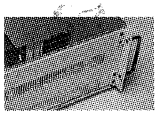
Backplane options to meet your needs



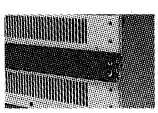
Choose from several different power options



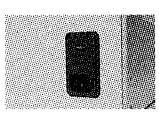
Rugged, lightweight aluminum with polyurethane-textured paint finish



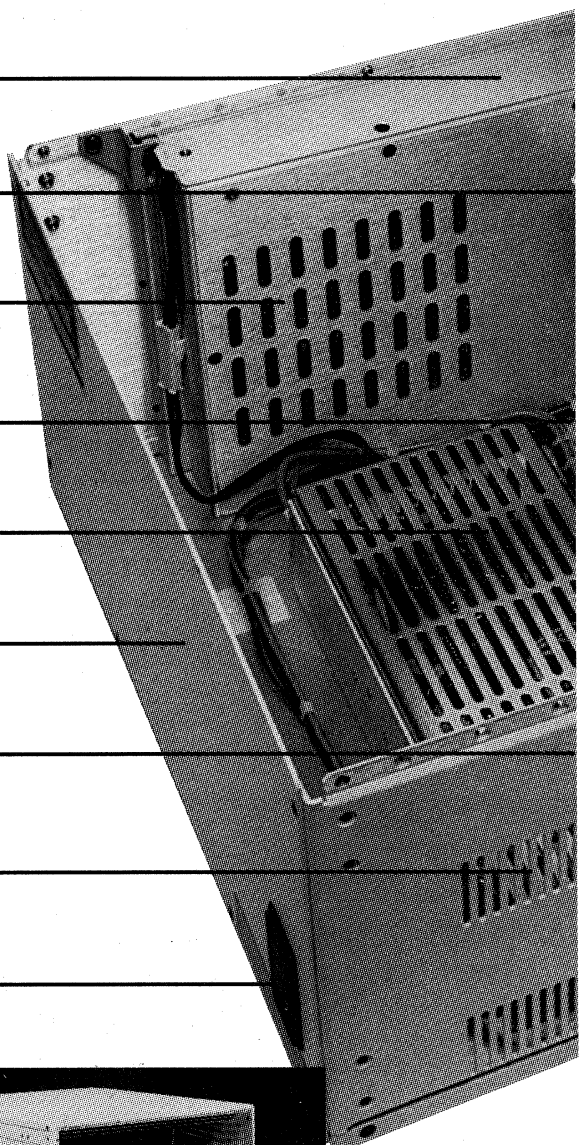
Desktop, rackmount, slidemount, EIA kit, or combination mounting options available

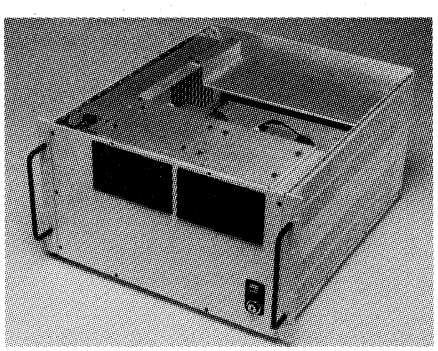


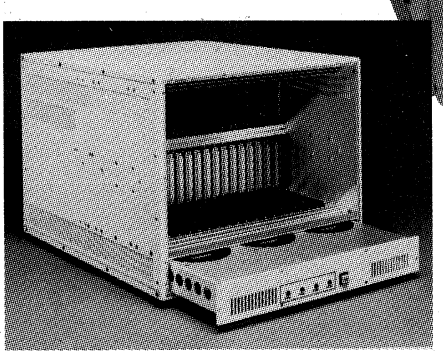
Airflow design allows for slide mounting without impeding cooling capabilities



Switch selectable 115VAC/ 230VAC







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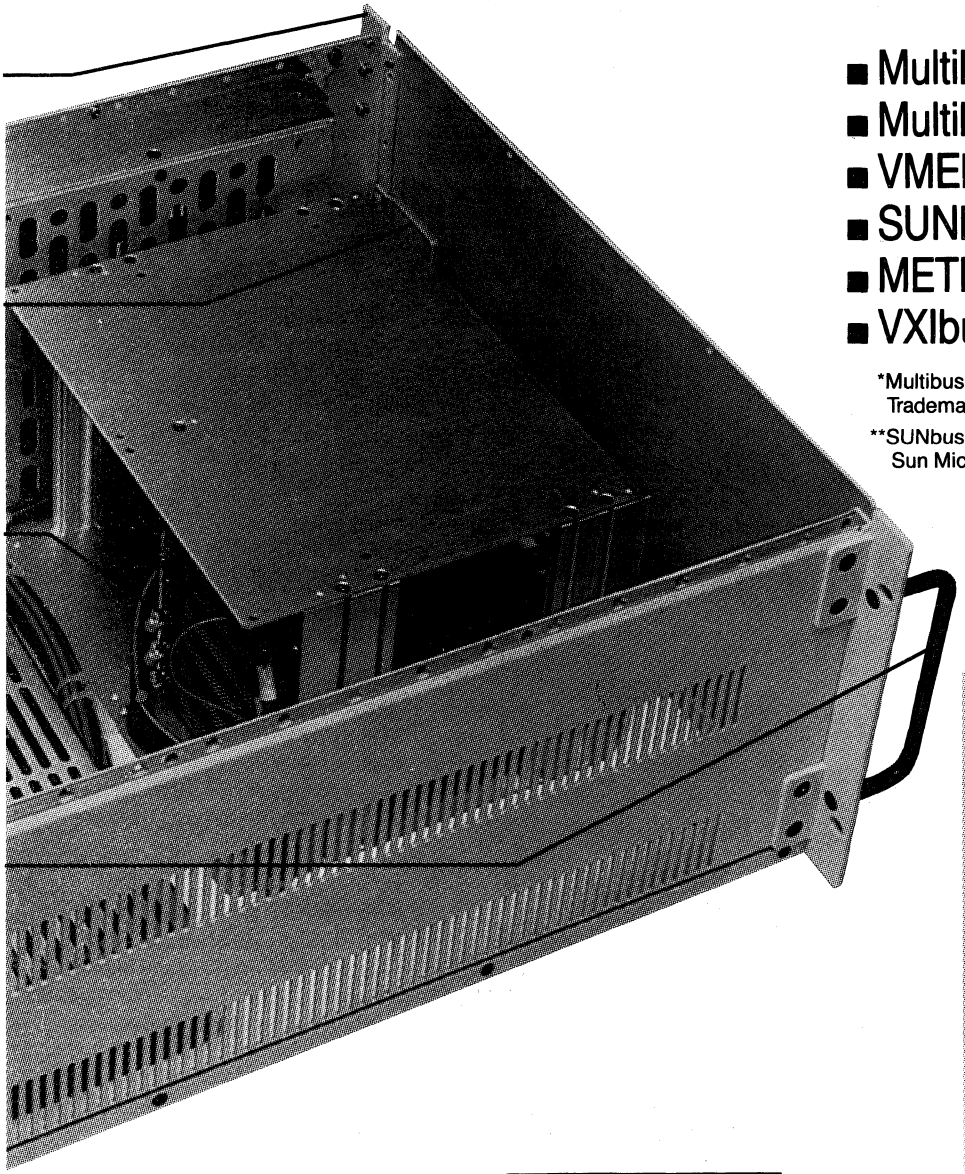

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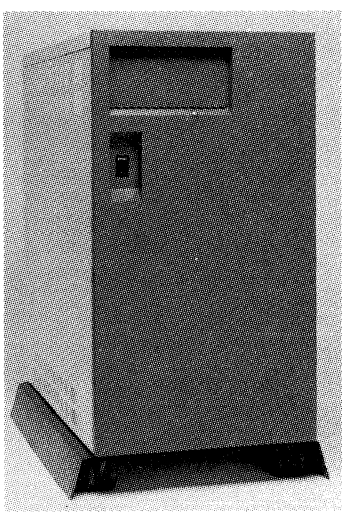

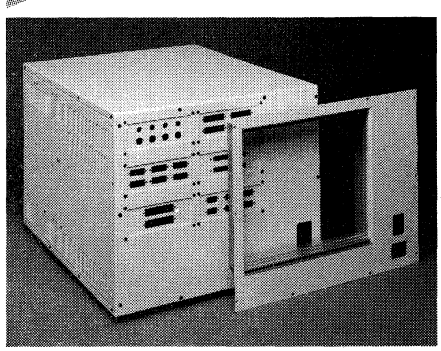

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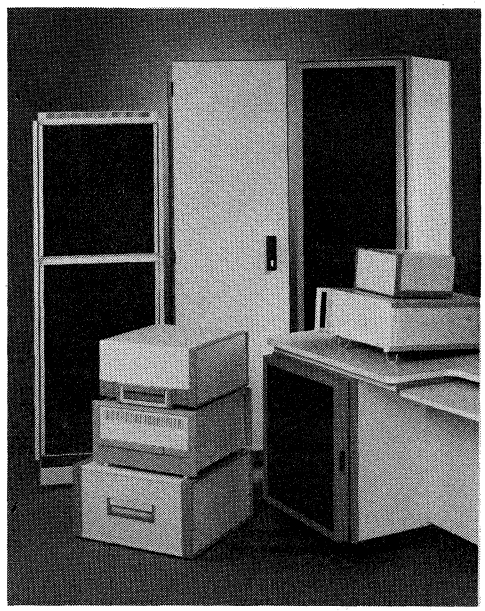

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- Instrument Cases for 19" and 17" Systems
- Electronic Desk Systems
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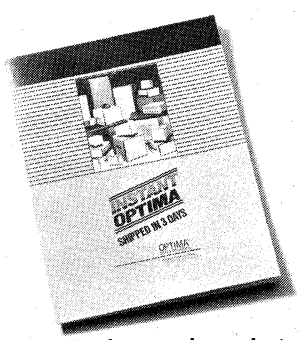

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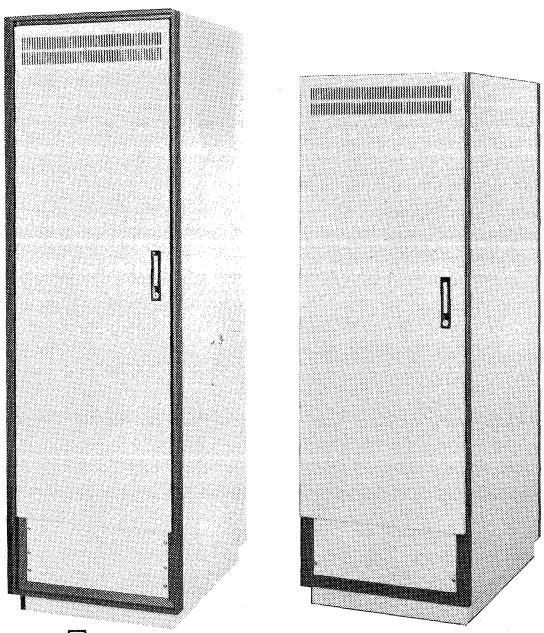
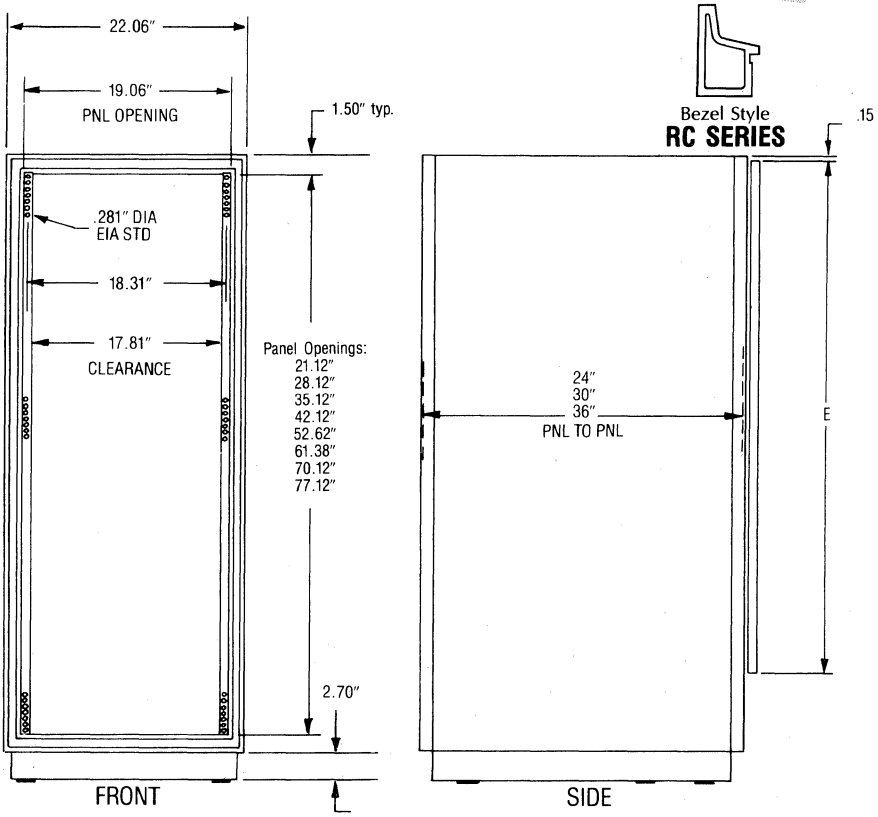
Optima offers two styles of vertical cabinets for 19" systems, the "RA Series" and the "RC Series." They differ only in appearance, with each providing superior strength-to-weight ratios along with a clean, professional look.

Vertical Cabinet features:

- Available in 48 sizes:
  Heights: 21, 28, 35, 42, 52, 61, 70, 77"
  Widths: 19, 24"
  Depths: 24, 30, 36"
- Basic frame features front and rear bezels of aluminum extrusions, joined by corner members.
- Side panels independent of the framework for ease of assembly and service.
- Extra strength framework withstands static loads in excess of 6,600 lbs.
- Steel bases with caster brackets and leveler provision.
- Acrylic latex textured finish.
- Superior paint adhesion through phosphate pre-treating.
- For more details and information re: standard colors, a broad selection of accessories and our INSTANT OPTIMA 3-day ship program call or send for FREE catalog.

OPTIMA® Enclosures





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RC SERIES

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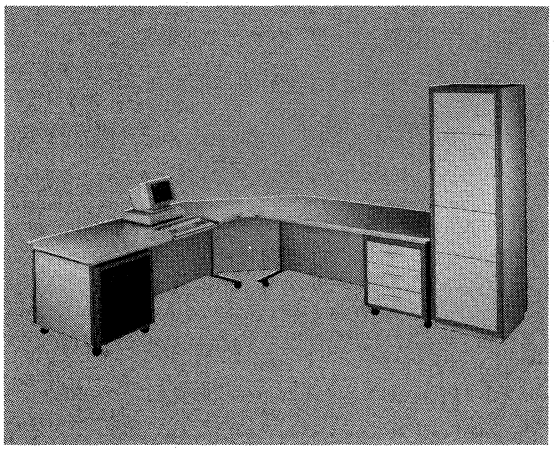
NEW OPTIMA ELECTRONIC DESK SYSTEM

Presenting Optima's new line of contemporary desk designs. Made to compliment today's office environments, and provide an integrated look to even the largest system.

Standard features include:

- Available in 3 sizes: Height: 28" Widths: 28, 50, 72" Depth: 32"
- Keyboard desktop version available; fits most standard keyboard sizes in recessed area.
- Optional operational pedestal; easily removed back panels provide quick access to electronic equipment mounting rails.
- Easy to move; uses attractive, heavy-duty, locking casters.
- Optima desks are available separately with a wide variety of accessories (multiple configurations also available).
- EMI/RFI shielded desks also available.
- For more details and information re: standard colors, a broad selection of accessories and our INSTANT OPTIMA 3-day ship program call or send for FREE catalog.

OPTIMA Enclosures



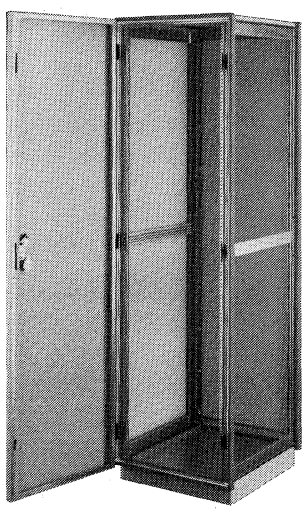
EMI/RFI SHIELDED CABINETS

Standard features include:

- Available in 48 sizes:
  Heights: 21, 28, 35, 42, 52, 61, 70, 77"
  Widths: 19, 24" Depths: 24, 30, 36"
- Beryllium copper gasketing for all seams and joints to insure continuous conductive path at panel/framework interfaces.
- Paint-free, electrical contact areas provided with clear chemical chromate conversion coating.
- Extra strength framework withstands static loads in excess of 6,600 lbs.
- Easy to remove (from inside) top, bottom and side panels of .062" aluminum alloy.
- Heavy gauge (.090") aluminum doors, front and rear.
- Tough, 3-point door latch mechanism for tighter, uniform fit, with easy handle operation.
- Adjustable panel mounting brackets.
- For more details and information re: standard colors, a broad selection of accessories and our INSTANT OPTIMA 3-day ship program call or send for FREE catalog.
- Shielded case also available – See Optima 19.

OPTIMA Enclosures

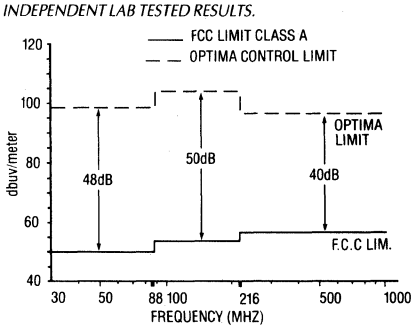
***MIL-SPEC CABINETS ALSO AVAILABLE**



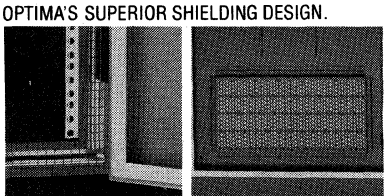
*Mil-Spec Cabinet not shown

E.M.I. CABINET ATTENTUATION

INDEPENDENT LAB TESTED RESULTS.



OPTIMA'S SUPERIOR SHIELDING DESIGN.



BeCu gasketing for all seams and joints.

Shielded ventilation provided by vents with plenum.

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Gichner

Optima® Enclosures

2166 Mountain Industrial Boulevard
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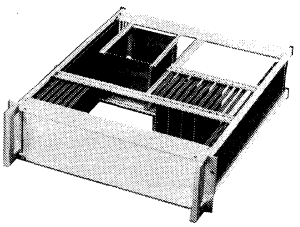
OPTIMA CASES

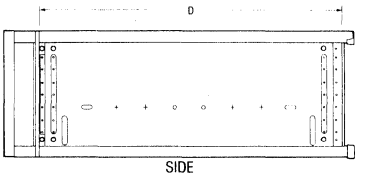
OPTIMA® Enclosures

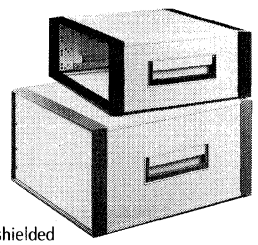


Rack Adaptable Kit

Optima Instrumate

- Available in 15 sizes:
  Panel Heights: 3.31", 5.06", 6.81", 8.56", 10.31".
  Width: 17" Depths: 16, 21, 23"
- Single solution to multiple application packaging.
- Use it as a chassis or a card cage, or both.
- Can be used as desk-top or rack-mounted unit.
- Each frame member has mounting holes for insertion of optional metalwork, card guides and card cages.
- Extra strength to accommodate 100 lbs. for components and subassemblies.
- Panel dividers and front panels available.
- Load from top, front or rear.
- Meets IEC/EIA standards.

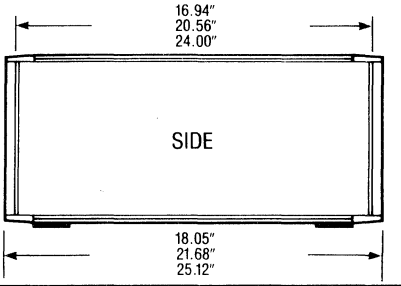


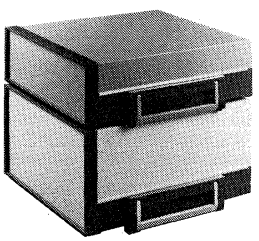


EMI/RFI shielded versions also available.

Optima 19" Instrument Cases

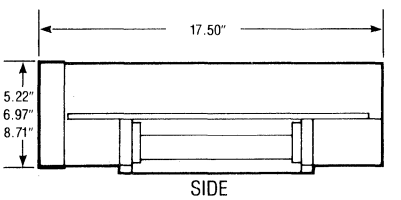
- Available in 45 sizes:
  Panel Heights: 15 available from 3½" to 28"
  Widths: 19" (24" by special order)
  Depths: 16, 20, 24"
- Structural strength achieved with rigid, welded aluminum bezels joined by rounded, extruded aluminum corner members.
- Exceptionally clean appearance.
- Baked acrylic finish.
- 18 ga. steel side, top, and bottom panels.
- Panel mounting screws and nuts.
- Stacks neatly, to maximum weight of 400 pounds.

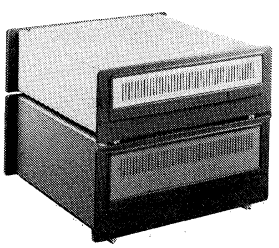




Optima 17" Instrument Cases

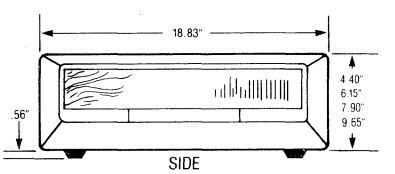
- Available in 3 sizes:
  Panel Heights: 4.74, 6.49, 8.24" Width: 17" Depth: 16"
- Combination chassis case in one integrated unit.
- Chassis consists of sides, front panel, sub-panel, rear panel and a lateral mounting or component shelf.
- Chassis construction offers full accessibility for assembly and checkout.
- Front panel, rear panel, and case parts are finished with baked acrylic paint.
- Sides include a matrix of holes for mounting component parts and sub-assemblies.

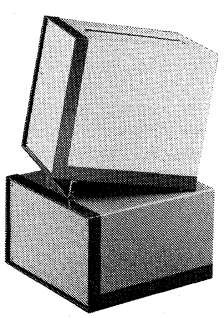




OptimaPak

- Available in 8 sizes:
  Panel Heights: 3.50", 5.25", 7.00", 8.75"
  Widths: 17, 19" Depth: 16"
- Molded structural foam side members, with strength-to weight ratio 2-5 times greater than steel. Dent resistant.
- Chassis can be removed for rack-mounting.
- Easily removed top and bottom panels.
- Cooling slots on side and bottom panels.
- Retractable handle neatly designed in.
- No visible front panel hardware.
- Acoustic dampening 5-10 times better than steel.
- Stacks neatly.

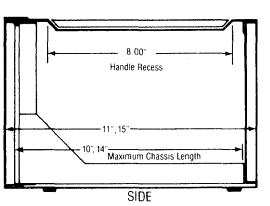




Small Portable Cases

Mobile, versatile, and rugged. Cases consist of two major elements: an easily removed one-piece cover, and bezel-and-bottom pan assembly.

- Available in 18 sizes:
  Panel Heights: 2.61", 4.36", 6.11", 7.86", 9.61"
  Widths: 5, 8, 11" Depth: 10, 14"
- Panel and chassis are loaded from the front.
- Tilt stand to raise the front of case 1½".
- Non-stain celcon plastic feet.
- Flush-mounted, self-retracting handle with trim strip.



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Easy Reference Size Guide

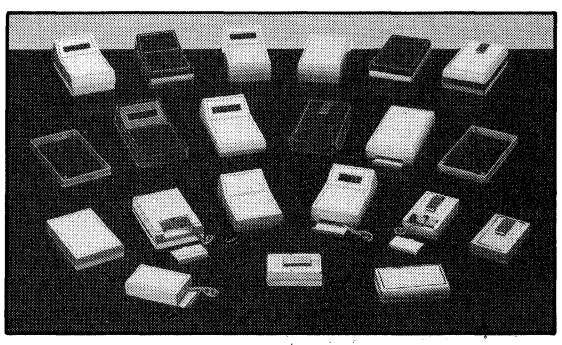
PacTec Standard Enclosures
Size Ranges Of Models Within Series
(Exterior Dimensions)

MODELS	MINIMUM DIMENSIONS			MAXIMUM DIMENSIONS			STANDARD COLORS			
	WIDTH	LENGTH	HEIGHT	WIDTH	LENGTH	HEIGHT	BLACK	GREY	TAN	P.C.BONE
H-Series	2.40"	3.80"	.90"	4.05"	7.55"	2.86"	X	X	X	X
CM-Series	3.33"	5.25"	1.75"	6.06"	6.25"	2.50"	X	X	X	X
CM69-Series*	6.33"	9.50"	1.38"	8.08"	6.25"	2.50"	X	X	X	X
CF-Series*	8.36"	9.11"	1.65"	8.36"	9.11"	3.65"	X	X	X	X
C-Series	8.50"	9.25"	2.44"	8.50"	9.25"	6.44"	X	X	X	X
CL-Series	12.50"	11.63"	3.51"	12.50"	11.63"	8.76"	X	X	X	X
KEU-Series	7.00"	5.00"	3.00"	10.00"	8.03"	4.20"	X	X	X	X
KE-Series	17.08"	8.68"	2.26"	20.08"	8.68"	2.26"	N/A	N/A	N/A	X
DE-Series	19.63"	15.50"	6.55"	19.63"	20.01"	7.22"	N/A	N/A	N/A	X
CRT-20				Refer to page C•1071			N/A	N/A	N/A	X

*CM69 and CF-Series may be ordered with mixed top and bottom colors.

NOTE All models are available as Prototype Kits or Production Units. Prototype Kits are individually packaged and include all parts and hardware necessary for assembly. Production Units include all parts and hardware necessary for assembly packaged in bulk with the exception of removable panels which are ordered separately.

H-Series



- The smallest enclosures in the PacTec line, "H" Series is ideal for keypads, programmable controllers, pocket pagers, computer interfaces and more.
- All models are available as prototype Kits or in Production units. Prototyping Kits are individually packaged and include all parts and hardware necessary for assembly. Production units include top and bottom covers and appropriate hardware, packaged in bulk. Removable panels for HM, HPS and HPLS production units may be ordered separately.
- Model HP is the base model, HPL is an elongated version, HM is a mini size. HPS and HPLS models have a sloped display area. The suffix "9VB" denotes an internal 9-volt battery compartment, suffix "XH" denotes the incorporation of an expander to increase overall height; the expander can be retrofitted to existing, corresponding models.

PRODUCTION MODELS (See Note)	AREA	WIDTH in	WIDTH mm	LENGTH in	LENGTH mm	HEIGHT in	HEIGHT mm
HM	outside	2.40	60,96	3.80	96,52	.90	22,86
	inside	2.19	55,63	3.52	89,41	.71	18,03
HM-9VB	outside	2.40	60,96	3.80	96,52	1.00	25,40
	inside	2.19	55,63	2.20	55,88	.85	21,59
HML	outside	2.75	69,85	4.60	116,84	.90	22,86
	inside	2.54	64,52	4.36	110,74	.75	19,05
HML-9VB	outside	2.75	69,85	4.60	116,84	1.00	25,40
	inside	2.54	64,52	2.96	75,18	.85	21,59
HP	outside	3.60	91,44	5.75	146,05	1.12	28,45
	inside	3.37	85,60	5.52	140,21	.92	23,37
HP-9VB	outside	3.60	91,44	5.75	146,05	1.29	32,77
	inside	3.37	85,60	3.97	100,58	1.08	27,43
HPL	outside	4.00	101,60	7.50	190,50	1.12	28,45
	inside	3.78	96,01	7.28	184,91	.92	23,37
HPL-9VB	outside	4.00	101,60	7.50	190,50	1.29	32,77
	inside	3.78	96,01	5.75	146,05	1.08	27,43
HPS	outside	3.60	91,44	5.75	146,05	1.92	48,77
	inside	3.37	85,60	5.52	140,21	.92	23,37
HPS-9VB	outside	3.60	91,44	5.75	146,05	2.09	53,09
	inside	3.37	85,60	3.97	100,58	1.08	27,18
HPLS	outside	4.00	101,60	7.50	190,50	2.09	53,09
	inside	3.78	96,01	7.28	184,91	.92	23,37
HLPS-9VB	outside	4.00	101,60	7.50	190,50	2.26	57,40
	inside	3.78	96,01	5.75	146,05	1.08	27,43
HP-XH	outside	3.63	92,2	5.78	146,81	1.52	38,61
	inside	3.37	85,6	5.52	140,21	1.32	33,53
HP-9VB-XH	outside	3.63	92,2	5.78	146,81	1.69	42,93
	inside	3.37	85,6	5.52	140,21	1.49	37,85
HPS-XH	outside	3.63	92,2	5.78	146,81	2.32	58,93
	inside	3.37	85,6	5.52	140,2	1.32	33,53
HPS-9VB-XH	outside	3.63	92,2	5.78	146,81	2.49	63,25
	inside	3.37	85,6	5.52	140,21	1.49	37,85
HPL-XH	outside	4.05	102,87	7.55	191,77	1.72	43,69
	inside	3.78	96,01	7.28	184,91	1.52	38,61
HPL-9VB-XH	outside	4.05	102,87	7.55	191,77	1.89	48,01
	inside	3.78	96,01	7.28	184,91	1.69	42,93
HPLS-XH	outside	4.05	102,87	7.55	191,77	2.69	68,33
	inside	3.78	96,01	7.28	184,91	1.52	38,61
HPLS-9VB-X	outside	4.05	102,87	7.55	191,77	2.86	72,64
	inside	3.78	96,01	7.28	184,91	1.69	42,93

***All models are available as Prototype Kits. Add the prefix K to order.**

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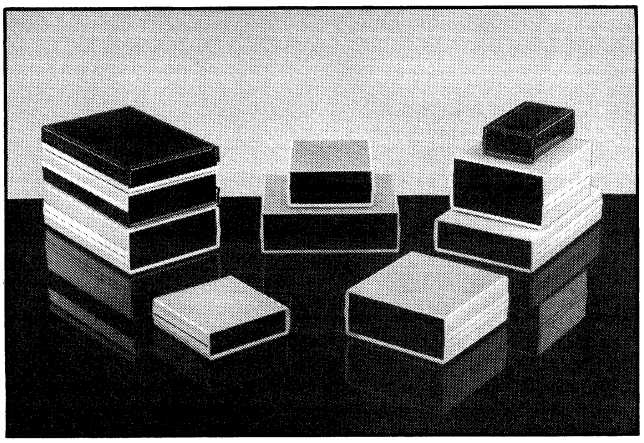
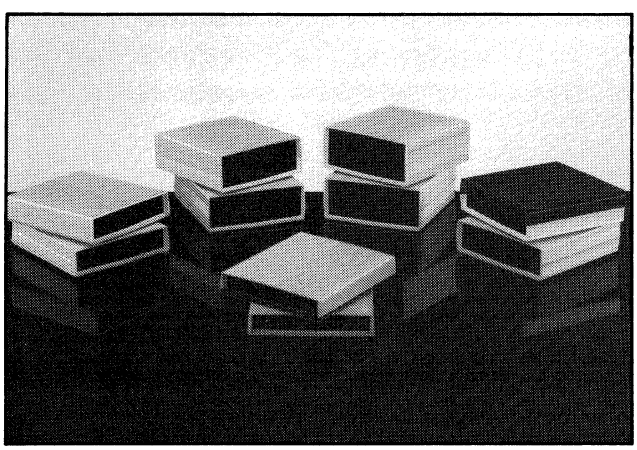


CM-Series

- CM Series is available in nine models and is especially suited for test instruments, computer peripherals and medical electronics packaging.
- All models are available as prototype Kits or Production units. Prototyping Kits are individually packaged and include all parts and hardware necessary for assembly. Production units include top and bottom covers and appropriate hardware, packaged in bulk. Removable front and rear panels may be ordered separately.
- CM69-120, CM69-180 and CM69-240 are available in the Designer Series. Top and bottom covers are interchangeable and may be ordered from stock in mixed, standard colors.

KIT MODELS	PRODUCTION MODELS
K-CM3-150	CM3-150
K-CM5-125	CM5-125
K-CM5-200	CM5-200
K-CM6-225	CM6-225
K-CM6-300	CM6-300
K-CM69-120	CM69-120
K-CM69-180	CM69-180
K-CM69-240	CM69-240
K-CM86-225	CM86-225

AREA	WIDTH		LENGTH		HEIGHT	
	in	mm	in	mm	in	mm
outside	3.33	84.6			1.75	4.45
inside	2.34	59.4			1.19	30.2
outside	5.08	129.0	5.25	133.4	1.50	38.1
inside	4.10	104.1	4.81	122.2	.95	24.1
outside	5.08	129.0			2.25	57.2
inside	4.10	104.1			1.70	43.18
outside	6.06	153.9			2.50	63.5
inside	4.85	123.0	6.25	158.8	1.95	49.3
outside	6.06	153.9	5.75	146.1	3.25	82.6
inside	4.85	123.0			2.70	68.6
outside	6.33	160.78	9.50	241.30	1.38	35.05
inside	5.12	130.1	8.94	227.08	.93	23.62
outside	6.33	160.78	9.50	241.30	1.99	50.55
inside	5.12	130.1	8.94	227.08	1.54	39.12
outside	6.33	160.78	9.50	241.30	2.59	65.79
inside	5.12	130.1	8.94	227.08	2.14	54.36
outside	8.08	205.2	6.25	158.8	2.50	63.5
inside	6.87	174.5	5.75	146.0	1.95	49.5



CF-Series

- CF Designer Series is available in five models and is especially suited for test instruments, computer peripherals, medical electronics packaging and more.
- All models are available as prototype Kits or Production units. Prototyping Kits are individually packaged and include all parts and hardware necessary for assembly. Production units include top and bottom covers and appropriate hardware, packaged in bulk. Removable front and rear panels may be ordered separately.
- CF Designer Series top and bottom covers are interchangeable and may be ordered from stock in mixed, standard colors.

KIT MODELS	PRODUCTION MODELS
KCF-125, *KCFB-125	CF-125, *CFB-125
KCF-175, *KCFB-175	CF-175, *CFB-175
KCF-225, *KCFB-225	CF-225, *CFB-225
KCF-275, *KCFB-275	CF-275, *CFB-275
KCF-325, *KCFB-325	CF-325, *CFB-325

*B: With Bail Tilt Stand

AREA	WIDTH		LENGTH		HEIGHT	
	in	mm	in	mm	in	mm
outside	8.360	212,34	9.110	231,39	** 1.650	41,91
inside	7.800	198,12	8.000	203,20	** 1.074	27,28
outside	8.360	212,34	9.110	231,39	** 2.150	54,61
inside	7.800	198,12	8.000	203,20	** 1.574	39,98
outside	8.360	212,34	9.110	231,39	** 2.650	67,31
inside	7.800	198,12	8.000	203,20	** 2.074	52,68
outside	8.360	212,34	9.110	231,39	** 3.150	80,01
inside	7.800	198,12	8.000	203,20	** 2.574	65,38
outside	8.360	212,34	9.110	231,39	3.650	92,71
inside	7.800	198,12	8.000	203,20	3.074	78,08

** Indicated models available with expanders to increase overall height .25" (6,35 mm). Add suffix "XH" when ordering.

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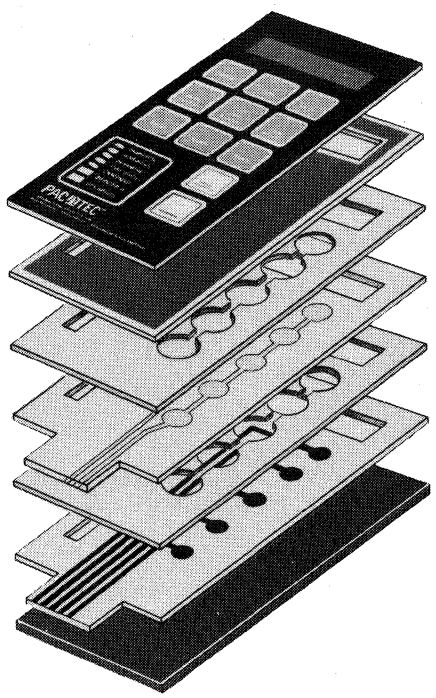
PACITEC®
Division of LaFrance Corp.

Custom and Standard Membrane Switches

- Prototypes in four weeks
- UV cured hard coat
- Composite construction
- Dead-front windows with adjusted density and/or color
- Single, double or triple pole
- Tactile feel
- Audible feedback
- Choice of interconnect: independant w/common or matrix
- Color matching to PMS, Federal Specification 595, Munsell or to color chip
- EMI/RFI shielding optional
- 100% testing



- **Graphics Panel**
- **EMI/RFI Shielding (Optional)**
- **Spacer**
- **Upper Switch Circuit**
- **Spacer**
- **Lower Switch Circuit**
- **Subpanel/Assembly Mounting**

The PacTec membrane switch assembly is completely sealed from the environment and highly impervious to chemical and solvent intrusion. Keypads may have embossed or debossed borders. Graphic panels may incorporate selective surface finishing. Final assembled thickness of the switch usually ranges from .022" to .026", including laminating adhesive layers.

SPECIFICATIONS

- **Contact Rating:** 20 milliamps at 30 VDC
- **Maximum Rating:** 100 milliamps with maximum power of 1.5 amps (50 VDC maximum)
- **Circuit Resistance:** less than 100 ohms (ON), 10 megohms (OFF)
- **Contact Resistance:**
  silver, less than 8 milliohms per square inch
  silver and graphite hybrid, less than 7 ohms per square inch
  graphite, less than 10 ohms per square inch
  stabilized nickel, less than 10 ohms per square inch
- **Open Circuit:** greater than 20 megohms
- **Life Expectancy:** 10+ million actuations
- **Activation Force:** 2-12 oz. nominal
- **Travel:** .009" to .014"
- **Bounce:** 1 to 10 milliseconds nominal
- **Operating Temperature:** -40° to +85° C
- **Moisture Transmission Rate:** 0
- **Electrostatic Interference Resistance:** optional, shielding may be incorporated
- **Tolerances:**
  hole diameter, + .01"
  steel rule die tooling, + .01"
  hard tooling, + .002"
- **Total Assembled Thickness:** .022" to .026"
- **Screen Printing Capability:** up to 365 mesh (steel)

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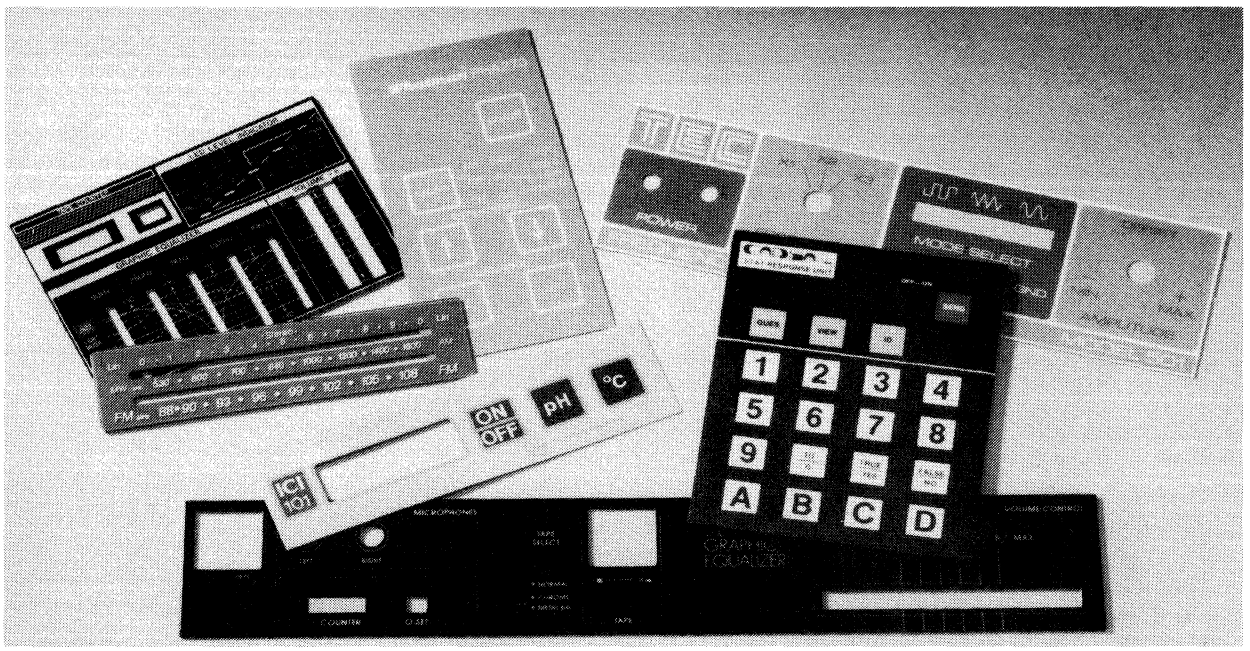
PACTEC®
Division of LaFrance Corp.

Graph-Tec™ Panels

CUSTOM PRINTED OVERLAYS



Specialists in Control Panels, Nameplates, Overlays, Faceplates, Templates and Instruction Plates.

Design Assistance
The LaFrance design and engineering staffs bring together years of accumulated experience in mechanical, electronic and graphics design. Combined with totally in-house cost estimating, manufacturing and quality control a specialized team will help bring your project to a successful conclusion. Write or phone for details.

Materials of Manufacture

Polycarbonate	Polyvinylchloride
Polyester	Polystyrene

Color Matching

Standard PMS Colors	Munsell
Federal Specification 595	Custom Colors

Printing and Imprinting Methods
- SCREEN PRINTING up to 25"x30"x.003" to .060" thick.
- OFFSET PRINTING up to 25"x38"x.005" to .030" thick.
- TRANSFER PAD PRINTING with the ability to print on raised or depressed pads and curved surfaces.
- HOT STAMPING with a rainbow of brilliant colors including metallics.

Laminating Methods
- ROLLER LAMINATING to infinite length x 24"w x .003" and greater thicknesses.
- HIGH PRESSURE LAMINATING up to 25"x38"x .007" to .250" thick.

Finishing Options
- Press polishing by high pressure laminating, producing mirror, matte and satin finishes.
- Screen printed finishes include velvet, gloss, semi-gloss and matte, plus various selective textures.
- Embossing

Die Cutting
- Steel rule, up to 25"x38".
- Hard die punching.

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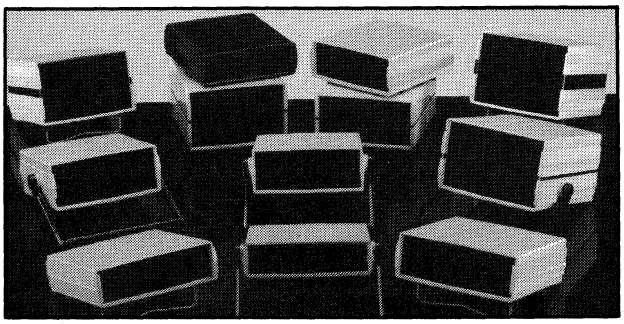
C-Series

- All "C" Series models are available as prototyping Kits or Production units.
- Kit K-C23 can be assembled into one of six, pre-selected heights ranging from 1.68" through 2.93" (nominal inside dim.) in increments of .250". Kits K-CS-400, K-CS-500 and K-CS-600 are fixed height units.

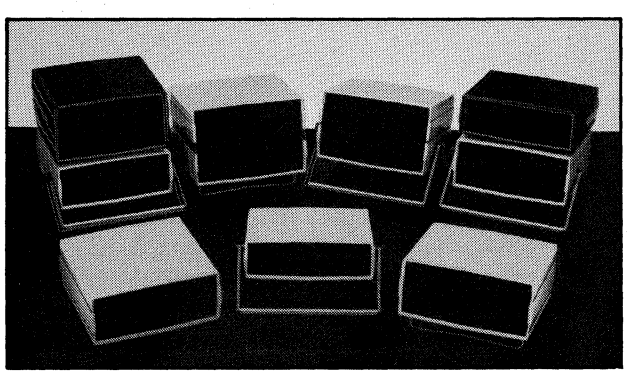


KIT MODELS			PRODUCTION MODELS		
BASIC KIT	KIT W/ HANDLE	KIT W/ TILT STAND	BASIC CASE	CASE W/ HANDLE	CASE W/ TILT STAND
K-C-23	K-CH-23	K-CB-23	C-200	CH-200	CB-200
			C-225	CH-225	CB-225
			C-250	CH-250	CB-250
			C-275	CH-275	CB-275
			C-300	CH-300	CB-300
K-C-23	K-CH-23	K-CB-23	C-325	CH-325	CB-325
K-CS-400	K-CHS-400	K-CBS-400	CS-400	CHS-400	CBS-400
K-CS-500	K-CHS-500	K-CBS-500	CS-500	CHS-500	CBS-500
K-CS-600	K-CHS-600	K-CBS-600	CS-600	CHS-600	CBS-600

AREA	WIDTH		LENGTH		HEIGHT	
	in	mm	in	mm	in	mm
outside	8.50	215,9	9.25	235,0	2.44	61,9
inside	7.80	198,1	8.00	203,2	1.68	42,7
outside	8.50	215,9	9.25	235,0	2.69	68,3
inside	7.80	198,1	8.00	203,2	1.93	49,0
outside	8.50	215,9	9.25	235,0	2.94	74,6
inside	7.80	198,1	8.00	203,2	2.18	55,4
outside	8.50	215,9	9.25	235,0	3.19	81,0
inside	7.80	198,1	8.00	203,2	2.43	61,7
outside	8.50	215,9	9.25	235,0	3.44	87,3
inside	7.80	198,1	8.00	203,2	2.68	68,1
outside	8.50	215,9	9.25	235,0	3.69	93,7
inside	7.80	198,1	8.00	203,2	2.93	74,4
outside	8.50	215,9	9.25	235,0	4.44	112,7
inside	7.80	198,1	8.00	203,2	3.68	93,5
outside	8.50	215,9	9.25	235,0	5.44	138,2
inside	7.80	198,1	8.00	203,2	4.68	118,9
outside	8.50	215,9	9.25	235,0	6.44	163,6
inside	7.80	198,1	8.00	203,2	5.68	144,3

CL-Series

- All "CL" Series models are available as prototyping Kits or Production units.
- Kit K-CLLP-34 can be assembled into one of four, pre-selected heights ranging from 2.50" through 3.25" (nominal inside dim.) in increments of .250". Kit K-CL-45 can be assembled into one of six, pre-selected heights ranging from 3.50" through 4.75" (nominal inside dim.) in increments of .250". Kits K-CLS-625, K-CLS-725 and K-CLS-825 are fixed height units.



KIT MODELS			PRODUCTION MODELS		
BASIC KIT	KIT W/ HANDLE	KIT W/ TILT STAND	BASIC CASE	CASE W/ HANDLE	CASE W/ TILT STAND
K-CLLP-34	K-CLLPH-34	K-CLLPB-34	CLLP-300	CLLPH-300	CLLPB-300
			CLLP-325	CLLPH-325	CLLPB-325
			CLLP-350	CLLPH-350	CLLPB-350
K-CLLP-34	K-CLLPH-34	K-CLLPB-34	CLLP-375	CLLPH-375	CLLPB-375
K-CL-45	K-CLH-45	K-CLB-45	CL-400	CLH-400	CLB-400
			CL-425	CLH-425	CLB-425
			CL-450	CLH-450	CLB-450
			CL-475	CLH-475	CLB-475
			CL-500	CLH-500	CLB-500
K-CL-45	K-CLH-45	K-CLB-45	CL-525	CLH-525	CLB-525
K-CLS-625	K-CLHS-625	K-CLBS-625	CLS-625	CLHS-625	CLBS-625
K-CLS-725	K-CLHS-725	K-CLBS-725	CLS-725	CLHS-725	CLBS-725
K-CLS-825	K-CLHS-825	K-CLBS-825	CLS-825	CLHS-825	CLBS-825

AREA	WIDTH		LENGTH		HEIGHT	
	in	mm	in	mm	in	mm
outside	12.50	317,5	11.63	295,4	3.51	89,2
inside	11.77	299,0	10.40	264,2	2.50	63,5
outside	12.50	317,5	11.63	295,4	3.76	95,5
inside	11.77	299,0	10.40	264,2	2.75	69,9
outside	12.50	317,5	11.63	295,4	4.01	101,9
inside	11.77	299,0	10.40	264,2	3.00	76,2
outside	12.50	317,5	11.63	295,4	4.26	108,2
inside	11.77	299,0	10.40	264,2	3.25	82,6
outside	12.50	317,5	11.63	295,4	4.51	114,6
inside	11.77	299,0	10.40	264,2	3.50	88,9
outside	12.50	317,5	11.63	295,4	4.76	120,9
inside	11.77	299,0	10.40	264,2	3.75	95,3
outside	12.50	317,5	11.63	295,4	5.01	127,3
inside	11.77	299,0	10.40	264,2	4.00	101,6
outside	12.50	317,5	11.63	295,4	5.26	133,6
inside	11.77	299,0	10.40	264,2	4.25	108,0
outside	12.50	317,5	11.63	295,4	5.51	140,0
inside	11.77	299,0	10.40	264,2	4.50	114,3
outside	12.50	317,5	11.63	295,4	5.76	146,3
inside	11.77	299,0	10.40	264,2	4.75	120,7
outside	12.50	317,5	11.63	295,4	6.76	171,7
inside	11.77	299,0	10.40	264,2	5.75	146,1
outside	12.50	317,5	11.63	295,4	7.76	197,1
inside	11.77	299,0	10.40	264,2	6.75	171,5
outside	12.50	317,5	11.63	295,4	8.76	222,5
inside	11.77	299,0	10.40	264,2	7.75	196,9

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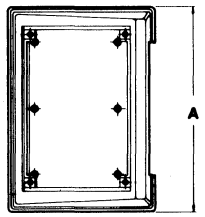
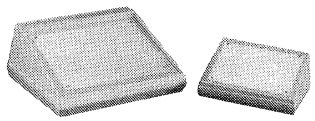
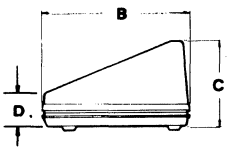
KEU-Series

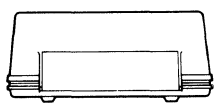




KEU-7
Top Panel 5.88" x 4.13" (149,35 x 104,9mm)
Rear Panel 4.87" x 1.51" (123,7 x 38,35mm)

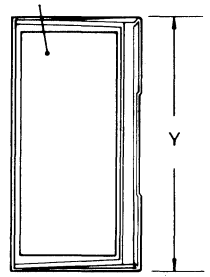
KEU-10
Top Panel 8.25" x 5.75" (209,55 x 146,05mm)
Rear Panel 6.99" x 1.84" (177,55 x 46,74mm)

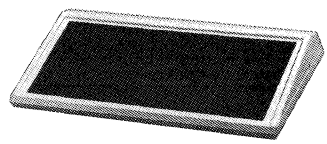


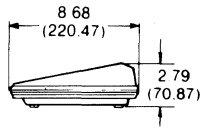


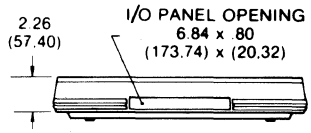
MODEL	A	B	C	D
KEU-7	7.00" (177,8mm)	5.00" (127mm)	3.10" (78,74mm)	2.90" (73,66mm)
KEU-10	10.00" (254mm)	8.03" (204mm)	4.20" (106,7mm)	4.00" (101,6mm)

KE-Series



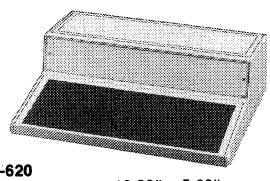


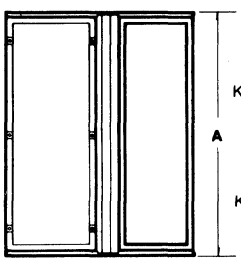




MODEL	W	Y	Z
KE17	14.80 (375,92)	17.08 (433,83)	15.08 (383,03)
KE20	17.80 (452,12)	20.08 (510,03)	18.08 (459,23)

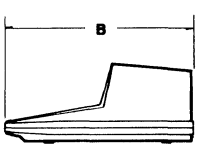
DE-Series

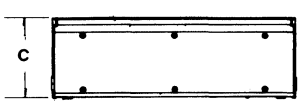




DE-620
Rear Panel 19.26" x 5.00" (489,2 x 127mm)
Keyboard Panel 17.69" x 6.49" (449,33 x 164,85mm)

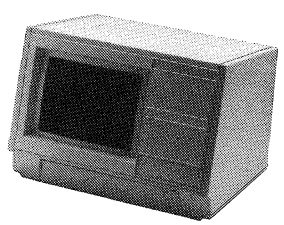
DE-720
Rear Panel 19.26" x 6.26" (489,2 x 159mm)
Keyboard Panel 17.69" x 6.49" (449,33 x 164,85mm)

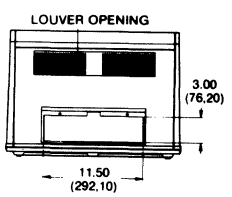




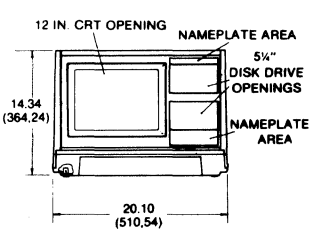
MODEL	A	B	C
DE-620	19.63" (498,60mm)	15.50" (393,70mm)	5.84" (148,34mm)
DE-720	19.63" (498,60mm)	20.01" (508,25mm)	7.10" (180,34mm)

CRT 20

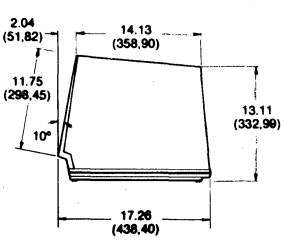




REAR VIEW



FRONT VIEW



SIDE VIEW

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Specifications

Material - Impact resistant ABS. A flame retardant grade meeting UL94V-0 standards is optional. Standard models are manufactured in four molded-through colors: tan, gray, black and PC bone. Molded-through colors reduce the visibility of chips and scratches, virtually eliminating the need for refurbishing after assembly.

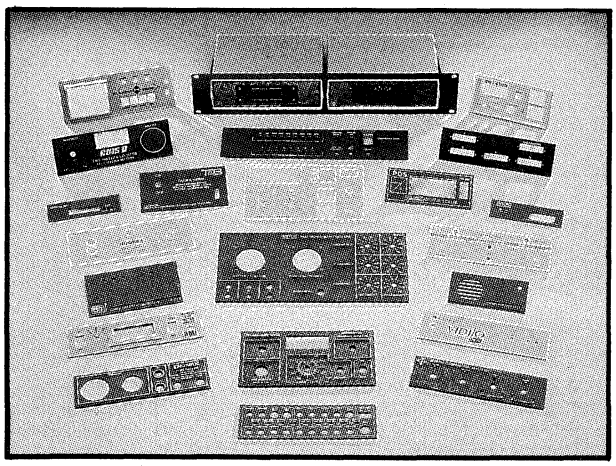
EMI/RFI Resistance - Provided as an option. Shielding is a factory applied, nickel or copper base, conductive coating. PacTec can produce enclosures that test at a maximum of 1 ohm per square. Other shielding materials are available upon request including silver and graphite, etc.

Custom Panels

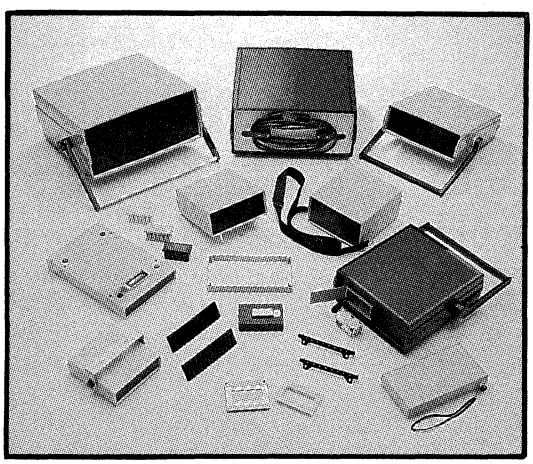
Custom panels enhance and distinguish your product from all others and can at the same time provide significant cost savings through reduction of assembly costs and the elimination of secondary operations. Die cast zinc and molded plastic panels can incorporate posts or bosses to mount components, flanges to hold PC boards, ventilation slots, speaker grills, display bezels and openings for controls and LED's.

Custom panels are also available manufactured of punched and blanked flat aluminum sheet and printed plastics, including for example, vinyl, polyester, polycarbonate, polystyrene and other materials.

A recently developed product consists of printed vinyl hot-laminated to flat aluminum sheet.



Accessories



Accessories

- Shoulder Strap
- Standard Handle
- Universal Handle
- Wrist Strap
- Cord Wrap
- Belt Clip
- Tilt Stand
- 1½ Volt Stand Alone Battery Compartment
- 9 Volt Stand Alone Battery Compartment
- Mounting Bracket
- Card Guides
- Mounting Rails
- Surround
- Rear Extension
- LCD Adapter

Options

- Four standard colors
- Custom matched colors
- Color combinations
- Vinyl cladding or hot-stamped finished
- EMI/RFI shielding
- Battery compartment
- Sloped top or bottom covers
- Louvers
- Vents
- Connector cut-outs
- Speaker grills
- Spot facing for stacking

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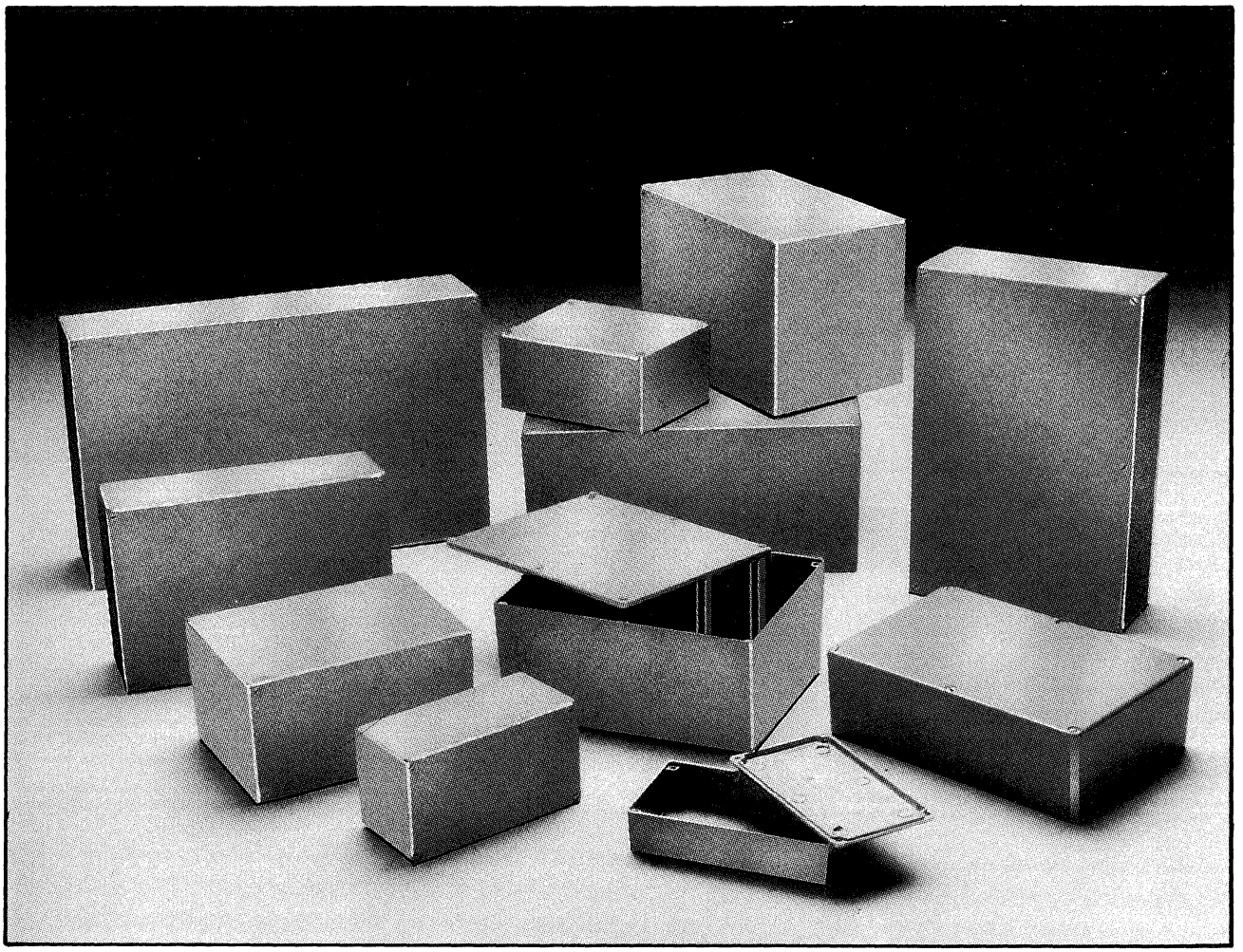
PACTEC UTILITY ENCLOSURES

POLYCARBONATE • ABS • ALUMINUM



ALUMA-PAC Series

MATERIAL:

Aluminum w/o gasket.
Aluminum with gasket.
Aluminum w/o gasket, with textured gray enamel finish.

MODIFICATIONS:

Machine modifications for all aluminum enclosures can be provided by PacTec and include milling, drilling and punching, as required.

EXTERIOR DIMENSIONS

MODEL	WIDTH (in.)	LENGTH (in.)	HEIGHT (in.)
UEG 141	1.37	3.50	1.16
UEG 351	2.50	4.50	1.16
UEG 352	2.50	4.50	2.16
UEG 451	3.94	4.72	1.38
UEG 452	3.50	4.50	2.16
UEG 463	3.94	5.51	2.95
UEG 572	4.75	6.75	2.16
UEG 573	5.00	6.50	2.95
UEG 574	4.75	6.75	4.16
UEG 692	5.75	8.75	2.16
UEG 694	5.75	8.75	4.16
UEG 7113	6.89	10.83	2.56
UEG 10104	9.84	9.84	3.94

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PACTEC UTILITY ENCLOSURES

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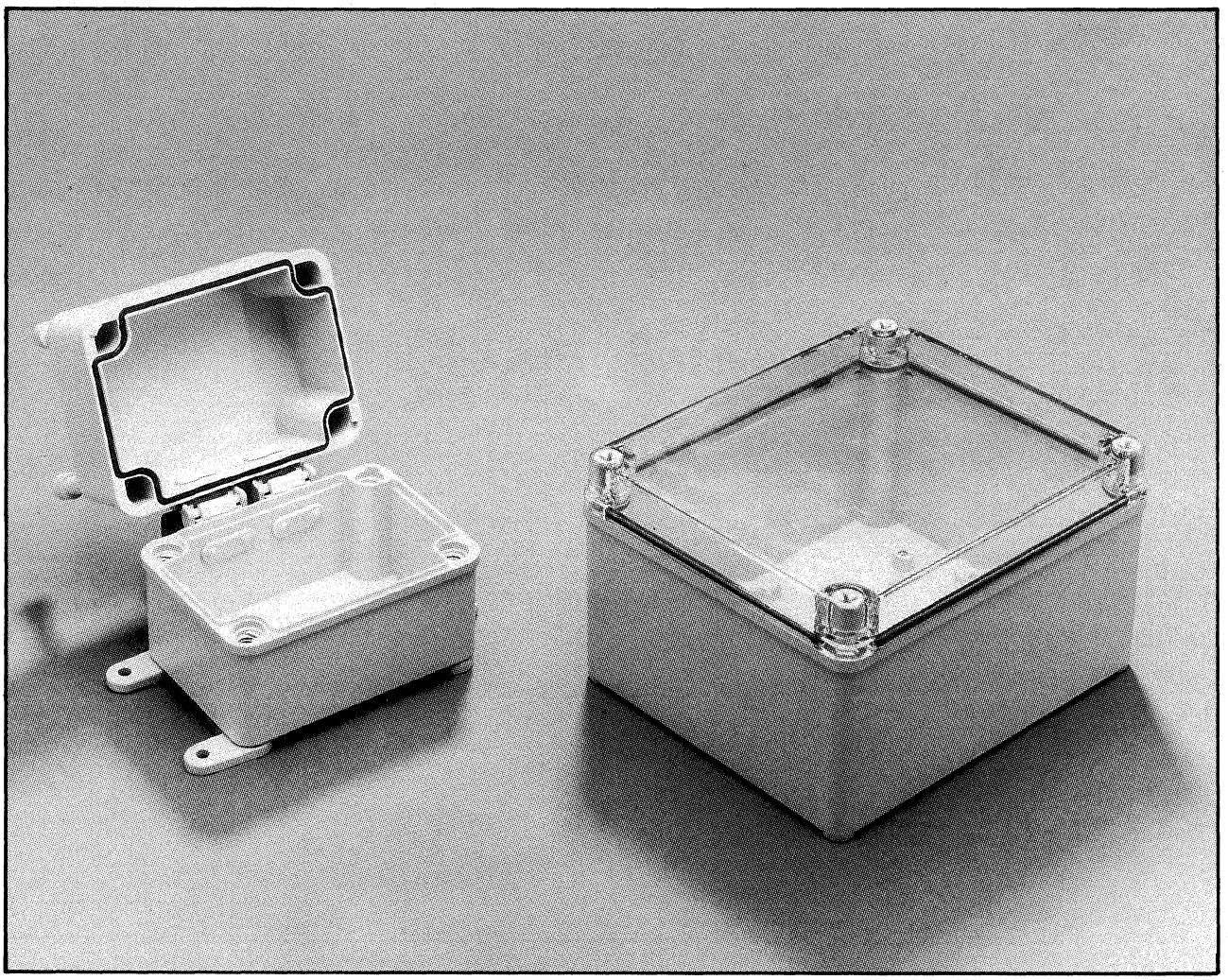

APEX Series

EXTERIOR DIMENSIONS

MODEL	WIDTH (in.)	LENGTH (in.)	HEIGHT (in.)
UEG 342	2.50	4.00	1.75
UEG 352	3.15	5.00	2.16
UEG 463	4.00	6.25	2.56
UEG 583	5.00	7.87	2.95

MATERIALS:
Polycarbonate glass reinforced gray Base with optional non-reinforced gray or clear Polycarbonate Cover.
ABS gray Base with ABS gray Cover or optional Polycarbonate clear Cover.

INDUSTRY STANDARDS/ PROTECTION CLASSIFICATIONS:
Polycarbonate: NEMA Types 1, 2, 3, 3R, 4, 4X, 12 & 13. UL 94-VO. IP 65 (IEC 529).
ABS: NEMA Types 1, 2, 3, 3R, 4, 4X, 12 and 13. UL 94-VO. IP 65 (IEC 529).

GASKET (OPTIONAL):
Oil and acid resistant polyurethane.

ACCESSORIES:
Wall mounting adapter brackets are available for all Apex Series models.

Note: Additional Apex Series models will be available in the first quarter 1990.

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COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

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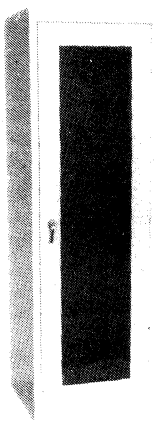
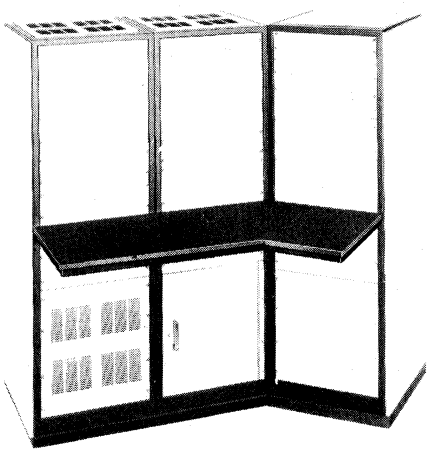
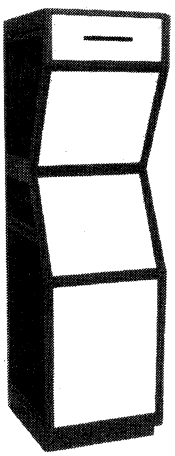
RFI & EMI SHIELDED ENCLOSURE WITH SHIELDED WINDOW



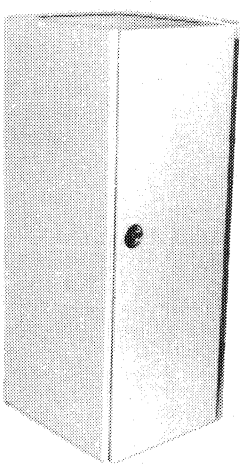
CONTEMPO VERTICAL UNIT WELDED RACKS



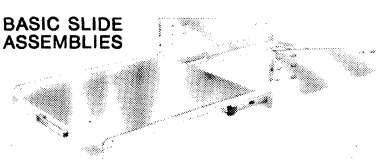
REVERSE SLOPE CONSOLE



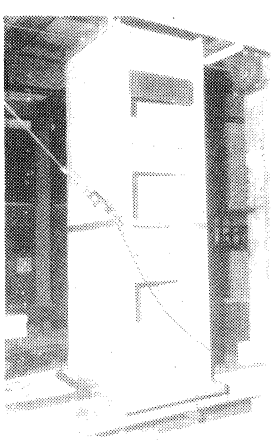
ALL ALUMINUM CABINETS



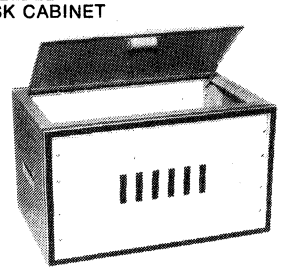
BASIC SLIDE ASSEMBLIES



SEISMIC CABINET



SHIELDED LIFT TOP DESK CABINET



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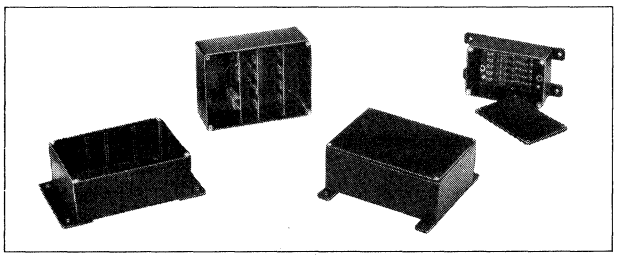
A practical, low-cost package for small to medium sized electronic devices or circuitry.

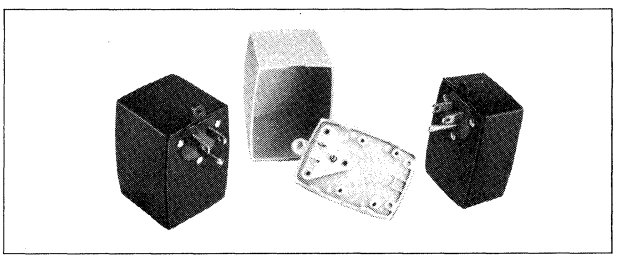
GENERAL PURPOSE

- 4 sizes/2 styles-plain or mounting feet
- Sizes from 4.5×3.0×1.75 inches to 7.5×4.5×2.25 inches (L×W×H)
- Screw-on covers included
- Flame retardant ABS (U/L 94V-0)



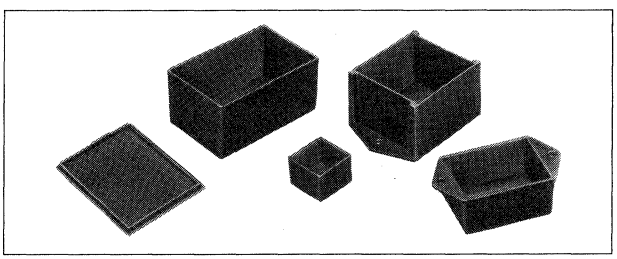
PLUG-IN MODULES

- U/L recognized component
- 2 or 3 pole grounded base
- 4 sizes
- Sizes from 2.0×2.0×1.75 inches to 2.0×3.0×2.25 inches (L×W×H)
- Flame retardant ABS (U/L 94V-0)



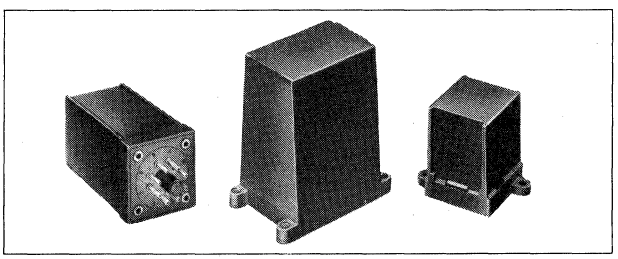
ENCAPSULATION BOXES & COVERS

- 5 sizes/3 styles-plain, top or bottom mounting feet
- Sizes from 1.0×1.0×.75 inches to 3.0×3.0×1.5 inches (L×W×H)
- Covers in all sizes
- Flame retardant ABS (U/L 94V-0)



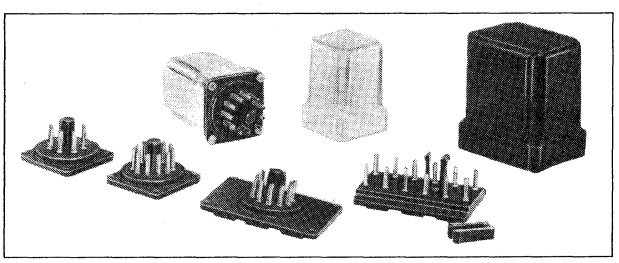
TYPE 15 & 23

- Flame retardant NYLON or POLYPROPYLENE (U/L 94V-2)
- 6 standard bases
- Internal slots for PC boards
- Sizes from 1.625×1.625×2.0 inches to 2.125×2.625×3.5 inches (L×W×H)



PLUG-IN HEADERS & HOUSINGS

- Housings-high impact LEXAN
- Bases-6/6 NYLON
- 8, 11, 12 pin bases



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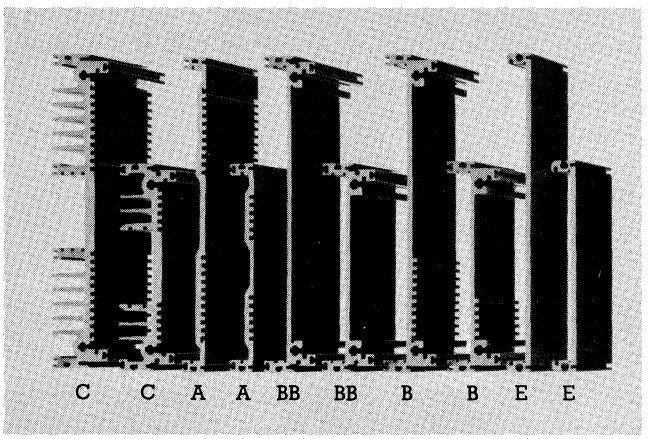
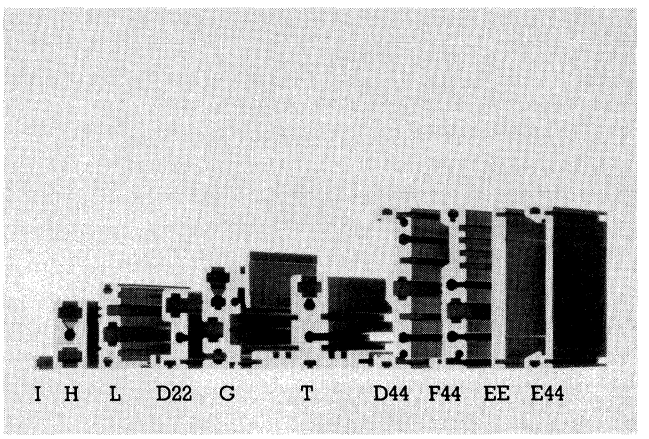
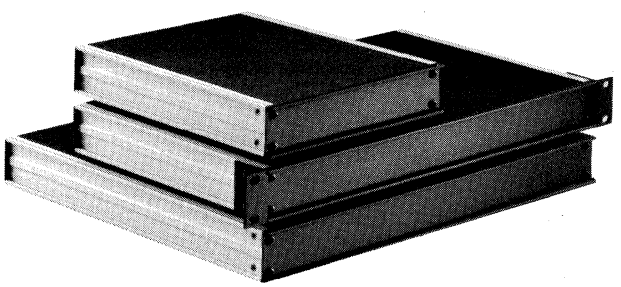




FEATURING:



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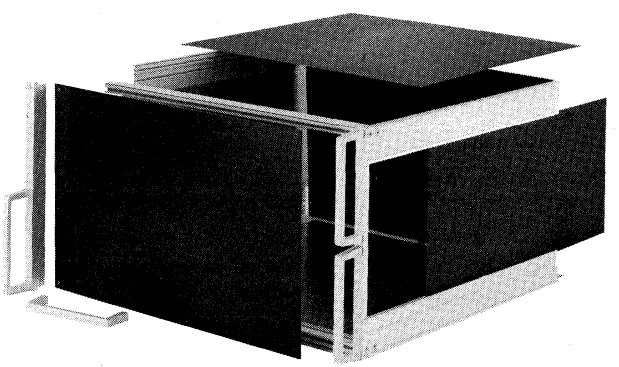

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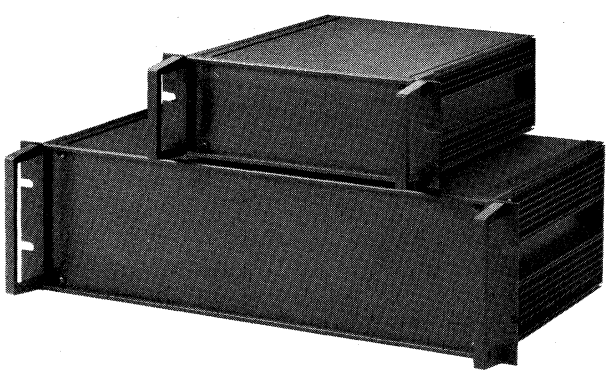

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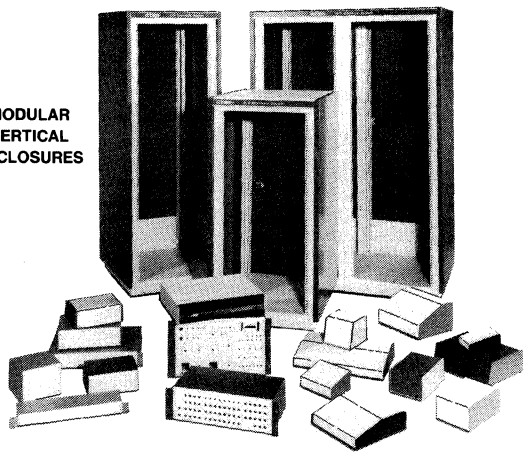
FORMERLY CTS METAL PRODUCTS



MODULINE MODULAR ENCLOSURES

A complete and compatible family of value engineered cabinets and vertical rack enclosures which meet the highest standards of quality, versatility, and ease of use at a surprisingly modest price.

All three lines: MOD-U-BOX, MOD-U-LINE, and MODULAR VERTICAL ENCLOSURES are specifically designed to complement each other and other standard electronics industry products.

Material: All PFT enclosures are manufactured from heavy gauge aluminum or cold rolled steel.

Finish: Beautiful oven-baked smooth and textured paints available in a selection of colors.

Design: Ease of assembly and replaceability of all parts are built-in features.

Price: Value engineering means top performance for bottom dollar.

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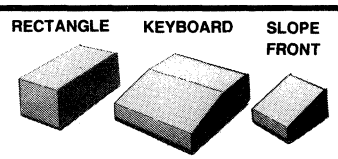
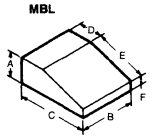
MOD-U-BOX

The MOD-U-BOX series presents a wide choice of small electronic cabinets. Distinctively styled, MOD-U-BOX offers rugged high quality construction at an exceptionally low price.

SIDE SHAPE	PART NUMBER	OUTSIDE DIMENSIONS, INCHES HEIGHT A	WIDTH B	DEPTH C	TOP D	SLOPE E	FRONT F	NET PRICE
	MBL 4-6-10	3 13/16	5 13/16	9 13/16	NA	NA	NA	$19.40
	MBS 3-4-6	2 3/4	4 1/4	6 13/16	NA	6 3/8	1 1/4	13.40
	MBS 3-7-6	3 1/8	6 3/4	5 3/8	NA	5 9/16	1 5/8	14.90
	MBS 4-10-10	3 1/2	10	10	8	3 3/16	1 1/16	28.30
	MBS 4-12-11	3 13/16	11 13/16	10 13/16	9 3/4	3 15/16	NA	29.80
	MBS 5-6-6	4 13/16	5 13/16	5 13/16	4 1/2	4 15/16	NA	16.40
	MBK 2-5-5	1 13/16	4 13/16	4 15/16	2 1/8	2 15/16	1 1/16	13.40
	MBK 2-7-6	2 5/16	6 1/2	5 13/16	2 15/16	3 1/4	3/8	14.00
	MBK 3-10-11	2 13/16	9 13/16	10 13/16	5	5 15/16	1 1/2	28.30
	MBK 3-13-11	2 13/16	12 13/16	10 13/16	5	5 15/16	1 1/2	29.80
	MBK 3-17-11	2 13/16	16 13/16	10 13/16	5	5 15/16	1 1/2	37.30
	MBK 3-20-11	2 13/16	19 13/16	10 13/16	5	5 15/16	1 1/2	40.30
	MBK 5-10-10	4 13/16	9 13/16	9 13/16	1 15/16	8 7/16	1 3/4	29.80
	MBK 6-12-10	5 3/4	11 13/16	9 15/16	3	7 1/2	2 13/16	34.30



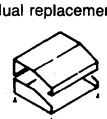
14 SIZES AVAILABLE



MOD-U-BOX FEATURES

Construction: Made from aluminum for lightweight strength and ease of handling. Wrap around base is .090" aluminum; sloped or flat front insert is .062" aluminum.

Ease of Assembly: Simple two piece design assembles or disassembles in minutes with just four screws. Allows easy access to your enclosed components. Individual replacement parts also may be ordered.



Colors & Finish: Cabinets are finished with oven-baked, EPA-approved paint. Wrap-around base has a textured finish while front insert is smooth. Standard colors are:

Wrap-Around Base	Front Insert
*Blue	*Off-White
Charcoal	Light Grey
Black	Black
Tan	Tan

***Note:** **BLUE** and **OFF-WHITE** cabinets in stock for immediate delivery. Call for current availability of other standard color combinations.

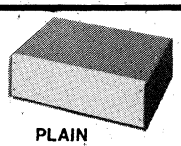
Modifications: PFT will make in-plant modifications to your specifications. Turn three pages to **STANDARD ENCLOSURE MODIFICATIONS** heading for a list of available modifications. Popular modifications include: silkscreening, venting, cut-outs, etc. Steel cabinets are also available through a special order.

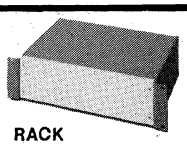
To Order Mod-U-Box: Select appropriate PFT model number and specify color combination by adding color suffix, the base color first followed by the insert color. For example, an **MBS-3-4-6** with a **BLACK** wrap-around base and an **OFF-WHITE** insert is ordered as follows: **"MBS 3-4-6 BLACK/OFF-WHITE".**

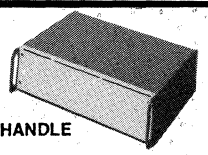
PFT METAL ENCLOSURES
FORMERLY CTS METAL PRODUCTS

MOD~U~LINE

Mod-U-Line is a line of quality small cabinets, available in standard off-the- shelf sizes. "Value Engineered" to provide the optimum in versatility, strength, and economy.


PLAIN


RACK


HANDLE

MOD-U-LINE FEATURES:

Construction: Made from aluminum for lightweight strength and ease of handling. Side panels are .125" aluminum. All other components are .062" aluminum. Side panels and chassis plates are ordered separately.

Ease of Assembly: Mod-U-Line cabinets are designed to assemble in minutes. The top cover is easily removed for complete and immediate access to the inside.

Replacement Parts: All components of Mod-U-Line may be replaced in seconds with stock panels. This feature reduces damage or redesign costs by eliminating the need to repaint or replace the entire unit.

Colors & Finish: Cabinets are finished with oven-baked, EPA-approved paint. All exterior parts have a textured finish, except the front panel, which has a smooth finish. Standard colors are:

Top, Bottom & Rear Panels	Front Panel	Side Panels
*Blue	*Off-White	*Blue
Charcoal	Light Grey	Charcoal
Black	Black	Black
Tan	Tan	Tan

***Note:** **BLUE** and **OFF-WHITE** components in stock for immediate delivery. Call for current availability of other standard color combinations. Chassis plate and interior side braces are gold alodined.

Modifications: PFT will make in-plant modifications to your specifications. Turn two pages to **STANDARD ENCLOSURE MODIFICATIONS** heading for a list of available modifications. Popular modifications include: silk screening, venting, cut-out, etc. Steel cabinets are also available through a special order. Vented top and bottom panels are also available.

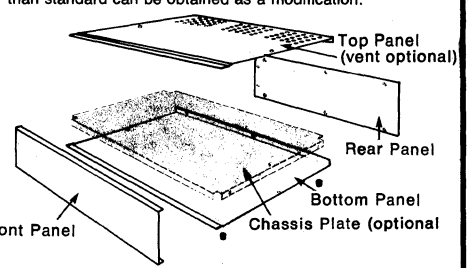
Order Mod-U-Line: A complete cabinet is ordered in three segments. 1) **Mod-U-Line Cabinet Less Sides (MCLS)** includes: front, back, top and bottom panels plus interior side braces. 2) Side Panels are ordered by style. **Side Panel Plain (SPP) Side Panel Rack (SPR), Side Panel Handle (SPH);** by size and color. Side panels are symmetrical - there are no righthand or lefthand panels. 3) Optional **Chassis Plate (CP)** is ordered individually according to table below. For example, a 3 5/16" x 16 5/8" x 11 7/8" cabinet with a **BLUE** exterior and **OFF-WHITE** front panel which has **BLUE RACK** side panels and a **16 5/8" x 11 7/8"** chassis plate is ordered as: **MCLS 3-17-12 BLUE/OFF - WHITE,** plus **SPR 3-12 BLUE, CP 17-12.**

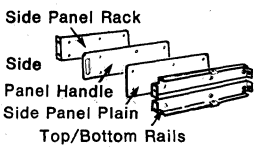
STANDARD VENTED TOP AND BOTTOM PANELS ORDERING INSTRUCTION

A 1" wide ventilation strip comprised of 1/8" holes on 1/4" centers may be ordered on either top **(VT)** or bottom **(VB)** panels or on both **(VTB),** if desired. Example: An **MCLS 3-17-12-VTB TAN/WHITE** would be vented on both top and bottom panels.

EXTRA COST PER PANEL $4.50

Venting other than standard can be obtained as a modification.





PART NUMBER	INSIDE HEIGHT	DIMS., WIDTH	INCHES DEPTH	RECOMMENDED CHAS'S PLTE	PRICE
1 INCH HEIGHT					
MCLS 1-8-7	1 1/16	8 5/8	6 7/8	CP 9-7	$32.40
MCLS 1-17-7	1 1/16	16 5/8 *	6 7/8	CP 17-7	37.30
MCLS 1-17-9	1 1/16	16 5/8 *	8 7/8	CP 17-9	38.95
2 INCH HEIGHT					
MCLS 2-8-9	2 1/16	8 1/16	8 7/8	CP 8-9	32.40
MCLS 2-17-9	2 1/16	16 5/8 *	8 7/8	CP 17-9	45.45
MCLS 2-17-12	2 1/16	16 5/8 *	11 7/8	CP 17-12	53.50
3 INCH HEIGHT					
MCLS 3-7-7	3 1/16	6 5/8	6 7/8	CP 7-7	34.05
MCLS 3-9-7	3 1/16	8 5/8	6 7/8	CP 9-7	32.40
MCLS 3-9-9	3 1/16	8 5/8	8 7/8	CP 9-9	34.05
MCLS 3-12-7	3 1/16	11 5/8	6 7/8	CP 12-7	35.70
MCLS 3-12-9	3 1/16	11 5/8	8 7/8	CP 12-9	42.20
MCLS 3-12-12	3 1/16	11 5/8	11 7/8	CP 12-12	49.65
MCLS 3-17-7	3 1/16	16 5/8 *	6 7/8	CP 17-7	35.70
MCLS 3-17-9	3 1/16	16 5/8 *	8 7/8	CP 17-9	43.65
MCLS 3-17-12	3 1/16	16 5/8 *	11 7/8	CP 17-12	50.36
MCLS 3-17-14	3 1/16	16 5/8 *	13 7/8	CP 17-14	56.99
5 INCH HEIGHT					
MCLS 5-7-7	5 1/16	6 5/8	6 7/8	CP 7-7	33.30
MCLS 5-9-7	5 1/16	8 5/8	6 7/8	CP 9-7	34.15
MCLS 5-9-9	5 1/16	8 5/8	8 7/8	CP 9-9	35.70
MCLS 5-9-12	5 1/16	8 5/8	11 7/8	CP 9-12	39.95
MCLS 5-12-7	5 1/16	11 5/8	6 7/8	CP 12-7	37.30
MCLS 5-12-9	5 1/16	11 5/8	8 7/8	CP 12-9	38.95
MCLS 5-12-12	5 1/16	11 5/8	11 7/8	CP 12-12	42.20
MCLS 5-17-7	5 1/16	16 5/8 *	6 7/8	CP 17-7	42.20
MCLS 5-17-9	5 1/16	16 5/8 *	8 7/8	CP 17-9	47.10
MCLS 5-17-12	5 1/16	16 5/8 *	11 7/8	CP 17-12	55.15
MCLS 5-17-14	5 1/16	16 5/8 *	13 7/8	CP 17-14	56.75
7 INCH HEIGHT					
MCLS 7-9-12	6 13/16	8 5/8	11 7/8	CP 9-12	45.45
MCLS 7-12-9	6 13/16	11 5/8	8 7/8	CP 12-9	47.10
MCLS 7-12-12	6 13/16	11 5/8	11 7/8	CP 12-12	53.60
MCLS 7-17-9	6 13/16	16 5/8 *	8 7/8	CP 17-9	53.60
MCLS 7-17-12	6 13/16	16 5/8 *	11 7/8	CP 17-12	61.65
MCLS 7-17-14	6 13/16	16 5/8 *	13 7/8	CP 17-14	84.90
8 INCH HEIGHT					
MCLS 8-17-12	8 1/16	16 5/8 *	11 7/8	CP 17-12	71.45
MCLS 8-17-14	8 1/16	16 5/8 *	13 7/8	CP 17-14	77.95
10 INCH HEIGHT					
MCLS 10-17-14	10 1/16	16 5/8 *	13 7/8	CP 17-14	82.75

* NOTE: This size MOD-U-LINE with rack side panels is a perfect fit for 19" wide Modular Vertical Enclosures. See next page. Modular Vertical Enclosures.

MOD-U-LINE SIDE PANELS

PLAIN SIDES			RACK SIDES			HANDLE SIDES		
SIZE INCHES H x D	PART NUMBER	NET PAIR	SIZE INCHES H x D	PART NUMBER	NET PAIR	SIZE INCHES H x D	PART NUMBER	NET PAIR
1 x 7	SPP1-7	$8.85	1 x 7	SPR1-7	$9.25	—	—	—
1 x 9	SPP1-9	8.95	1 x 9	SPR1-9	9.35	—	—	—
2 x 9	SPP2-9	10.35	2 x 9	SPR2-9	11.00	—	—	—
2 x 12	SPP2-12	13.05	2 x 12	SPR2-12	13.95	—	—	—
3 x 7	SPP3-7	10.25	3 x 7	SPR3-7	10.55	3 x 7	SPH3-7	$11.11
3 x 9	SPP3-9	11.35	3 x 9	SPR3-9	12.30	3 x 9	SPH3-9	13.05
3 x 12	SPP3-12	16.20	3 x 12	SPR3-12	16.55	3 x 12	SPH3-12	17.10
3 x 14	SPP3-14	17.10	3 x 14	SPR3-14	17.95	3 x 14	SPH3-14	17.85
5 x 7	SPP5-7	12.60	5 x 7	SPR5-7	13.20	5 x 7	SPH5-7	13.85
5 x 9	SPP5-9	14.60	5 x 9	SPR5-9	15.90	5 x 9	SPH5-9	16.20
5 x 12	SPP5-12	20.55	5 x 12	SPR5-12	21.10	5 x 12	SPH5-12	21.85
5 x 14	SPP5-14	21.75	5 x 14	SPR5-14	23.20	5 x 14	SPH5-14	22.75
7 x 9	SPP7-9	16.50	7 x 9	SPR7-9	16.80	7 x 9	SPH7-9	21.10
7 x 12	SPP7-12	25.05	7 x 12	SPR7-12	26.70	7 x 12	SPH7-12	27.00
7 x 14	SPP7-14	27.20	7 x 14	SPR7-14	22.95	7 x 14	SPH7-14	28.70
8 x 12	SPP8-12	30.45	8 x 12	SPR8-12	30.45	8 x 12	SPH8-12	32.55
8 x 14	SPP8-14	34.05	8 x 14	SPR8-14	34.80	8 x 14	SPH8-14	37.30
10 x 14	SPP10-14	40.85	10 x 14	SPR10-14	41.35	10 x 14	SPH10 - 14	43.65

MOD-U-LINE CHASSIS PLATE

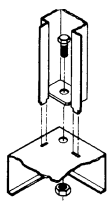
PART NUMBER	WIDTH INCHES	DEPTH INCHES	NET EACH	PART NUMBER	WIDTH INCHES	DEPTH INCHES	NET EACH	PART NUMBER	WIDTH INCHES	DEPTH INCHES	NET EACH
CP-77	6.63	5.12	$9.35	CP-127	11.63	5.12	12.55	CP-177	16.63	5.12	$13.00
CP-89	8.49	7.12	9.35	CP-129	11.63	7.12	14.80	CP-179	16.63	7.12	15.00
CP-97	8.63	5.12	10.90	CP-1212	11.63	10.12	18.50	CP-1712	16.63	10.12	17.30
CP-99	8.63	7.12	11.45	CP-1714	16.63	10.12	20.70				
CP-912	8.63	10.12	14.80								

PFT METAL ENCLOSURES
FORMERLY CTS METAL PRODUCTS

MODULAR VERTICAL ENCLOSURES

MVE SPECIAL FEATURES

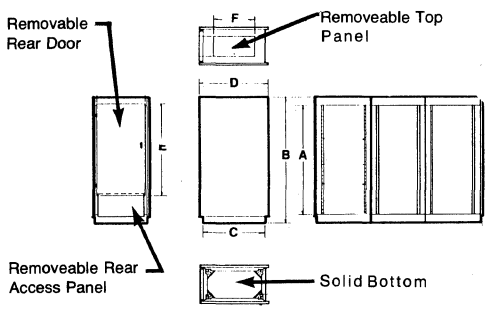
- **Unique Corner Post Design** PFT combines two unique design features to provide strength and rigidity previously associated only with more expensive welded units. Interlocking tab and slot construction in the corner joints eliminates torsional movement of the corner posts. Secondly, a heavy gage mounting plate is welded, slightly recessed, into the top and bottom of each corner post. Thus, when the corner belt is tightened, the cabinet base (or top) flexes slightly, ensuring that the joint is always preloaded in tension, providing additional rigidity.



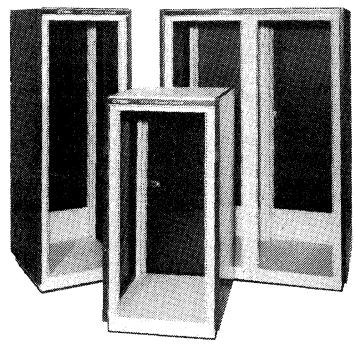
- **Knock Down Units Reduce Shipping Costs.** PFT Modular Enclosures save up to 66% in shipping costs -savings which are passed on to you.

- **Modular Construction Reduces Parts Replacement Costs.** Never replace an entire enclosure again. All PFT cabinet parts, including frame components, are removable, interchangable, and replaceable.

- **Full Line of Accessories.** A full line of accessories to add versatility and to enhance the performance of your vertical enclosures is available. The line includes: plexiglass doors, casters, blower unit, louvers, door locks, drawers and more. Turn to the next page under the **VERTICAL ENCLOSURE ACCESSORIES** heading for a complete list. Note: 17" wide MOD-U-LINE with rack side panels fits 19" vertical enclosures.



Modular Vertical Enclosures are "tough as welded" with the cost savings and versatility of knockdown enclosures.



VERTICAL ENCLOSURE FEATURES

Construction: Heavy duty steel construction ensures durability. Corner Posts - 13 gage C.R.S. Top and bottom assemblies -14 gage C.R.S. All other components - 18 gage C.R.S. All metal forming, welding, and painting is done in PFT manufacturing facilities.

Ease of Assembly: PFT's self-registration design enables quick and routine assembly. One person can assemble these vertical enclosures in minutes. Unique tab and slot engineering ensures all parts accurately self-align.

Colors and Finish: Enclosures are finished with oven-baked, EPA - approved paint. Rear door and side panels have a textured Royal Blue finish. All other components are textured in Ash White. This color combination harmonizes with standard electronics industry products. Other colors are available as modifications.

Multi-Bay Add-Ons: Modular enclosures are designed to bolt together easily and securely to form multi-bay configurations in any quantity. A variety of special multi-bay accessories is available. Turn next page under **VERTICAL ENCLOSURE ACCESSORIES** for a complete list.

Modifications: PFT will make in-plant modifications to your specifications. See next page under the **STANDARD ENCLOSURE MODIFICATIONS** heading for a list of available modifications.

To Order: Select the desired PFT model number from the table, for example: **MVE 19-61-25.** For multi-bay configurations add the appropriate suffix, ie. for **DOUBLE BAY** order: **MVE 19-61-25-2.**

PFT Modular Vertical Enclosure

PART NUMBER	HEIGHT INSIDE A	HEIGHT OUTSIDE B	DEPTH INSIDE C	DEPTH OUTSIDE D	REAR DOOR E	TOP PANEL F	PRICE
MVE-19-42-25	42.125	48.125	25.25	27.25	34.88	20.95	$ 551.20
MVE-19-42-30	42.125	48.125	31.25	33.25	34.88	26.95	583.00
MVE-19-61-25	61.375	67.375	25.25	27.25	54.13	20.95	614.80
MVE-19-61-30	61.375	67.375	31.25	33.25	54.13	26.95	678.40
MVE-19-70-25	70.125	76.125	25.25	27.25	62.88	20.95	657.20
MVE-19-70-30	70.125	76.125	31.25	33.25	62.88	26.95	710.20
MVE-19-61-25-2	61.375	67.375	25.25	27.25	54.13	20.95	1,081.20
MVE-19-61-30-2	61.375	67.375	31.25	33.25	54.13	26.95	1,170.25
MVE-19-70-25-2	70.125	76.125	25.25	27.25	62.88	20.95	1,137.40
MVE-19-70-30-2	70.125	76.125	31.25	33.25	62.88	26.95	1,215.95
MVE-19-61-25-3	61.375	67.375	25.25	27.25	54.13	20.95	1,547.75
MVE-19-61-30-3	61.375	67.375	31.25	33.25	54.13	26.95	1,662.30
MVE-19-70-25-3	70.125	76.125	25.25	27.25	62.88	20.95	1,617.80
MVE-19-70-30-3	70.125	76.125	31.25	33.25	62.88	26.95	1,722.70

EXAMPLE: Single Bay = MVE-19-61-25; Double Bay = MVE-19-61-25-2

YOUR MVE INCLUDES:

- Four corner posts *per bay*
- One top assembly *per bay*
- One top access panel *per bay*
- One closed bottom assembly *per bay*
- One rear door *per bay*
- One rear access panel *per bay*
- Two removable side panels
- Mounting hardware

Note: PFT MVEs may be ordered without all these standard accessories. Call for prices.

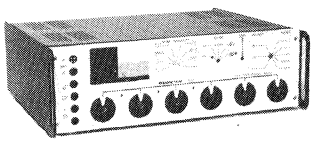
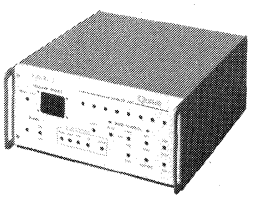
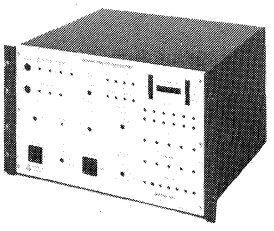
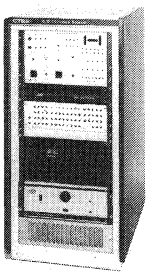
PFT METAL ENCLOSURES
FORMERLY CTS METAL PRODUCTS

STANDARD ENCLOSURE MODIFICATIONS

PFT can save you valuable time and money by modifying its entire line of standard enclosures [MOD-U-BOX, MOD-U-LINE, or MODULAR VERTICAL] to your specifications. In its manufacturing facilities, PFT can perform a wide variety of modifications for you under one roof, at competitive prices. Call for more information.

Modifications now available include:

- Custom Colors
- Smooth or Textured Paints
- Multicolor Silkscreening
- Cut-Outs
- Knockouts
- Punched Holes
- Louvers
- Vent Slots
- Double "D"
- Standoffs
- Pem Nuts
- Studs

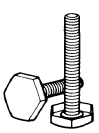
VERTICAL ENCLOSURE ACCESSORIES

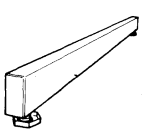
PFT offers a full line of accessories to enhance the performance and versatility of your vertical enclosures.

BASE ACCESSORIES

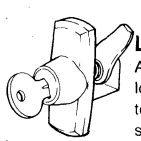
Casters
3 ½" diameter swivel casters plus assembly handware. These hard rubber casters are rated for 200 pounds each. 4 per set.
MVE 1010 **$36.60/set**

Leg Levelers
3" independently adjustable leg levelers for stabilizing units placed on uneven floor surfaces. 4 per set.
MVE 1015 **$7.95/set**



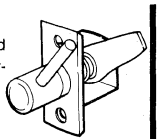
Anti-tilt Legs
Anti-tilt legs are available in PFT Royal Blue. Legs are tubular constructed with protective plastic caps and easily attach to the base of the cabinet. Assembly hardware included.

37" **MVE 1020** **$55.15/pair**
43" **MVE 1021** **$66.80/pair**

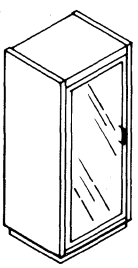
DOOR ACCESSORIES



Lock Assembly
Adjustable grip latch with key lock capabilities to limit access to the interior of your enclosure.
MVE 1030 **$15.90**

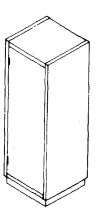
T-Door Handle
PFT offers zinc plated, knurled head/T-bar handles for all Vertical Cabinet models.
MVE 1035 **$7.95**





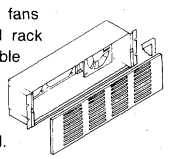
Plexiglass Door:
Smoked grey plexiglass door has a satin anodized aluminum extruded frame. Magnetic closure strip and handle allow easy access and secure closure.
42" **MVE 1092** **$196.10**
61" **MVE 1090** **$205.65**
70" **MVE 1091** **$229.00**

Steel Front Door:
18 gage C.R.S. door is finished in oven-baked, textured Royal Blue. Lock and handle ensure secure access. All mounting hardware is included.
42" **MVE 1185** **$126.15**
61" **MVE 1175** **$142.05**
70" **MVE 1180** **$159.00**

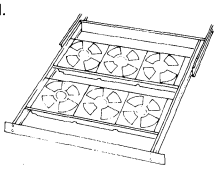


VENTILATION ACCESSORIES

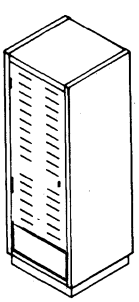
Blower Unit:
Three 15 W, 109 CFM fans housed in a zinc-plated rack mount enclosure. Washable air filter is protected by a bright nickel plated grille. All mounting hardware is included.
MVE 1115 **$222.60**



630 CFM Blower
Utilizing just 1 ¾" vertical panel space, this tray blower features six 105 CFM precision ball-bearing fans. Blower mounts to EIA spaced holes in corner posts or tapped rails. Zinc plated housing, six foot long 115V power cord. All hardware included.

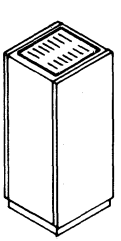


Part Number: **MVE 1120** **$381.60**



Louvered Rear Door:
18 gage C.R.S. door is finished with oven-baked textured Royal Blue. Two columns of louvers allow fresh air flow.
42" **MVE 1131** **$ 92.25**
61" **MVE 1125** **$106.00**
70" **MVE 1130** **$118.75**

Louvered Top Panel:
18 gage C.R.S. panel is finished in oven-baked textured Ash White paint. Top panel is formed to lie flush and mounts with four screws, which are included.
25" deep
MVE 1140 **$36.05**
30" deep
MVE 1145 **$39.25**

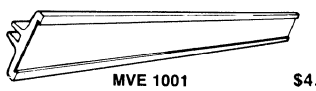


PFT METAL ENCLOSURES
FORMERLY CTS METAL PRODUCTS

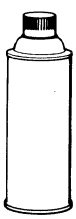
VERTICAL ENCLOSURE ACCESSORIES CONT'D

COSMETIC FINISHES

Identification Strip
The PFT Identification Strip is manufactured with a finish to match your Vertical Enclosure. This strip fits neatly into the aluminum trim which is a standard part of all Vertical Cabinets. This item is also available with your logo or corporate name for a slightly additional charge.



MVE 1001 **$4.80**
use with single bay units
MVE 1002 **$7.95**
use with double bay units
MVE 1003 **$11.15**
use with triple bay units.



Touch Up Paint
Touch up paint is available to provide a compatible finish. Paint comes in 12 oz., air dry cans.

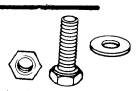
MVE 1040 **$14.35**
Royal Blue
MVE 1041 **$14.35**
Ash White

Flat Filler Panels
.125" Aluminum flat panels finished in textured Ash White. Six sizes.

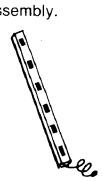
PART NUMBER	APPROX. HEIGHT	ACTUAL HEIGHT	ACTUAL WIDTH	COST $
MVE 1200	1.75	1.71	19.00	6.40
MVE 1201	3.50	3.46	19.00	7.95
MVE 1202	5.25	5.21	19.00	11.15
MVE 1203	7.00	6.96	19.00	12.75
MVE 1204	8.75	8.71	19.00	15.90
MVE 1205	10.50	10.48	19.00	19.10

MULTI-BAY ACCESSORIES

Joining Kit
Complete hardware is available for joining units to form multi-bay capacities. Kit includes bolts, nuts, flat and lock washers to complete assembly.



MVE 1045 **$4.80**

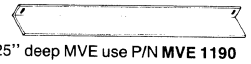


60" Power Strip:
Contains **10** single, 125V, grounded outlet receptacles on 6" centers. UL listed and rated for 15 amps. A 6' cord with ground is attached. All mounting hardware is included.

MVE 1135 **$102.85**

MOUNTING HARDWARE

Equipment Mounting Angles
Zinc plated with a gold chromate finish 11 gage steel mounting angles rated for 200 lbs. each. Obround holes and hardware (included) enable mounting to corner post sides. Angles measure 1.50" high x 4.00" wide. Two per kit.

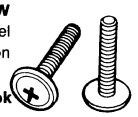


For 25" deep MVE use P/N **MVE 1190** **$17.00**
For 30" deep MVE use P/N **MVE 1195** **$20.15**

5/8" Cup Head Screw
10/32 Phillips washer head panel mounting screw with nylon washer. 20 per pack.

MVE 1049 **$3.20 /pk**

1 1/8" Cup Head Screw
10/32 Phillips washer head panel mounting screw with nylon washer. 20 per pack.



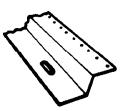
MVE 1046 **$3.20 /pk**

Clip Nut
10/32 Plated "U" type clip nut to be used with panel mounting screws. 20 per pack.

MVE 1047 **$4.80 /pk**

Cage Nut
10/32 Plated "U" type clip nut to be used with panel mounting screws. 20 per pack.

MVE 1048 **$12.75 /pk**

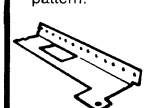


Multi-Formed Vertical Mounting Rail Kit
Each kit contains two 12 ga. steel zinc plate, gold irridite rails. These can be used when necessary to install equipment horizontally into cabinet. Each rail is drilled and tapped with 10/32 holes using the standard EIA pattern. All necessary installation hardware is included.

42" **MVE 1082** **$42.40 pr.**
61" **MVE 1080** **$46.65 pr.**
70" **MVE 1081** **$51.95 pr.**

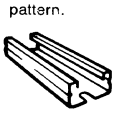
90 Degree Vertical Mounting Rail Kit
Packed two per kit with all necessary installation hardware. Kit contains two 12 ga. steel rails. Rails attach to horizontal mounting kit inside of cabinet and are used to recess equipment inside of cabinet. Each rail is drilled and tapped with 10/32 holes using the standard EIA pattern.

42" **MVE 1077** **$37.10 pr.**
61" **MVE 1075** **$39.25 pr.**
70" **MVE 1076** **$42.40 pr.**



Vertical Corner Mounting Rail Kit
Vertical corner mounting rails are packed two per kit and include all necessary installation hardware. Rails attach directly behind corner post and provide a continuous height of 10/32 tapped holes utilizing the standard EIA pattern.

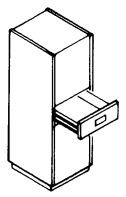
42" **MVE 1062** **$37.10**
61" **MVE 1060** **$40.30**
70" **MVE 1061** **$43.50**



Horizontal Mounting Rail Kit
Each kit contains two 16 ga. steel rails with a zinc plate, gold irridite finish. Rails attach to 90 degree vertical mounting rails and multiformed vertical mounting rails. All hardware is included.

25" **MVE 1070** **$24.40**
30" **MVE 1071** **$26.50**

DRAWERS AND SHELVING

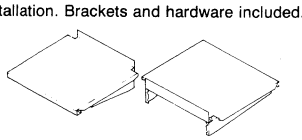


Drawer Assembly:
18 gage C.R.S. drawers are rated for a 200 lbs. load. Drawers mount on 14 gage zinc-plated C.R.S. brackets with ball bearing slides. Front panel is oven-baked textured Ash White, all other surfaces are smooth Ash White. Stainless steel pull is flush mounted in front panel. Drawer measures H x W x D = 6" x 16 1/8" x 16"

7" panel **MVE 1155** **$159.00**
10½"panel **MVE 1160** **$164.30**

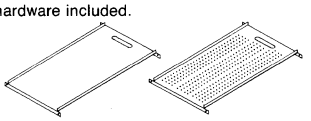
Note: All mounting hardware is included.

Fixed Writing Shelf
Smooth ash white 16 gage cold rolled steel shelf measures 22.00" wide by 16.25" deep and is rated for more than 200 pound loads. 14 gage CRS brackets mount to EIA spaced holes in MVE corner posts. Uses 6" of panel mounting height. Brackets must be assembled to shelf prior to installation. Brackets and hardware included.

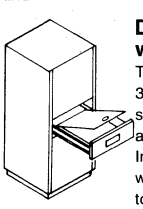


Part Number: **MVE 1147** **$79.50**

Equipment Shelves: Solid and Perforated
Sixteen gage steel shelves are rated for 200 lb. loads. A 1" x 6" obround cable opening is 2" from rear of shelf. Eleven gage 1" x 19" mounting flanges are welded to shelf front and rear for mounting to the four MVE corner posts. Perforated shelves have three 5" wide bands of .25" diamond-shaped perfs on .50" center to maximize cabinet air flow. Shelves are finished in oven baked smooth ash white paint. Mounting hardware included.



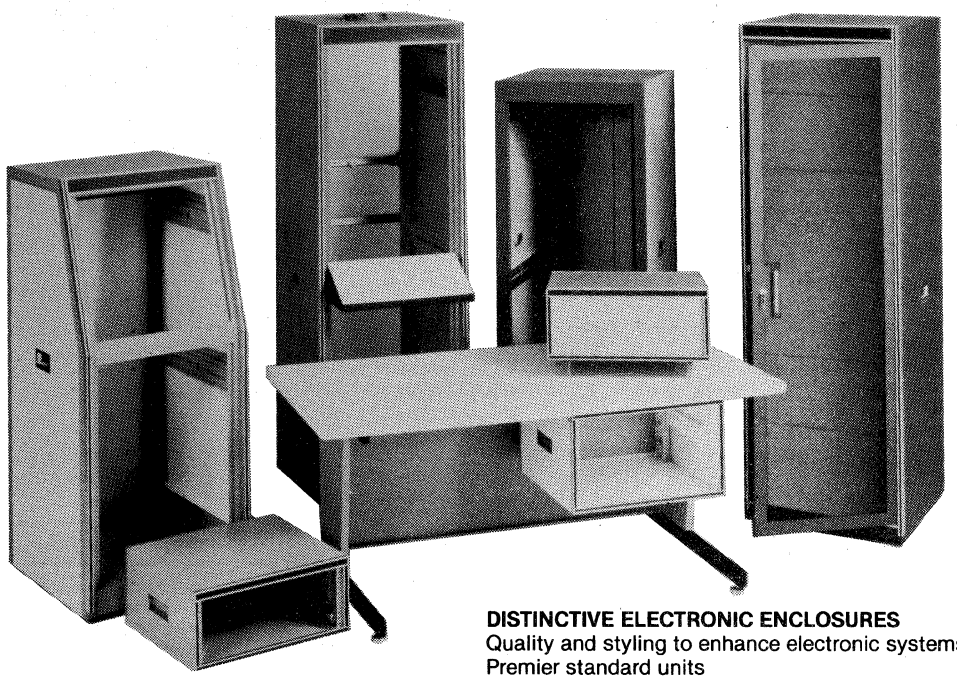
PART NUMBER	TYPE	DEPTH	WIDTH	CABINET DEPTH	COST $
MVE 1165	Solid	24.50	17.72	25"	33.95
MVE 1168	Perforated	24.50	17.72	25"	42.40
MVE 1170	Solid	30.50	17.72	30"	44.55
MVE 1171	Perforated	30.50	17.72	30"	53.00



Drawer Assembly w/Writing Shelf:
This drawer assembly with a 3½" high front panel, has the same construction and finish as the drawer described above. In addition, an 18 gage C.R.S. writing shelf has been attached to the back of the drawer. The shelf may be raised on its hinges to allow access to the drawer. The writing shelf is finished in smooth Ash White paint. All mounting hardware is included. The drawer dimensions, H x W x D, are: 2 11/16" x 16 1/8" x 16".

MVE 1150 **$150.00**

PREMIER CABINETS



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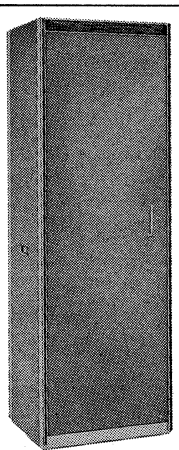
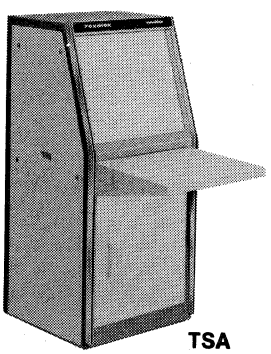
Quality and styling to enhance electronic systems using Premier standard units



TVA



TSA

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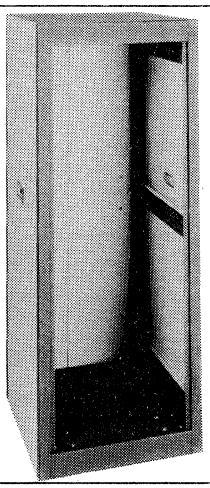

SVA

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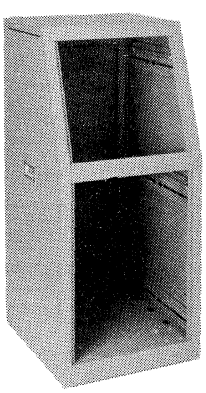
19" and 24" (EIA) Standard Rack Widths

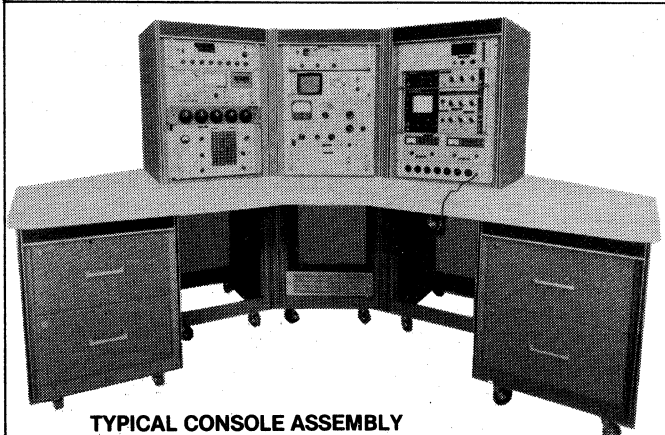
7 Panel Heights from 21" to 77"

4 Depths from 18" to 30"

Available in 64 sizes



SSA



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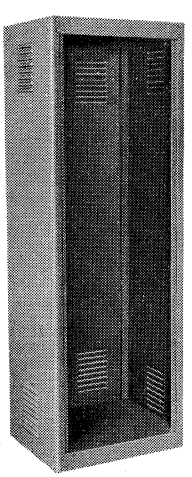
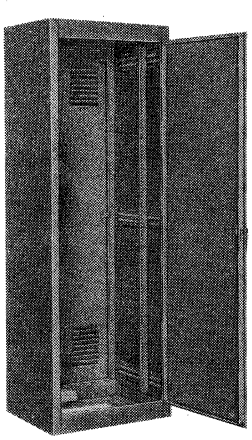
Combinations of standard cabinets and accessories offer an endless variety of easily assembled systems for specialized applications.



R SERIES

RMX, FDX & R SERIES
Solid side skin cabinets for economical applications. RMX & FDX are welded units, R series are knock-down units.



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Premier Enclosures offer maximum flexibility, adaptability and esthetic values. The extensive range of standard units in various widths, depths, heights and shapes available, offer the variety of combinations and configurations necessary for modern packaging systems.

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Trimline Instrument Cases & Accessories
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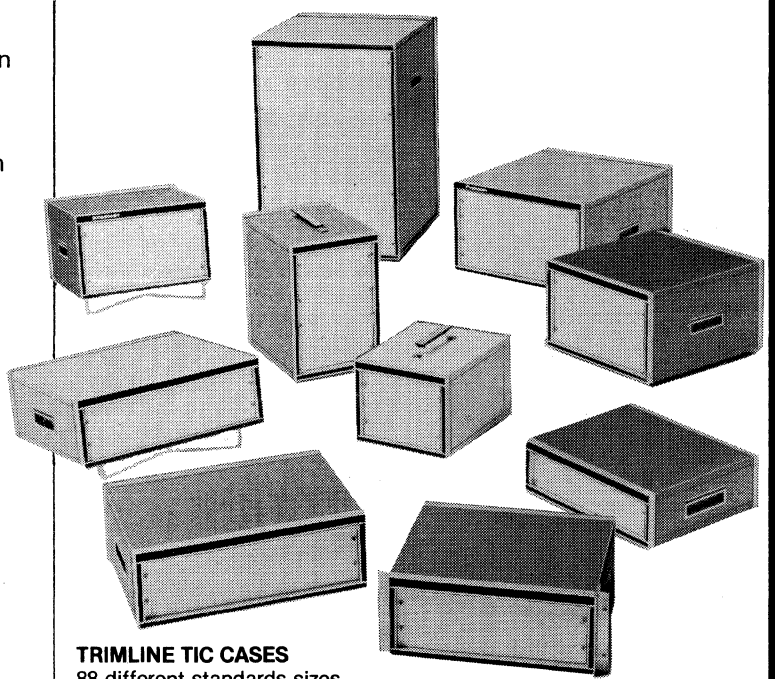
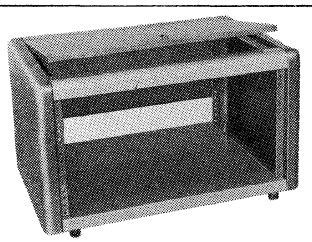
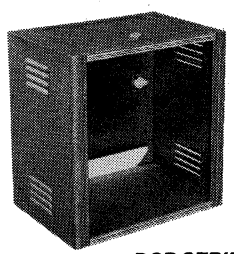


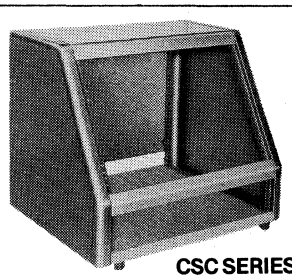
TRIMLINE TIC CASES
88 different standards sizes
11 panel heights, 3 depths, 3 widths.



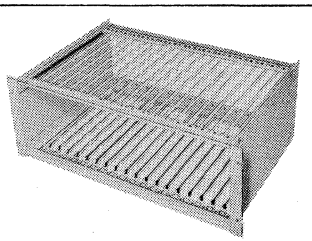
POR SERIES



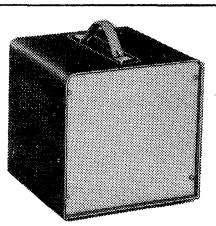
DCR SERIES



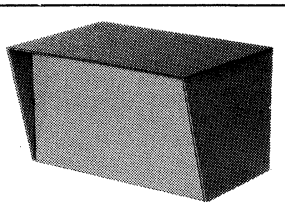
CSC SERIES



PCH SERIES



CC SERIES



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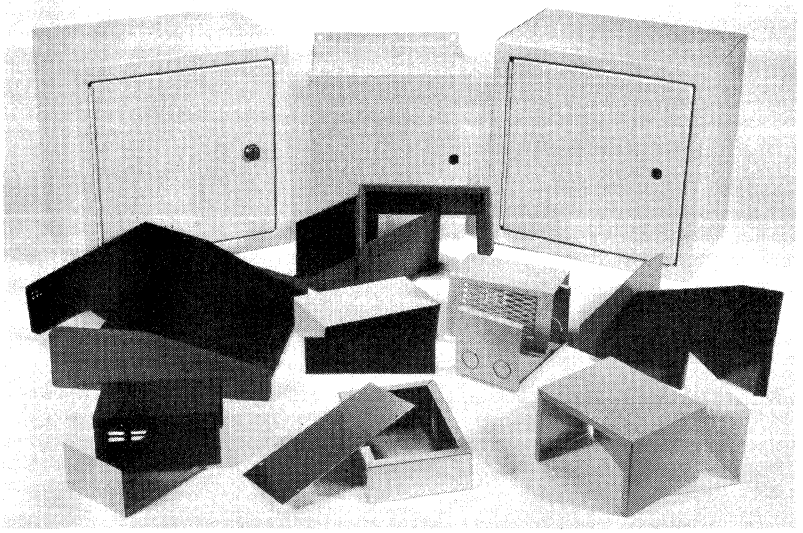

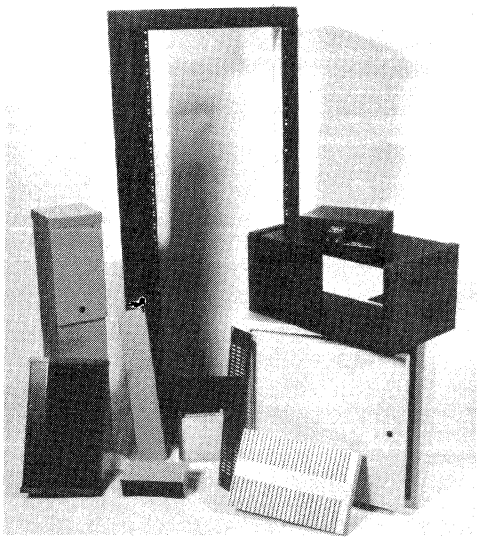

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PHOSPHATE COATING
changes the metal to a different chemical composition on its surface to ward off corrosion and help bond coating to the metal.

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the surface of the aluminum is etched by a chemical reaction in order to roughen the surface for coating adhesion.

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- Air
- Airless
- Hot Airless
- Electrostatic

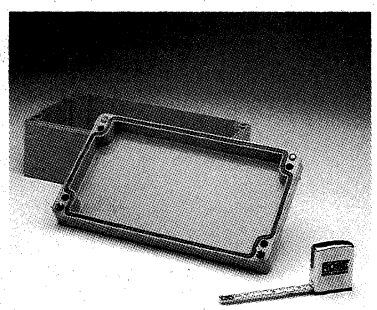
TYPES OF PAINT
- Baking Enamels
- Urethanes (1 and 2 part)
- Polyamides
- Lacquers
- Chromates
- Air Dry Enamels

SILK SCREENING

TYPES OF MATERIAL SCREENED
- Metals
- Aluminum
- Acrylics
- Vinyls

TYPES OF INK
- Baking epoxy for chemical resistance
- Air cure epoxy (2 part) for indoor use
- Lacquers
- Enamels
- Plasti-Vac for long term outdoor use on acrylics
- Metallic Inks

Maximum Protection, Maximum Selection



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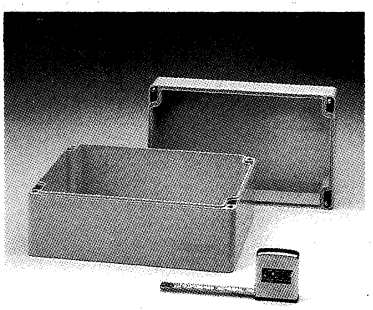
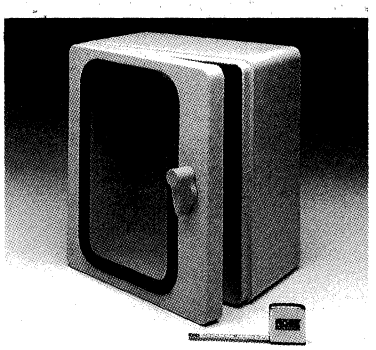
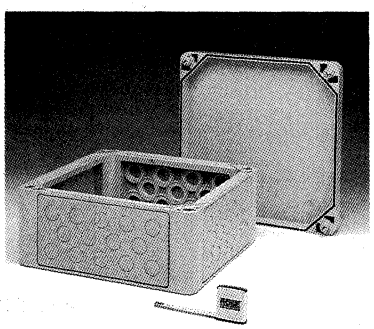
- EMI/RFI gaskets available



Non-Metallic Enclosures
- Fiberglass, polycarbonate or ABS
- Molded-in mounting bosses for PCBs
- Watertight
- Clear lids available on some models



NEMA Type 4X Cabinets
- Fiberglass or ABS
- Clear or windowed doors
- Watertight
- 6 lock/latch styles



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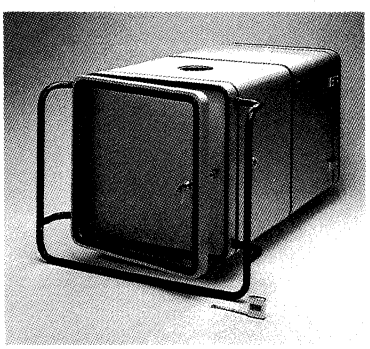
- Fiberglass or ABS
- No assembly hardware required
- NEMA 4X and NEMA 1 versions
- Removable side walls



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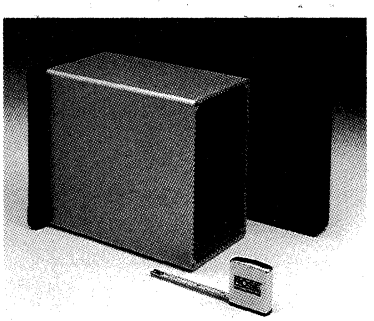

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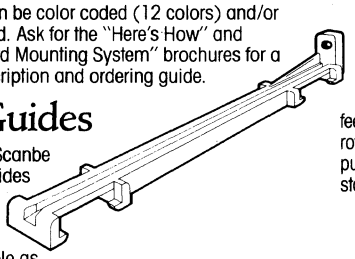
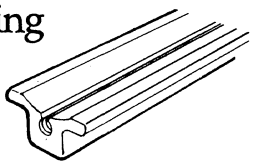
Card Guides



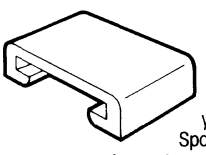
The patented Scanbe "T" series guides have integral connector mounting feet or are available as Thru-Guides for separate connector mounting components. Lengths 2.750" to 12.815". Also Snap-In Guides 2.500" to 12.000".

Mounting Bars



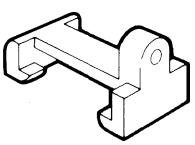
For "T" Series Guides and "A" Series mounting feet, up to 24" length, for single and multiple card rows. For Snap-In guides mounting bars are prepunched with .5, .6, .7 or .75" centers. 17" length standard, but can be cut to length.

Spacers



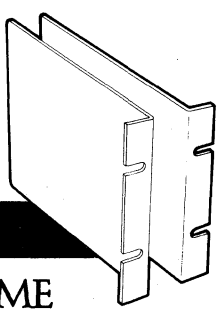
Adjust the nominal .500" width of "T" Series card guides to your card spacing. Spacers 0.031" to 1.000" for card spacing 0.531" to 1.500".

Connector Mounting



Thru-hole or with 4-40 threaded brass or stainless steel inserts. Available as "A" Series nylon mounting feet that slide on mounting bars, or as a connector mounting bar for high insertion force connectors.

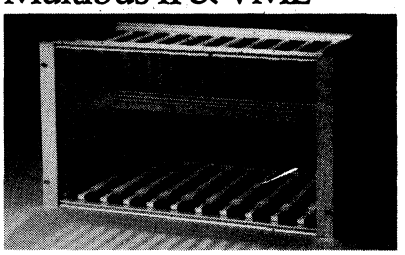
End Plates



Mate with mounting bars and provide ears for rack or panel mounting. Heights 5.22" to 17.47", depths 8.25" to 11.25".

CARD CAGES

Multibus II & VME

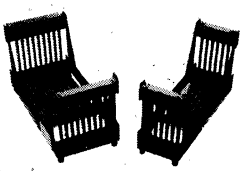


Scanbe's Eurocard cages come in hundreds of combinations from 3U to 9U heights, 100mm to 400mm depths, and from 3 to 21 slots. Universal mount, vertical rack mount and horizontal rack mount are available.

For VMEbus or Multibus II, high quality J1 backplanes are installed and tested—J2 backplanes are optional.

Multibus I

The MICRO-FILE™ line of Multibus cages is available with 4 to 26 slots, with or without low noise backplanes, and in universal mount, vertical rack mount or horizontal rack mount.



INJECTORS/EJECTORS

Scanbe circuit card ejectors fit virtually all card support systems. They easily attach by means of roll pins to cards either 0.062" or 0.093" thickness, and operate by lever action against the card guide or mounting bar.

Styles:

S-200	Single action, .375" wide
S-202	Slim line single action, .250" wide
S-203	Low profile (.125") single action
S-205	Single action, offset
S-206	Locking ejector for "T" series guides
S-208	Low profile tabbed
S-209	Double action injector/ejector
S-211	Single action, medium length
S-212	Single action, for larger cards
S-213	Ultra long for maximum leverage
S-214	Double action for sheet metal cage
S-216	E-Z-Ject VME panel ejector
S-217	Eurocard injector/ejector

E-Z-JECT VME Ejectors and Panels

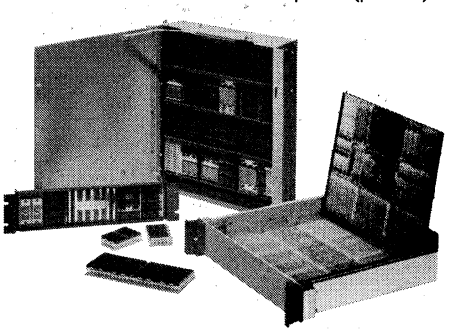
The Scanbe E-Z-Ject™ has become the industry standard ejector for VMEbus boards, providing a quick and easy method of removal from Eurocard format card cages. The standard E-Z-Ject front panel assembly includes the front panel, the handle(s), and the corresponding hardware. Custom panel labeling as well as custom ID panels for E-Z-Ject handles are readily available.

Size	Order No. Unassembled	Assembled
3U x 4HP	32025	32005
6U x 4HP (lower bracket)	32030	32010
6U x 4HP (upper bracket)	32028	32027
6U x 8HP (std.)	32094	32091
6U x 8HP (wire wrap)	32152	32011
9U x 4HP	32035	32014
9U x 8HP (wire wrap)	32153	32128
9U x 8HP (deep comp.)	32226	32186

WIRE WRAP

Scanbe has full wire wrap capability from initial design through NC wire and assembly, packaging, test and documentation. Find out how complete Scanbe service can save time and cut cost in your application.

Wire wrap boards are available for Multibus, VME, the 3D series of 6.25x5.56" boards, and in the 2D series socket boards and panels (pictured).



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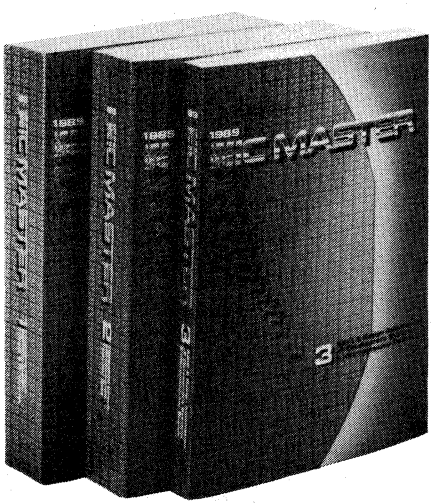

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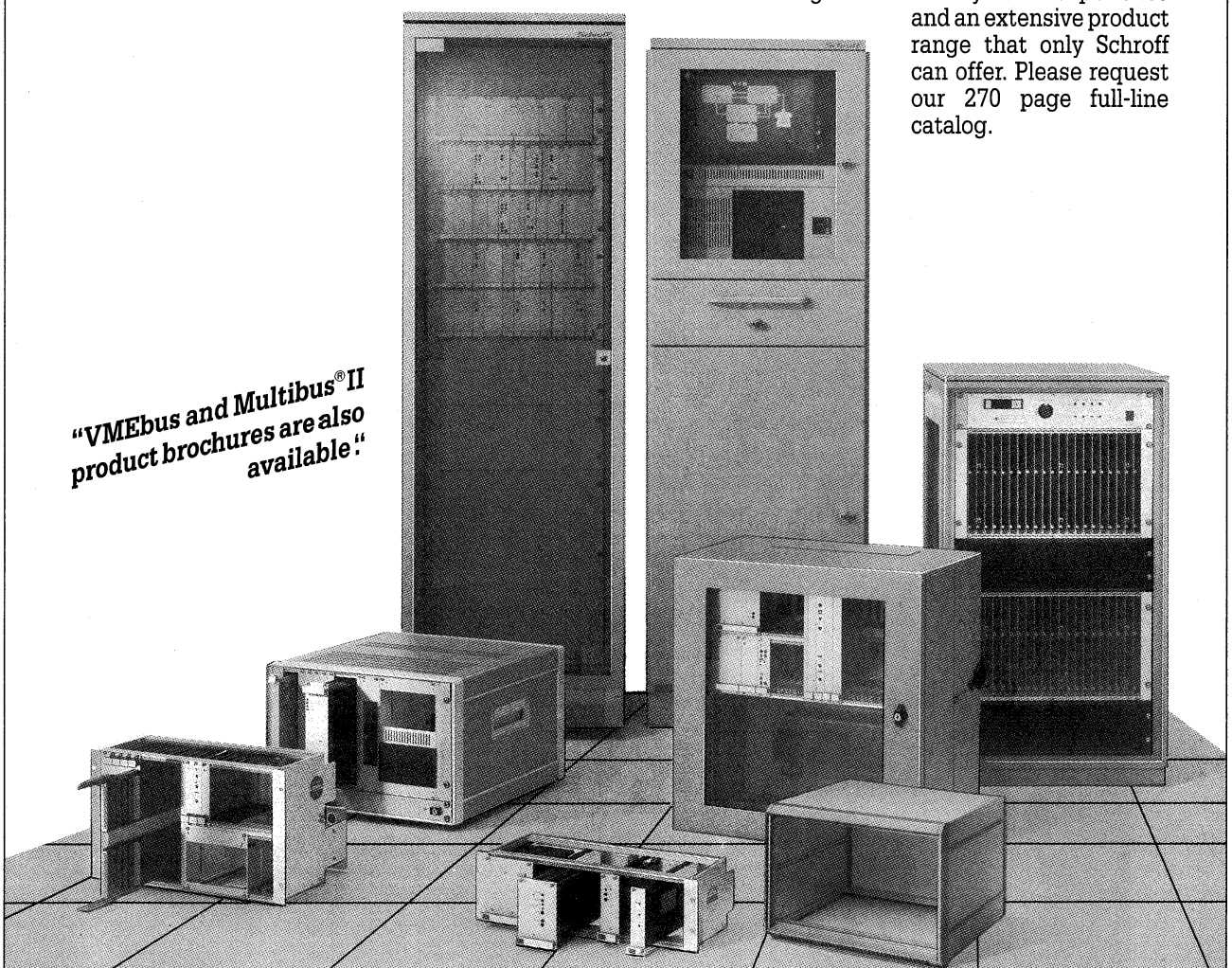

"VMEbus and Multibus® II product brochures are also available."

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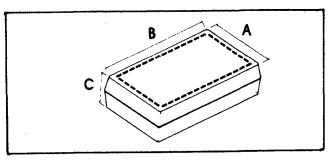
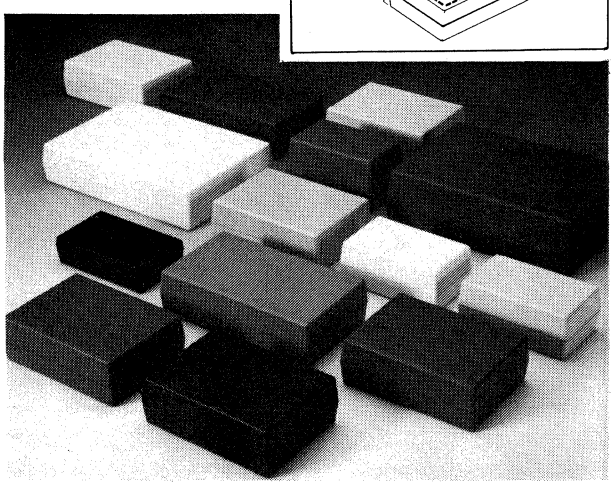
Selection:

Serpac's™ wide variety of packaging products provide functional utility and a professional high-tech appearance. Choose from an inventory of 29 enclosures in 9 colors (almond, black, blue, gray, green, orange, red, white and yellow). We offer models with or without 9 volt battery compartments. All models come with vertical card guides and are bossed for mounting horizontal circuit cards. We also offer our **"I series"** which has inserting capabilities. **Serpac** can customize a standard enclosure to meet your needs and minimize cost of modifications.

Dotted line indicates I-Series





Quality:

Using UL rated high-impact ABS with a scratch resistant grain finish, **Serpac** professional packaging delivers durability and designer styling. There is no paint or veneer to chip or crack, **each color is molded-through,** providing you with enclosures that are ideal for a wide range of applications.

Custom Options:

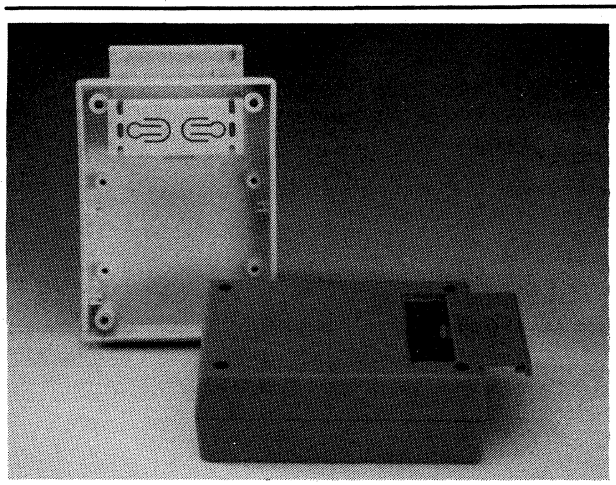
Serpac has the design expertise plus the tooling, machining and injection molding capabilities to provide a complete custom packaging service.
We can modify existing enclosures by machining.

OR

The **"I Series"** offers you the option to build your own customized enclosure at a fraction of normal tooling costs and reduced delivery time. You save even more through reduced assembly time and labor.

Standard Enclosures

MODEL NO.	USABLE INSIDE DIMENSION A		B		C	VERTICAL CARD POSITION	MOUNTING BOSSES
110-I	1.875	x	.890	2	4		
111	1.875	x	3.25	x	1.25	2	4
131	2.75	x	4	x	1.25	3	4
131-I	2.75	x	4	x	1.25	3	4
151	2.75	x	5.25	x	1.25	4	4
151-I	2.75	x	5.25	x	1.25	4	4
171	4.5	x	6.5	x	1.25	5	8
171-I	4.5	x	6.5	x	1.25	5	8
112	1.875	x	3.25	x	1.75	2	4
132	2.75	x	4	x	1.75	3	4
152	2.75	x	5.25	x	1.75	4	4
172	4.5	x	6.5	x	1.75	5	8
113	1.875	x	3.25	x	2.25	2	4
133	2.75	x	4	x	2.25	3	4
153	2.75	x	5.25	x	2.25	4	4
173	4.5	x	6.5	x	2.25	5	8



9 Volts Enclosures

MODEL NO.	USABLE INSIDE DIMENSION A		B		C	VERTICAL CARD POSITION	MOUNTING BOSSES
211	2.4	x	2.75	x	1.25	1	4
231	2.75	x	3	x	1.25	2	4
231-I	2.75	x	3	x	1.25	2	4
251	2.75	x	4.25	x	1.25	3	4
251-I	2.75	x	4.25	x	1.25	3	4
271	4.5	x	5.5	x	1.25	4	6
271-I	4.5	x	5.5	x	1.25	4	6
232	2.75	x	3	x	1.75	2	4
252	2.75	x	4.25	x	1.75	3	4
272	4.5	x	5.5	x	1.75	4	6
233	2.75	x	3	x	2.25	2	4
253	2.75	x	4.25	x	2.25	3	4
273	4.5	x	5.5	x	2.25	4	6

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PRODUCTS DIVISION
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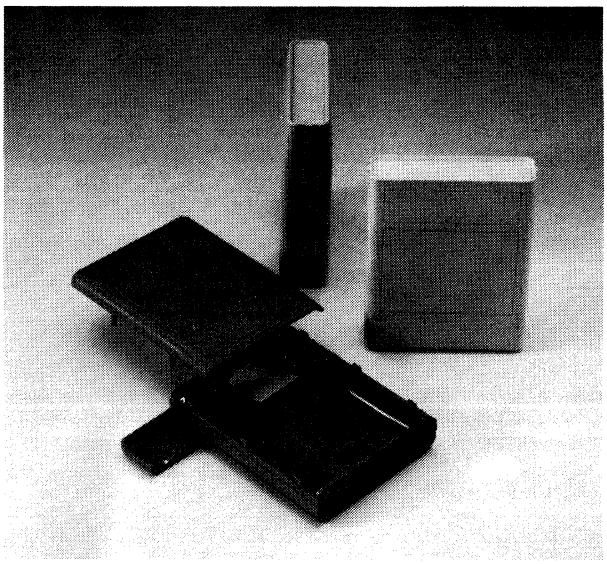

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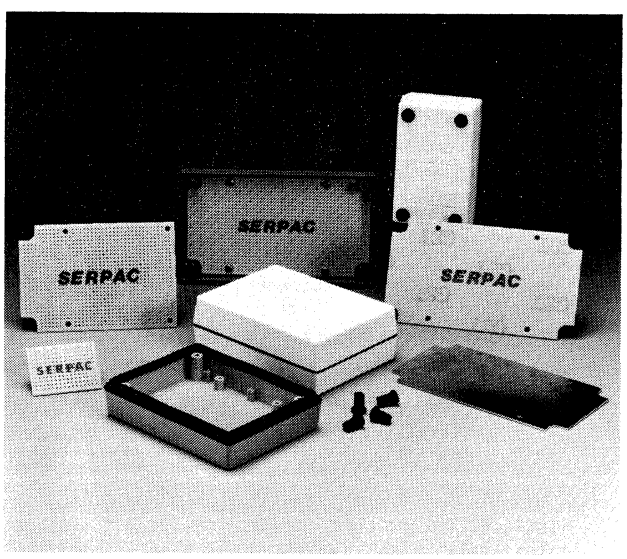
Plastic Electronic Enclosures

M-Series:

The M-Series enclosures with its patented no-screw locking system and new design are now available. Each enclosure has a molded through scratch resistant grain finish in 5 colors (almond, black, blue, gray and white). Inserted area on top for customizing enclosures. The front panel is removable (custom panels are available). The M-4 has a double AA battery compartment, and the M-6 is either double AA or 9 volt battery compartment. Pocket clips are options for both models.

MODEL NO.	A		B		C
M-4	2.20	x	2.80	x	0.70
M-6	2.40	x	4.150	x	.850

Accessories:



Standard Horizontal Grid and Clad Boards

MODEL NO. GRID BOARD	MODEL NO. CLAD BOARD	FITS ENCLOSURE NUMBER
310	410	111, 112, 113
330	430	131, 132, 133
350	450	151, 152, 153
370	470	171, 172, 173

9 Volts Horizontal Grid and Clad Boards

MODEL NO. GRID BOARD	MODEL NO. CLAD BOARD	FITS ENCLOSURE NUMBER
319	419	211
339	439	231, 232, 233
359	459	251, 252, 253
379	479	271, 272, 273

Serpac Non Skid Feet: Mount on the bottom of your enclosure for table top applications.

Elastomer Non-Skid Feet

MODEL NO.	FITS ALL ENCLOSURES
50	4/PACKAGE

Vertical Grid and Clad Boards

MODEL NO. GRID BOARD	MODEL NO. CLAD BOARD	FITS ENCLOSURE NUMBER
311	411	111
331	431	131, 151, 231, 251
371	471	171, 271
312	412	112
332	432	132, 152, 232, 252
372	472	172, 272
313	413	113
333	433	133, 153, 233, 253
373	473	173, 273

Perimeter Seal: Used in conjunction with our standard enclosures, the perimeter seal kit will provide an effective barrier from an aqueous environment.

Perimeter Seal

KIT NO.	FITS ENCLOSURE NUMBER
PS-11	111, 112, 113
PS-13	131, 132, 133
PS-15	151, 152, 153

M-Series Accessories:

Front Panels
M-4 FP, M-6 FP
Pocket Clip

Colors
Deep Violet, Clear, Red

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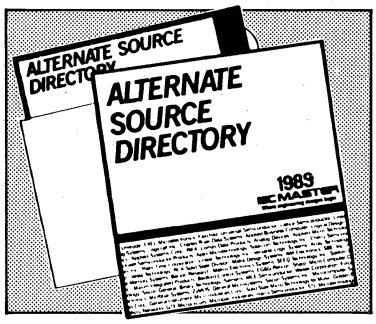

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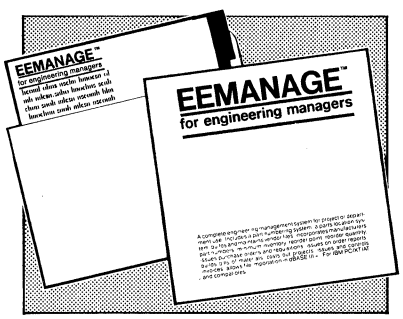

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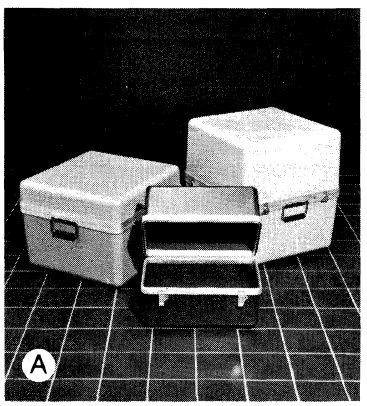
- Custom foam interior available

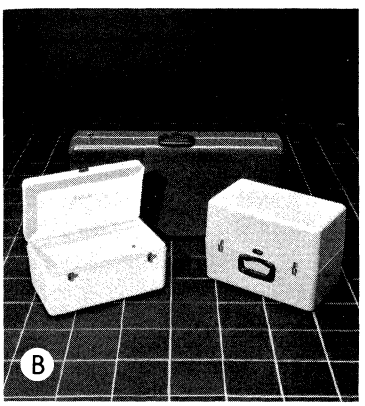
Standard Econoglass™ Cases (B)
All the rugged structural features of standard fiberglass at an economical price. Has standard mounting clips for easy panel installation.

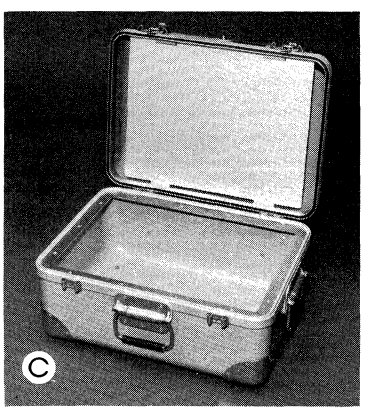
Standard Mounting Flange Cases (C)
Versatile standard fiberglass cases that allow you to adopt display or test equipment to field use through a built-in mounting flange in the edge frame. Over 35 sizes available.
- Pre-drilled flange has captive floating nuts
- Can be RFI/EMI shielded
- Flange can be gasketed
- Standard panels available
- Many accessories can be specified

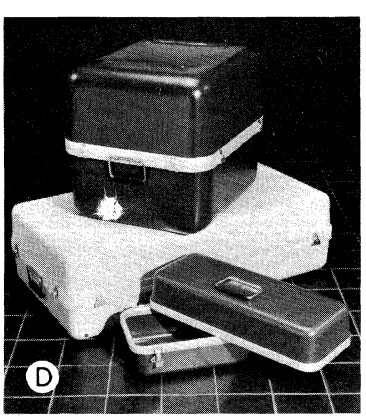
Standard ABS Thermoplastic Cases (D)
Combine high strength with light weight in commercial hand-portable shipping containers. Easily modified. Over 35 sizes.
- High energy absorption capability
- Extremely high ductility
- Wide temperature range characteristics
- Some models feature stacking ribs
- Custom foam interiors available

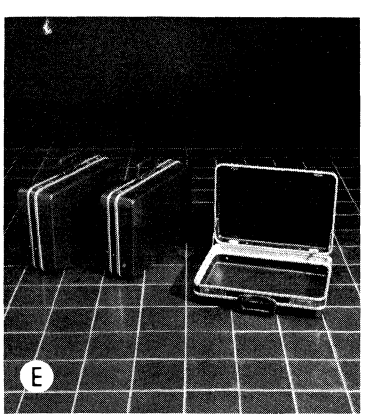
Standard ABS Industro-Cases™ (E)
Thermoplastic cases in a briefcase style design. Excellent sales sample and service kit container. Three versatile sizes.











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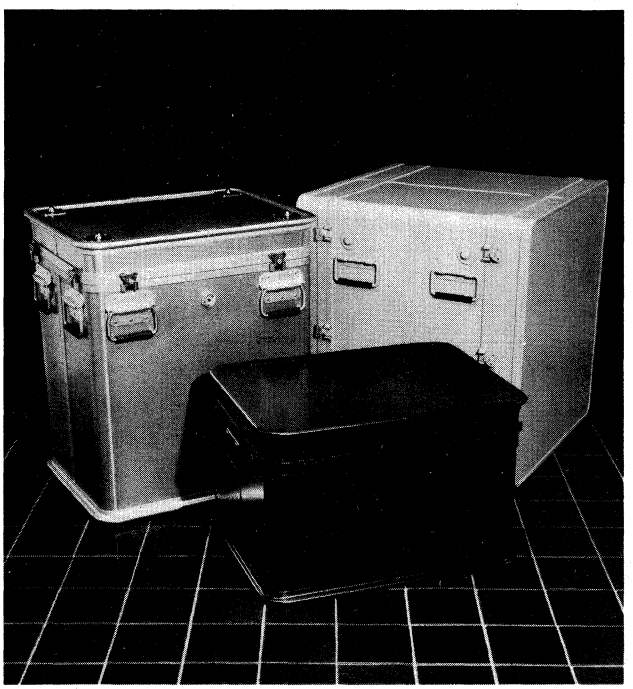
Quality Protection for Advanced Technology

Aluminum Composite and Aluminum Panel Cases and Containers

Aluminum Composite Panel Containers

As an originator of the bonded sandwich panel, Skydyne has had many years of experience working with this versatile, unique material. It has proven to be particularly adaptable to protective combination-type containers for both transit and operational use. For oversized or heavy objects, such containers are especially advantageous. Virtually any size structure can be made without costly tooling costs. The features of sandwich structures include:

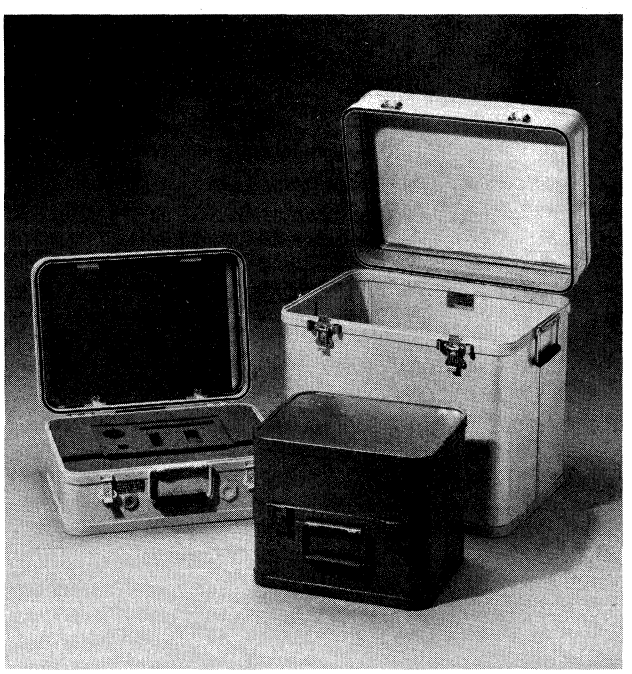
- Designs to meet applicable MIL specifications
- Outstanding strength-to-weight ratio
- Water/weather resistance
- Available in virtually any configuration
- Easily adapted to special equipment mounts
- Many accessory items available



Modular Aluminum Panel Cases

If all-metal construction is a must for your application, Skydyne offers a complete line of all aluminum cases. The modular panel construction offers more ruggedness with better impact resistance than typical drawn metal types.

- Meets many MIL specifications
- Gasketed closures
- High thermal conductivity
- Treated for corrosion resistance
- Sizes from 5" x 5" x 5" to 9' x 2' x 6'
- Many custom features available



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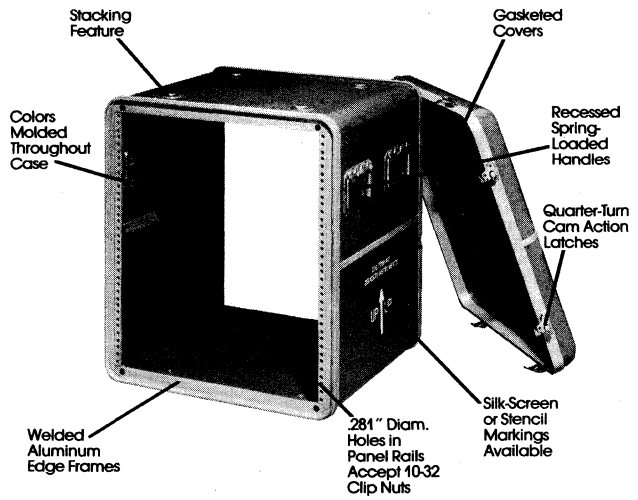
Rigid or Shock-Isolated Rack Mount Cases and Containers

Fiberglass Construction

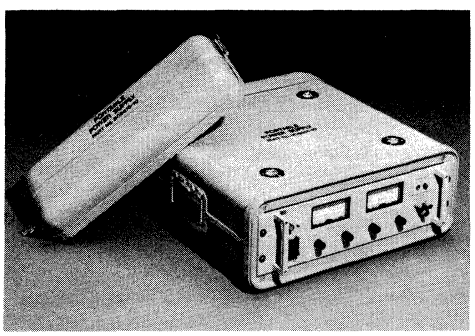
- Standard EIA sizes
- Extremely lightweight
- High strength-to-weight ratio
- High resistance to impact
- High thermal shock resistance
- Inert to most chemicals
- Choice of hard- or shock-mount



Size Range

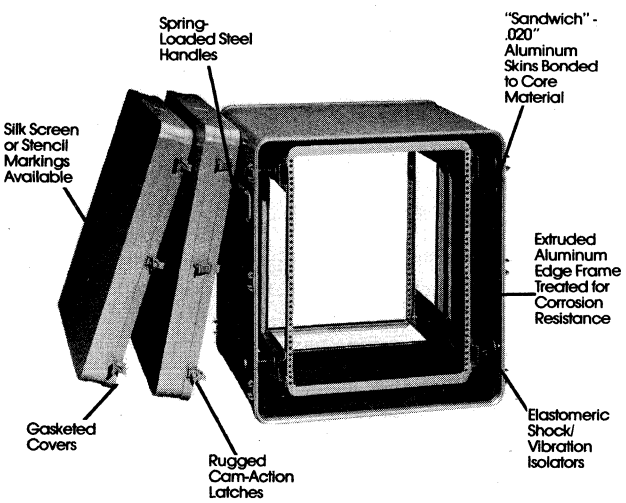
*EIA DESIGNATION	INSIDE RACK DIMENSION (in.)		
	H	W	D
3U	5.37	17.75	18.47
4U	7.12	17.75	18.47
5U	8.87	17.75	18.47
6U	10.62	17.75	18.47
7U	12.37	17.75	18.47
8U	14.12	17.75	18.47
9U	15.87	17.75	18.47
10U	17.62	17.75	18.47
11U	19.37	17.75	18.47
12U	21.12	17.75	18.47

Note 1: Shock-isolated sizes to 10U height.
Note 2: Consult factory for additional sizes.
*EIA: Electronic Industries Association



Composite Panel Construction

- Rugged aluminum sandwich panel walls
- Choice of core materials:
  - aluminum honeycomb
  - foam
  - basswood/plywood/balsa
  - non-metallic honeycomb
- High strength-to-weight ratio
- Standard EIA sizes
- Choice of hard- or shock-mount



Size Range†

*EIA DESIGNATION	INSIDE RACK DIMENSIONS (in.)		
	H	W	D
3U to 42U	5.37 to 73.62	17.75 to 17.75	20.00 to 20.00

†Hard mount cases only—shock-isolated range slightly smaller.
*EIA: Electronic Industries Association
NOTE 1: Consult factory for additional sizes available.
NOTE 2: Most portable rack-mounted electronic equipment is required to be protected to a range of 25 to 40 G's. These requirements are met in either F.G. or sandwich construction with isolated racks and elastomeric mounts. For specific requirements beyond this range, please consult the factory for materials and processes.

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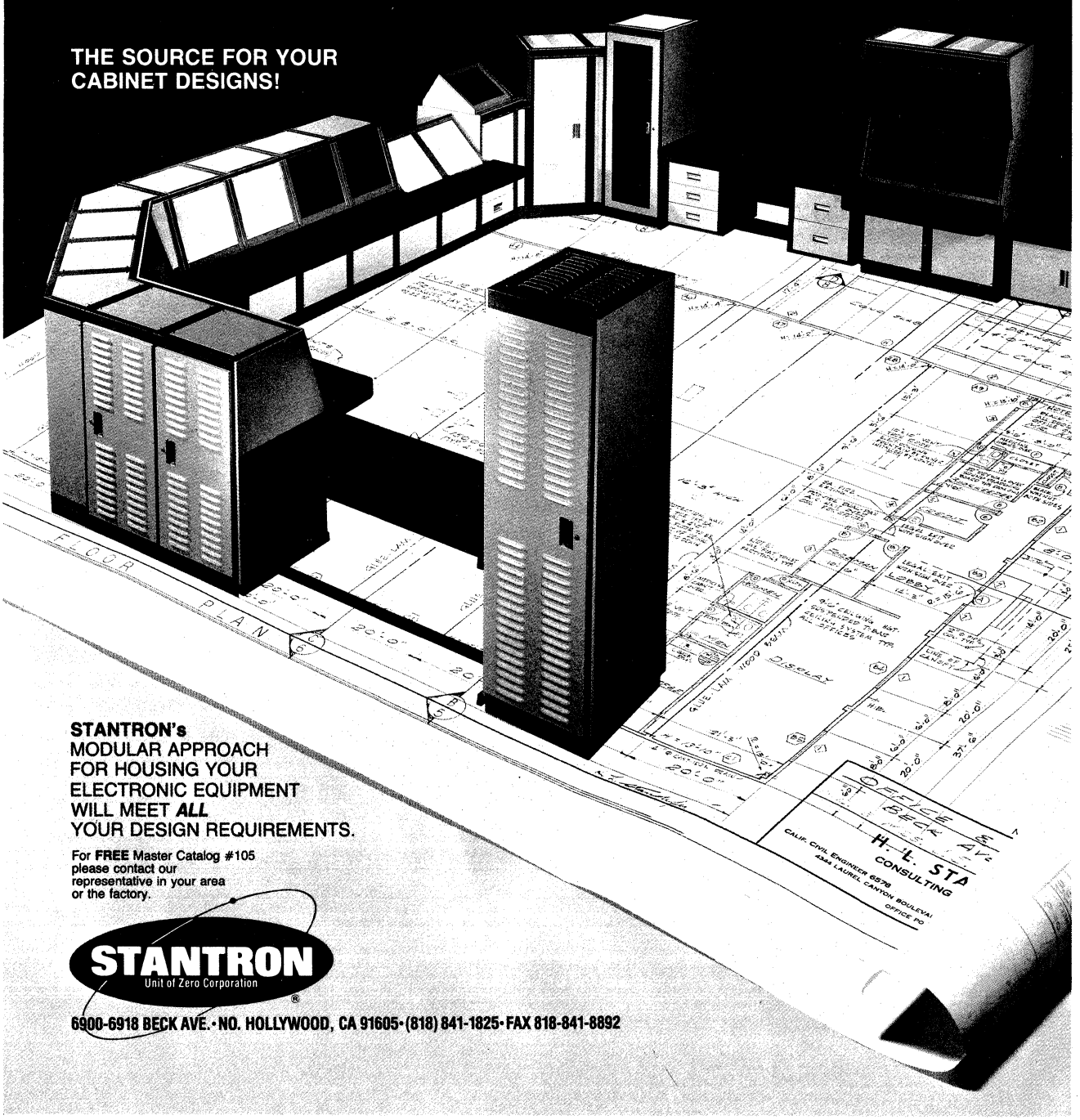

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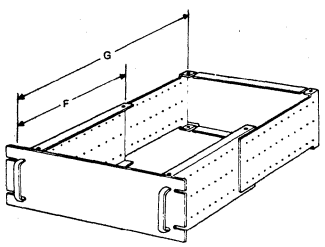
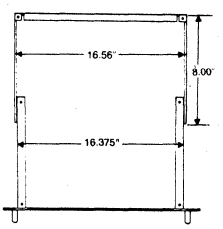
THE STRONGBOX™

E-SERIES EXTENSION KITS

E-Series depth Extension kits are user adjustable in ½" increments for intermediate and extended chassis depth. Thus any chassis depth from 9½" to 26" is available off-the-shelf.

E-Series kits contain 2 Extension Side Panels and 2 Extension Perforated Covers.





EXTENSION RANGE

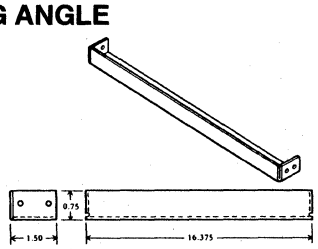
Kit Number	F	+E-Series = G
SB9-	9.50"	9.50" - 16.50"
SB12-	12.00"	12.00" - 19.00"
SB19-	19.00"	19.00" - 26.00"

E-SERIES DEPTH EXTENSION KITS

Extension Kit Number	Mates With			Price
E-3	SB9-3	SB12-3	SB19-3	125.00
E-5	SB9-5	SB12-5	SB19-5	128.00
E-7	SB9-7	SB12-7	SB19-7	131.50
E-8	SB9-8	SB12-8	SB19-8	132.50
E-10	(NONE)	SB12-10	SB19-10	169.50

Add dash "—SAC" to kit number to get Solid instead of Perforated covers (deduct $20.00 from kit price). Add dash "—SAC 1" to kit number to get one, each, Solid and Perforated cover (deduct $10.00 from kit price).

MA-1.5 MOUNTING ANGLE



The Mounting Angle is used to attach card guides and other interior parts when a full-length, -height, or -width platform is not required or would impede the flow of cooling air. It also adds torsional stiffness to chassis used in extremely demanding environments.

Each heavy-duty MA-1.5 is made of 0.090"-thick, clear-iridited aluminum, and is supplied with captive attachment hardware. It is an "L"-shaped solid which mounts to pre-drilled chassis holes in any of four useful orientations.

Order SB9-, SB12-, and SB19-Series parts from this table. Parts in each column mate with others of the same depth.

PARTS	KIT DEPTH	KIT DASH NUMBER						
		-1	-3	-5	-7	-8	-10	-12
Handle	ALL	(none)	SBH-3	SBH-5	SBH-7	SBH-8	SBH-10	SBH-12
Front Panel	ALL	FP-1	FP-3	FP-5	FP-7	FP-8	FP-10	FP-12
Interior Mounting Panel	ALL	IMP-1	IMP-3	IMP-5	IMP-7	IMP-8	IMP-10	IMP-12
Side Panel	SP9-	CHA9-1	SP9-3	SP9-5	SP9-7	SP9-8	(none)	(none)
	SP12-	CHA12-1	SP12-3	SP12-5	SP12-7	SP12-8	SP12-10	(none)
	SB19-	(none)	SP19-3	SP19-5	SP19-7	SP19-8	SP19-10	SP19-12
Perforated Cover	SB9-	PAC-9	PAC-9	PAC-9	PAC-9	PAC-9	(none)	(none)
	SB12-	PAC-12	PAC-12	PAC-12	PAC-12	PAC-12	PAC-12	(none)
	SB19-	(none)	PAC-19	PAC-19	PAC-19	PAC-19	PAC-19	PAC-19
Solid Cover	SB9-	SAC-9	SAC-9	SAC-9	SAC-9	SAC-9	(none)	(none)
	SB12-	SAC-12	SAC-12	SAC-12	SAC-12	SAC-12	SAC-12	(none)
	SB19-	(none)	SAC-19	SAC-19	SAC-19	SAC-19	SAC-19	SAC-19
Bottom Mounting Plate	SB9-	(none)	IMP-8	IMP-8	IMP-8	IMP-8	(none)	(none)
	SB12-	(none)	BMP-12	BMP-12	BMP-12	BMP-12	BMP-12	(none)
	SB19-	(none)	BMP-19	BMP-19	BMP-19	BMP-19	BMP-19	BMP-19
Heavy Cover Plate	SB9-	HCP-9	HCP-9	HCP-9	HCP-9	HCP-9	(none)	(none)
	SB12-	HCP-12	HCP-12	HCP-12	HCP-12	HCP-12	HCP-12	(none)
	SB19-	(none)	HCP-19	HCP-19	HCP-19	HCP-19	HCP-19	HCP-19
Mounting Angle	ALL	MA-1.5	MA-1.5	MA-1.5	MA-1.5	MA-1.5	MA-1.5	MA-1.5
Depth Extension Kit	ALL	(none)	E-3	E-5	E-7	E-8	E-10	(none)
Slide Kit	SB9	SLD-9	SLD-9	SLD-9	SLD-9	SLD-9	(none)	(none)
	SB12	SLD-12	SLD-12	SLD-12	SLD-12	SLD-12	SLD-12	(none)
	SB19	(none)	SLD-19	SLD-19	SLD-19	SLD-19	SLD-19	SLD-19

RACK-MOUNT CHASSIS KITS AND PRICE LIST

Kit Dash Number	Number of Rack Units	Front Panel Height	Price		
			SB9-	SB12-	SB19-
-1	1	1.72	90.00	95.00	(none)
-3	2	3.47	206.00	212.00	221.00
-5	3	5.22	212.50	218.50	227.50
-7	4	6.97	220.50	226.50	235.50
-8	5	8.72	227.50	232.50	242.00
-10	6	10.47	(none)	289.50	297.00
-12	7	12.22	(none)	(none)	306.00

Add dash "—SAC" to kit number to get Solid instead of Perforated covers (deduct $20.00 from kit price). Add dash "—SAC 1" to kit number to get one, each Solid and Perforated cover (deduct $10.00 from kit price).

Detailed drawings available on request. Other sizes available; call for quote.

Prices subject to change.
Order Bottom Mounting Plates, Slides and additional Interior Mounting Panels as separate items.

STRONGBOX™ P.O. Box 2726, Culver City, CA 90231
(213) 305-8288

THE STRONGBOX™

HEAVY-DUTY RACK-MOUNT CHASSIS

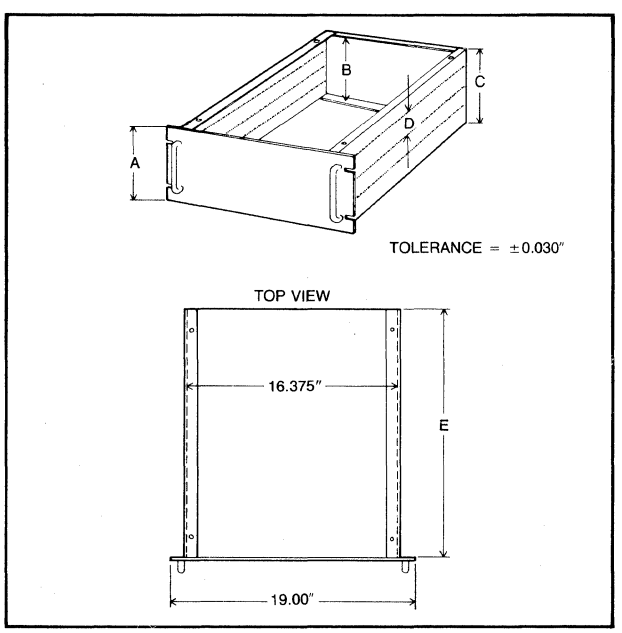
SB9-, SB12-, SB19-SERIES

Seven EIA Front Panel heights: 1¾″, 3½″, 5¼″, 7″, 8¾″, 10¼″, and 12½″ (1, 3, 5, 7, 8, 10, 12 nominal).

Three-standard depths: 9½″ (SB9-Series), 12″ (SB12-Series), and 19″ (SB19-Series).

Components can be ordered as complete kits or by the part. See kit and parts table. Kits and parts come with all required captive machine hardware. Front, Side, and Mounting Panels are clear iridited. Covers and handles are clear anodized. All surfaces are satin grained.

Each kit (except SB9-1 and SB12-1) contains 1 Front Panel, 2 Handles, 2 Side Panels, 2 Perforated Covers, and 1 Interior Mounting Panel.



SPECIFICATIONS

PARTS

FRONT PANEL — 0.125″ thick, 19.00″ wide. 6061-T6 aluminum. EIA notched.

SIDE PANEL — 0.090″ thick, 5052-H32 aluminum. Three rows of holes on ½″ centers for mounting panels, card cages, etc.

INTERIOR MOUNTING PANEL — 0.090″ thick, 16.37″ wide. 5052-H32 aluminum. For use as a rear panel or vertical or horizontal mounting panel.

PERFORATED ALUMINUM COVER — 0.063″ thick. 16.85″ wide. 3003 aluminum. Assembles with four screws and captive stainless steel nuts.

STRONGBOX™ HANDLE — Standard aluminum handle.

ACCESSORIES

BOTTOM MOUNTING PLATE — 0.090″ thick, 16.37″ wide. 5052-H32 aluminum. For mounting heavy components. Clear iridite finish.

SOLID BEARING SLIDE — .38″ thick. Cad plated steel. Adjustable brackets for assembling to EIA tapped-rail.

SOLID ALUMINUM COVER — 0.063″ thick, 16.85″ wide. 5052-H32 aluminum. Clear anodize finish.

HEAVY COVER PLATE — 0.090″ thick, 16.88″ wide. 5052-H32 aluminum. For mounting heavy components flush with chassis bottom. Clear iridite finish.

Detailed drawings available on request. Other sizes available; call for quote.

DIMENSIONS

Kit Number	A	B	C	D	E
SB9-1	1.72	1.22	1.40	0.50	9.50
SB9-3	3.47	2.91	3.15	0.75	9.50
SB9-5	5.22	4.66	4.90	1.50	9.50
SB9-7	6.97	6.41	6.65	2.00	9.50
SB9-8	8.72	8.16	8.40	3.00	9.50
SB12-1	1.72	1.22	1.40	0.50	12.00
SB12-3	3.47	2.91	3.15	0.75	12.00
SB12-5	5.22	4.66	4.90	1.50	12.00
SB12-7	6.97	6.41	6.65	2.00	12.00
SB12-8	8.72	8.16	8.40	3.00	12.00
SB12-10	10.47	9.91	10.15	3.50	12.00
SB19-3	3.47	2.91	3.15	0.75	19.00
SB19-5	5.22	4.66	4.90	1.50	19.00
SB19-7	6.97	6.41	6.65	2.00	19.00
SB19-8	8.72	8.16	8.40	3.00	19.00
SB19-10	10.47	9.91	10.15	3.50	19.00
SB19-12	12.22	11.66	11.90	4.00	19.00

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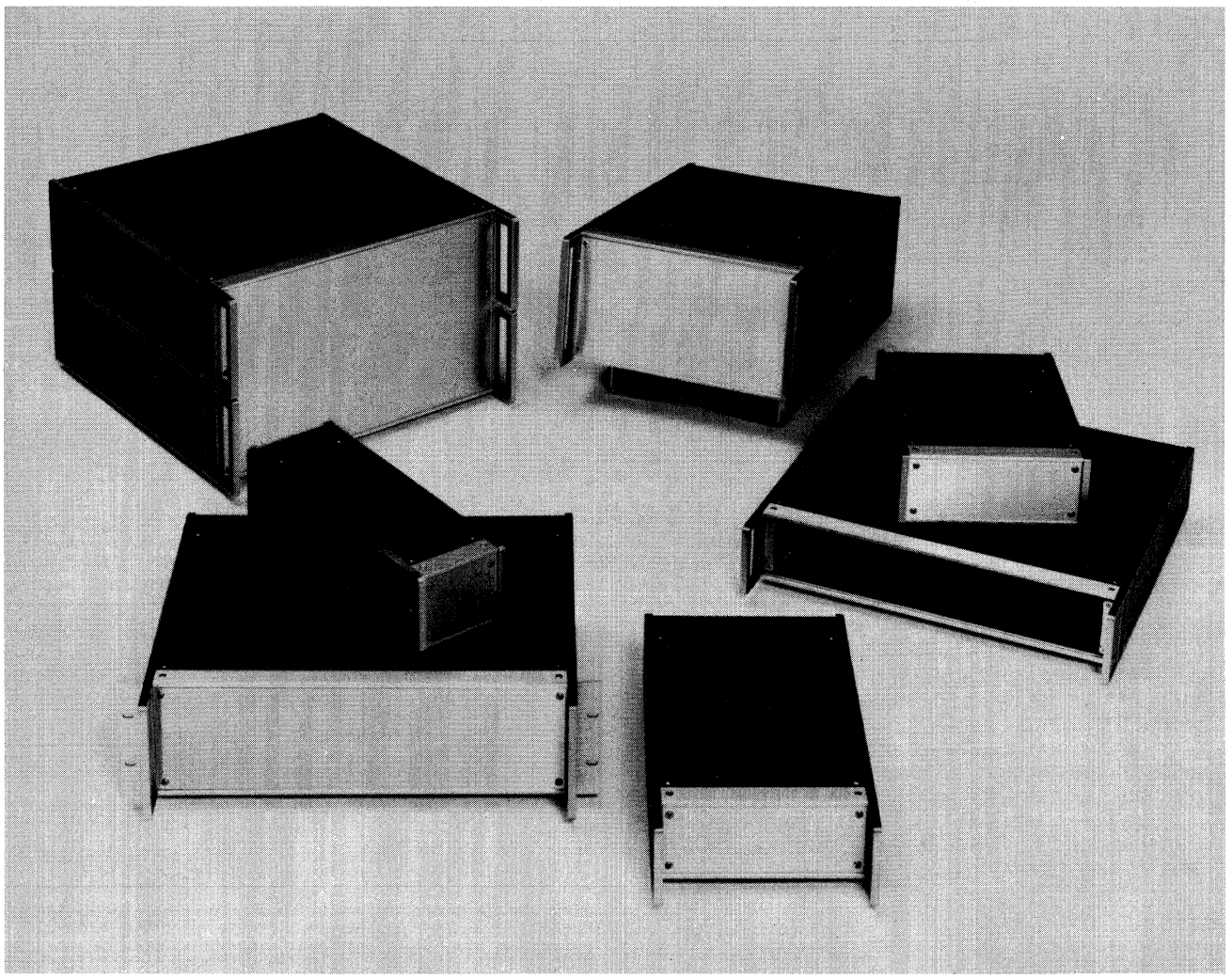
TDJ Company, Inc.
Instrument Enclosures



Available With or Without Handles

Easily Assembled

Sliding Top and Bottom Covers for Maximum Accessibility

Convenient Side Frame Mounting Hole Pattern

Will Accept Your Custom Removable Front and Rear Panels

Standard Colors—Black, Brown and Blue, Off White

Over 100 Standard Models Available

The BETA-LINE Series enclosures offer the ultimate in quality and versatility and provide an extensive range of standard packaging dimensions. Rugged die cast aluminum side frames are uniquely engineered to accommodate the latest modular construction. The top and bottom as well as the side covers are easily removed for quick internal access. The beautifully finished side frames and vinyl clad aluminum covers combine to produce a superbly crafted enclosure. Standard vinyl colors include blue, black and brown. A full complement of optional accessories include instrument bails, rack mounting kits, rack mounting slides and aluminum front or rear panels. Rack mounting complies with MIL-STD-189. A retractable instrument bail is available for bench mounting applications. The flexible design of these enclosures permits us to provide customized enclosures for your special requirements.

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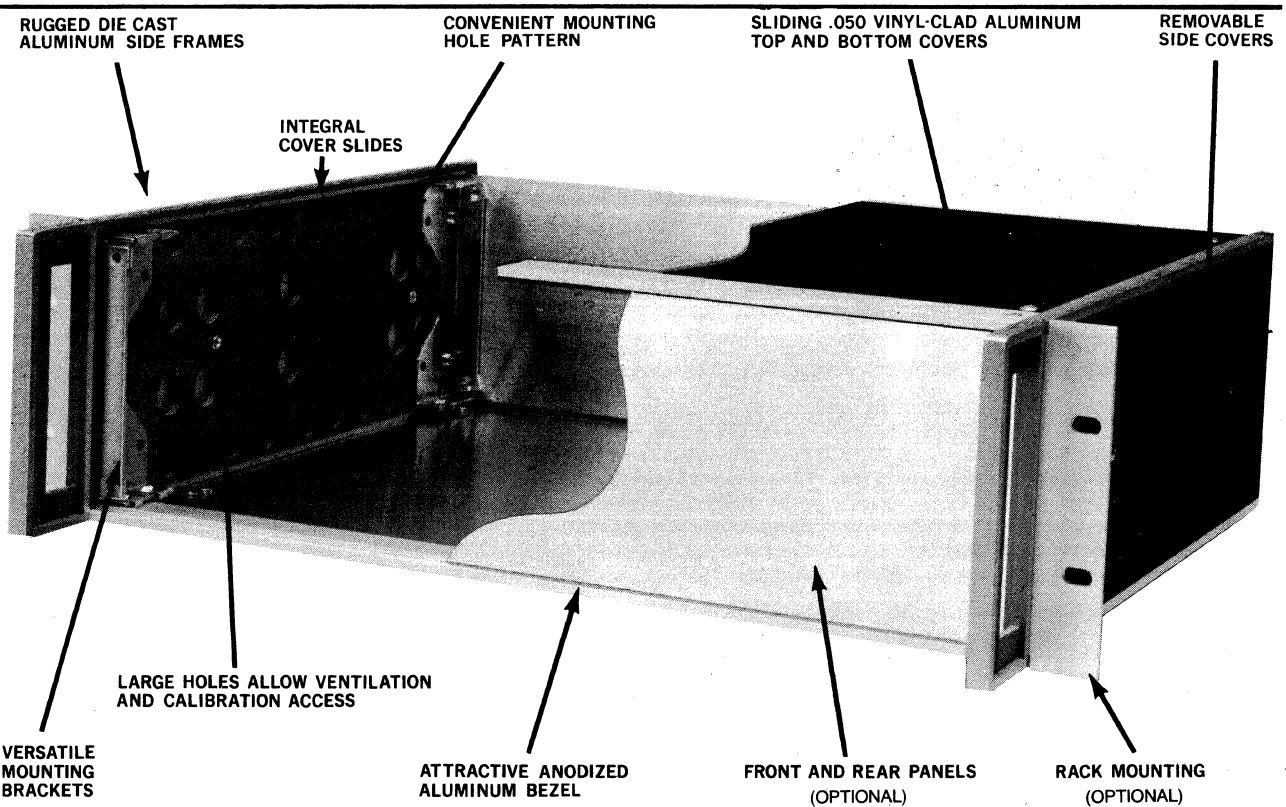
TDJ Company, Inc.

Instrument Enclosures



Model number is determined by outside dimensions of enclosure. Example for Model **B-350-13-1700** is:

B 350-13-1700 H

- 3.5 inches High
- 13.0 Inches Deep
- 17.0 Inches Wide
- Add "H" to Model No. to indicate "With Handle"

3.5 Inch Height	5.25 Inch Height	7 Inch Height	8.75 Inch Height
B-350-13-1700H	B-525-13-1700H	B-S700-13-1700H	B-S875-13-1700H
B-350-13-1275	B-525-13-1275	B-S700-13-1275	B-S875-13-1275
B-350-13-0850	B-525-13-0850	B-S700-13-0850	B-S875-13-0850
B-350-13-0425	B-525-13-0425	B-S700-13-0425	B-S875-15-1700H
B-350-15-1700H	B-525-15-1700H	B-S700-15-1700H	B-S875-15-1275
B-350-15-1275	B-525-15-1275	B-S700-15-1275	B-S875-15-0850
B-350-15-0850	B-525-15-0850	B-S700-15-0850	B-S875-17-1700H
B-350-15-0425	B-525-15-0425	B-700-17-1700H	B-S875-17-1275
B-350-17-1700H	B-525-17-1700H	B-700-17-1275	B-S875-17-0850
B-350-17-1275	B-525-17-1275	B-700-17-0850	
B-350-17-0850	B-525-17-0850		
	B-525-21-1700H		
	B-525-21-1275		
	B-525-21-0850		

10.5 Inch Height	12.25 Inch Height	14 Inch Height	15.75 Inch Height
B-S1050-13-1700H	B-S1225-13-1700H	B-S1400-13-1700H	B-S1575-17-1700
B-S1050-13-1275	B-S1225-13-1275	B-S1400-13-1275	B-S1575-17-1275
B-S1050-13-0850	B-S1225-13-0850	B-S1400-13-0850	B-S1575-17-0850
B-S1050-15-1700H	B-S1225-15-1700H	B-S1400-15-1700H	B-S1575-21-1700
B-S1050-15-1275	B-S1225-15-1275	B-S1400-15-1275	B-S1575-21-1275
B-S1050-15-0850	B-S1225-15-0850	B-S1400-15-0850	B-S1575-21-0850
B-S1050-17-1700H	B-S1225-17-1700H	B-S1400-17-1700H	
B-S1050-17-1275	B-S1225-17-1275	B-S1400-17-1275	
B-S1050-17-0850	B-S1225-17-0850	B-S1400-17-0850	
B-S1050-21-1700H			
B-S1050-21-1275			
B-S1050-21-0850			

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SYMBOLS USED BY INTERNATIONAL REGULATORY AGENCIES

These symbols appear on many electrical/electronic components distributed in the world market. They indicate that a country's standard-setting agency has approved the design of the component and/or a testing agency has approved the performance of the component in meeting the standard. This page lists only those countries that have a *symbol* to represent their authority.

Argentina (IRAM) Instituto Argentino de Racionalization de Materiales

Australia (SAA) Standards Association of Australia

Austria (ÖVE) Öesterreichischer Verband für Elektrotechnik

Belgium (CEB) Comité Electrotechnique Belge

Brazil (ABNT) Associação Brasileira de Normas Teonicas

Canada (CSA) Canadian Standards Association

Czechoslovakia Urad pro Normalizaci a Mereni (Office for Standards and Measurements)

Denmark (DEK) Dansk Elektroteknisk Komite (Danish Electrotechnical Committee)

Egypt (EOS) Egyptian Organization for Standardization and Quality Control

Finland (SETI) Electrical Inspectorate

France (UTE) Union Technique de l'Électricité

Germany, Democratic Republic of (East) (ASMW) Amt für Standardi-sierung Messwesen und Warenprufung (Office for Standardization, Metrology and Quality Control)

Germany, Federal Republic of (West) (DKE) Deutsche Electrotechnische Kommission im DIN und VDE (German Electrotechnical Commission of DIN and VDE)

Greece (ELOT) The Hellenic Organization of Standardization

Hong Kong Hong Kong Standards & Testing Centre

Hungary (MSZH) Magyar Szabvanyugi Hivatal (Hungarian Office for Standardization)

India (ISI) Indian Standards Institute "Manak Bhavan"

Indonesia Badan Kerjasama Standardisasi LIPI-YDNI (LIPI-YDNI Joint Standardization Committee)

Iran Institute of Standards and Industrial Research of Iran

Ireland (IIRS) Institute for Industrial Research and Standards

Israel (SII) Standards Institution of Israel

Italy (CEI) Comitato Elettrotecnico Italiano (Italian Electrotechnical Committee)

Japan (JISC) Japanese Industrial Standards Committee Agency of Industrial Science and Technology

Korea, Republic of (South) Industrial Advance Administration

Mexico (DGN) Dirección General de Normas Secretaria de Patrimonio y Fomento Industrial Puente de Tecamachalco

Netherlands (NEC) Nederlands Elektrotechnisch Comite

New Zealand (SANZ) Standards Association of New Zealand

Norway (NEK) Norsk Elektroteknisk Komite (Norwegian Electrotechnical Committee)

Pakistan Pakistan Standards Institution

Poland Polski Komitet Normalizacji Miar i Jakosci (Polish Committee for Standardization, Measures and Quality Control)

Portugal (CEP) Comissão Electrotécnica Portuguesa

Romania Institutul Roman de Standardizare (Romanian Standards Institute)

Singapore Singapore Institute of Standards and Industrial Research

South Africa (SABS) South African Bureau of Standards

Spain (IRANOR) Instituto Nacional de Racionalización y Normalización

Sweden (SEK) Svenska Elektriska Kommissionen (Swedish Electrotechnical Commission)

Switzerland (SEV) Schweizerischer Elektrotechnischer Verein Postfach

Turkey (TSE) Turk Standardlari Enstitusu (Turkish Standards Institution)

United Kingdom (BSI) British Standards Institution

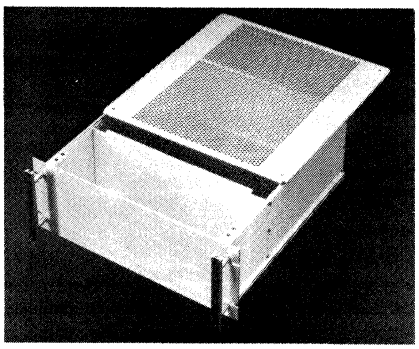
United States (ANSI) American National Standards Institute

United States (NEMA) National Electrical Manufacturers Association

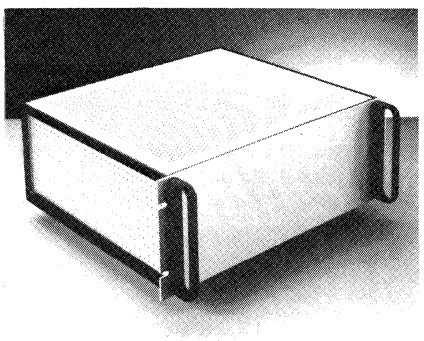
Venezuela CODELECTRA en Conjunto con COVENIN Avda. Ppal.

Yugoslavia Federal Institute of Standardization

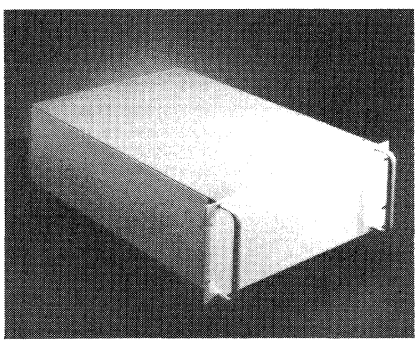
WELCOME....
To Our Growing Family



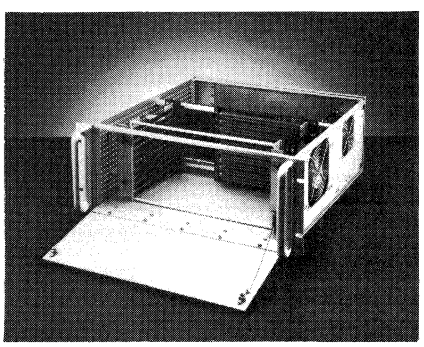
First the **SRK/CRK**, our oldest and still most popular line of rack-mounting enclosures; the SRK Seven-eighths spacing Rackmount Kit and CRK Chassis Rack Kit both exemplify our high standards in quality material and workmanship. Strong and flexible, ready to use in whatever configuration you design using the hundreds of height/depth combinations available from our immense inventory....then there is our



VCD/VSA Variable Chassis Drawer and Stand-Alone series of rack-mount, bench-top and convertible kits and parts; colorful, elegant in style, contemporary design, the sporty look for today's high-tech applications....and no packaging system would be complete without our newest product, the



BKCD BasiKit line of simple, economical chassis drawers designed for our customers who want quality; yet pricing that is less expensive than some of the other more elaborate designs; this "no-frills" unit is for those who want to get back down to basics. And for the ultimate in off-the-shelf convenience, we have just introduced our



PMIA Powered Multibus *I Assembly, pre-assembled and ready to receive your printed circuit cards. What a time and money saver for you!! They're adaptable to fit your particular applications, and available with dozens of mounting accessories in either rack-mount or bench-top [stand-alone] models. All of our products come with mating assembly hardware, instructions and Techmar's "no-fault" warranty. Phone us toll-free about these & our complete list of other exciting product lines, hardware and accessories. Get a free, full-color catalog sent to you. Prices, applications assistance, specs, dimensional & delivery info are as close as your phone. Want to know more? Turn to the next four pages and read on....

Then pick up the phone and call us at **1-800-TECHMAR [1-800-832-4627].**
*Multibus is a trademark of Intel Corporation.

TECHMAR

TECHMAR CORP. **2232 South Cotner Avenue** **Los Angeles, CA 90064**

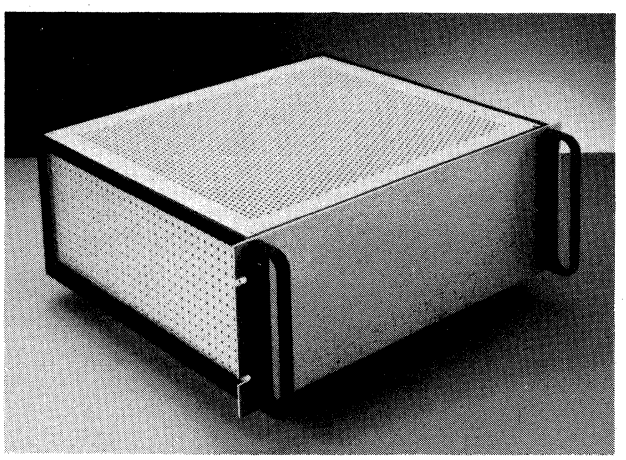
VCD series
Variable Chassis Drawer

Same-day/next-day shipping

V for VARIABLE: meaning VCDs can be assembled into even more thousands of configurations than any of Techmar's previous widely used enclosure lines.

CD for CHASSIS DRAWERS: meaning VCDs are for assembly in EIA racks and rack cabinets. Among many new design improvements:

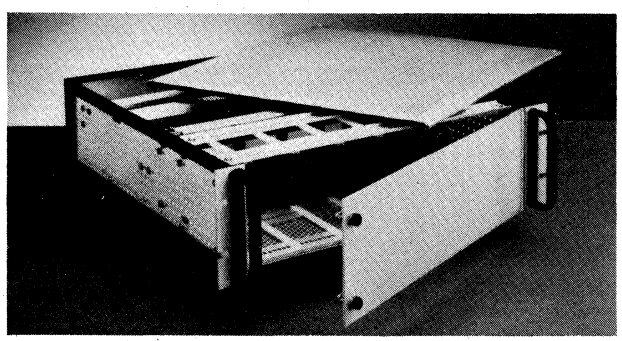
- Assembly-hole pattern is on 7/16" centers both vertically and horizontally, 1/4 of the EIA height increment.
  FOR YOUR CONVENIENCE: This 90-degree symmetry allows you to mount card cages for front, rear, top or bottom loading, without having to drill special holes, while retaining Techmar's long-time previous hole pattern's advantage of regularizing the locatability of internal parts relative to tops, bottoms & centers of your chassis drawers. And the new hole patterns give you the help of smaller pitches for locating internal parts.
- Your choice of nine color combinations.
- You can machine your mounting surfaces in the flat before you assemble edge-stiffeners.
- Convertibility between VCD rackmount and VSA stand-alone models for benchtop applications [see next page].
- Phone for free full-color catalog.

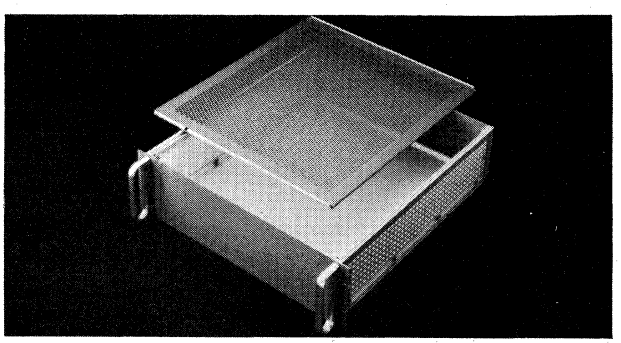


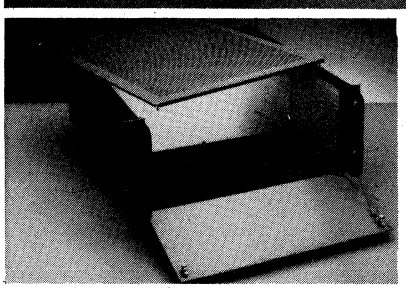
VCD Kits

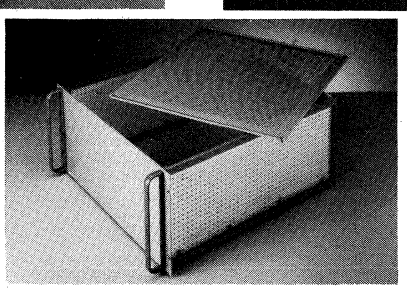
If you order a standard kit by height, depth and color but no other dash or dot numbers, you will receive the parts & hardware for an assembly which includes a 12-piece frame of extrusions, standard front panel, handles, structural side panels with assembly-hole pattern, top/bottom perforated covers, & outside back panel, all in whatever color combination you specify. By adding a dot SC, you also receive Side Covers to hide the assembly holes and screwheads on the side panels. Some of the thousands of other kit options ready for immediate shipment are shown below. So are a few of the much larger number of configurations that are available to you whether you choose to order as kits or as individual parts.

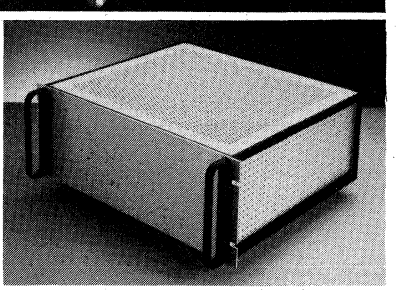
Sample VCD Assemblies including kit add-ons and ordering by the part











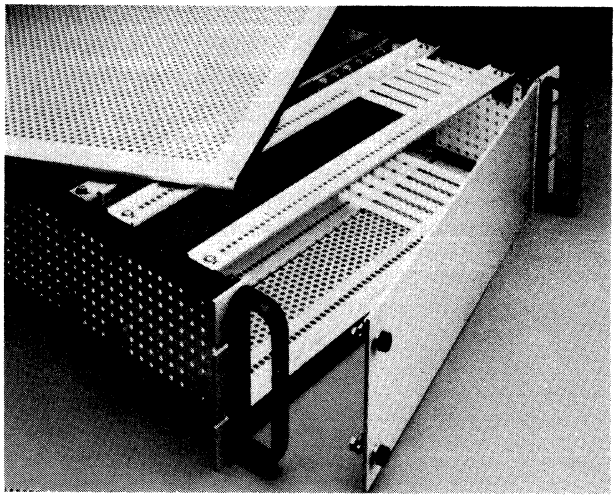
TECHMAR

For catalog & applications assistance: 1-800-TECHMAR **Innovators in enclosure technology**

Card Cages
to mate with VCD/VSA series

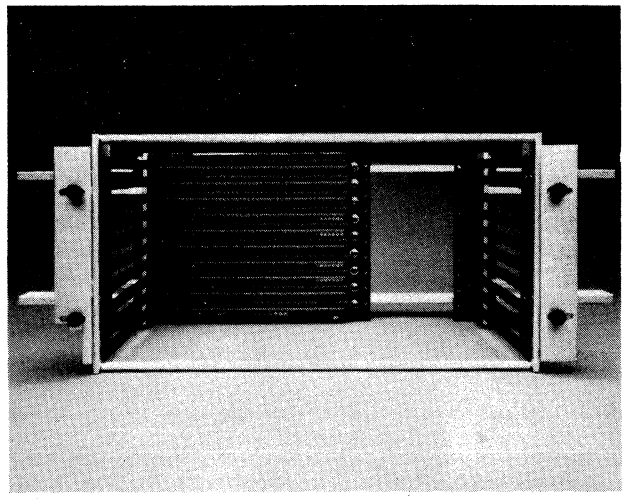
Same-day/next-day shipping

General-Purpose Card Cage series (GPCC)



A GPCC normally consists of backplane-mounting bars, guide-mounting bars, a backplane with connectors, a set of guides, and assembly hardware. It is stocked in eight versions for 6, 9, 12, 15, 18 or 21 connectors, or backplane with no connectors, or no backplane and no connectors, all in your choice of 5 guide lengths.

Multibus* I Card Cage series (MBICC)



Each MBICC includes two backplane mounting bars, two guide-mounting bars, a backplane with connectors, set of guides, & assembly hardware. See Techmar catalog & fliers for numbers of slots & other details of cages in stock.

Other bus cages

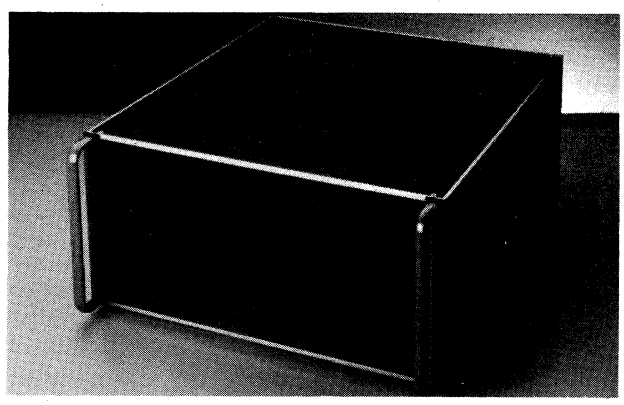
Phone Techmar's toll-free number for more information on other kinds of bus cage kits that may be available from stock by the time you read this. Plans for future expansion of our product lines include VCD-compatible versions of VME-bus, STD-bus, Multibus* II and others.

*Multibus is a trademark of Intel Corporation.

VSA series
Variable StandAlones

Same-day/next-day shipping

This is an exceptionally sturdy and decorative enclosure line for benchtop/desktop instrumentation. Its parts are the same as for a VCD kit of the same height, depth and colors, with the following exceptions: The front panel is normally 17 wide and recessed instead of 19 wide; handles are backed by spacers instead of panel ears; side covers & rubber feet are included; one-third perforated covers are standard unless otherwise specified. And as with the VCD line, you can choose from a large variety of options & accessories, including card cages & other internal mounting parts. Call the number below for free catalog and/or applications assistance.



TECHMAR

For catalog & applications assistance: 1-800-TECHMAR **Innovators in enclosure technology**

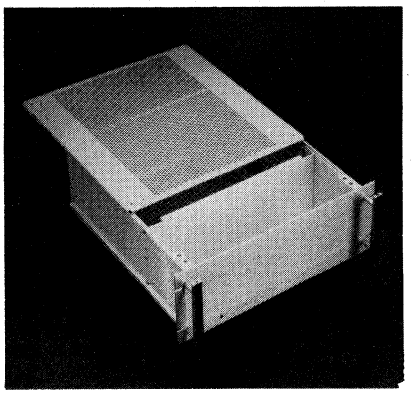
SRK/CRK series

Seven-eighths-spacing Rack-mounting Kits

Same-day/next-day shipping

Stocked for one-day shipping in your choice of 28 combinations of seven heights and four front-to-back depths, and with 7/8" vertical and 1/2" horizontal hole pattern, this SRK/CRK line of chassis drawers can be assembled in a vast variety of configurations without special hole drilling or punching. Double bends in side frame flanges & heavy-duty alumalloy materials make them extra sturdy. Order today, and they're on their way to you tomorrow! Phone toll-free number below and request your free full-color SRK/CRK catalog.

SRK Kits and Parts

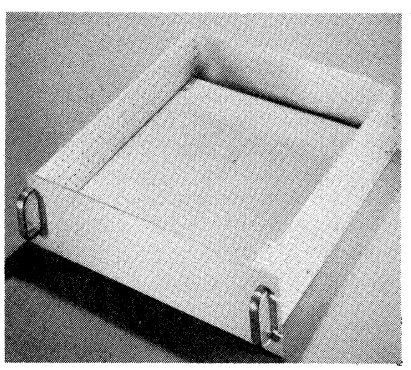


A basic SRK kit is ordered by adding dash numbers for any of seven heights and four depths. The kit will consist of one FP series Front Panel; two VPH Variable-Profile Handles, clear anodized with black vinyl decorative trim; two SF-SE series Side Frames with Seven-eighths-inch (vert-spacing) hole pattern; two HMP series Heavy-duty Mounting Panels (one for use as a rear panel, the other as an internal mounting panel); two PANC series Perforated Aluminum Non-sliding Covers (top/bottom); and all assembly hardware. Side-hinged or bottom-hinged front panels, card cages (see below), oval-section or T-section handles, full-bottom plates & thousands of other variations of parts and accessories can be ordered by adding dash numbers; or for even wider varieties & more combinations, order by individual part numbers from our incredible inventory.

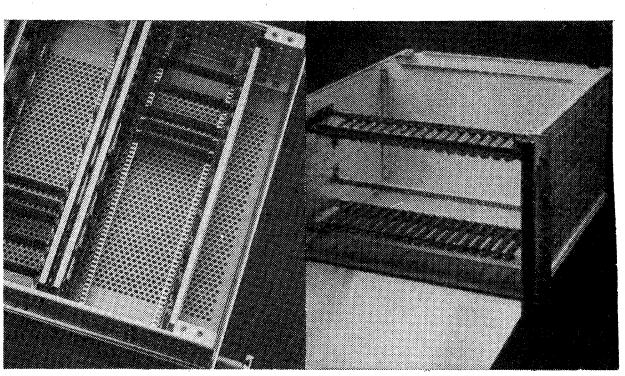
CRK Kits and Parts

A basic CRK kit consists of one FP series Front Panel, which like the SRK line is notched for assembling to tapped rails of rack; two OSH series Oval Section Handles, clear anodized; two SF-SE series Side Frames with Seven-Eighths vert-spaced hole pattern; one HMP series Heavy-Duty Mounting Panel (for use as rear panel); one FBP series Full-Bottom Plate for use as a chassis base, captive nuts pre-installed. All parts except handles are clear-chem-filmed (clear Iridited). All assembly hardware included.

As with the SRK line, thousands of options can be ordered by the use of dash numbers. For example, use kit number CRK-8H-15D to obtain the kit for the assembly shown at right:



QCC Card Cage Kits and Parts



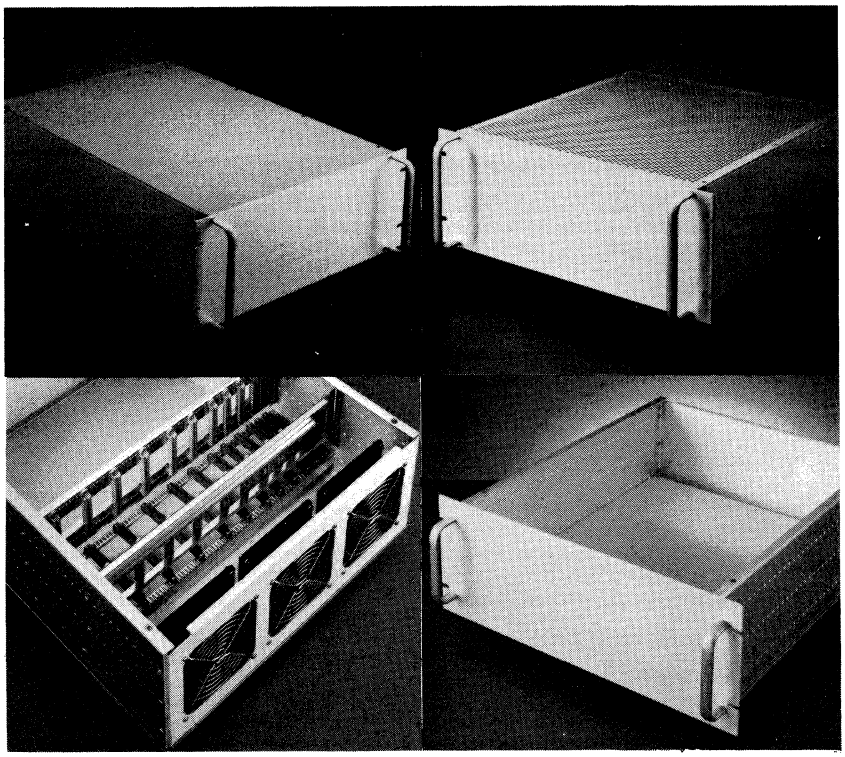
One of the most popular series of auxiliary parts of the SRK/CRK line are these QCC Quarter-inch Card Cage kits & parts with .25-inch pitch. They include connector rails which will accommodate almost any card connectors & backplanes, guide frames and snap-in card guides in your choice of three guide lengths: 3.15", 4.65" and 6.15". They assemble for front, back, top or bottom loading. Because the assembly method permits much variability, a large selection of card lengths and widths can be accommodated. The ACC series card cages with .20-inch pitch are also still available from stock.

TECHMAR

For catalog & applications assistance: 1-800-TECHMAR **Innovators in enclosure technology**

BKCD series
BasiKit Chassis Drawer
Same-day/next-day shipping

Here's Techmar's new economy line of chassis drawers. Not "economy" at the expense of quality and strength. It's strong and simple, & stocked in 3, 4, 5 and 6 EIA height units & in three front-to-back depths, nominally 12", 18" & 24". All parts clear-chemfilmed (clear Iridited) so you can have them refinished in any way you want after machining for your circuitry. The internal width is 16.70, the same as in the VCD/VSA line, so the internal parts are interchangeable (see pages 1 & 2 of this ad). And when your budget committee sees what you got for such a moderate price, you'll be a super-hero!



PMIA series
Powered Multibus*-I Assemblies
Same-day/next-day shipping

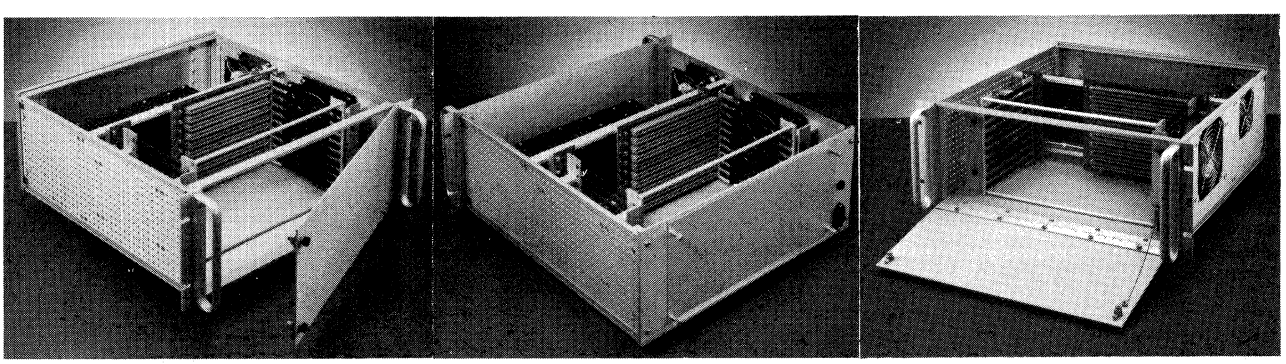
Here's how you and your customers can benefit from using Techmar's new Powered Multibus*I Assemblies (PMIA's):

*Multibus is a trademark of Intel Corporation

THEY SAVE YOU TIME:

- In stock for same-day or next-day shipping.
- Fully assembled and tested, ready for PC cards.
- No flanges to interfere with machining front/back panels.

THEY'RE HIGHLY ADAPTABLE:
You can choose from many options and accessories available as part of Techmar's VCD/VSA enclosure lines; they are also compatible with our new BKCD chassis drawers.
Phone for our PMIA flier & more detailed information.



TECHMAR

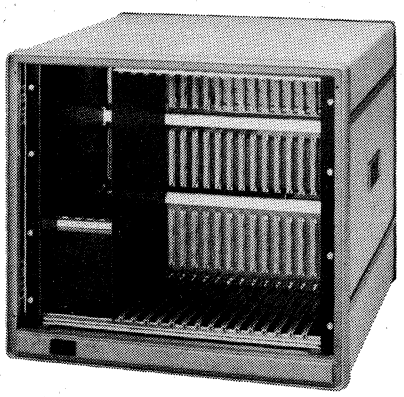
For catalog & applications assistance: 1-800-TECHMAR **Innovators in enclosure technology**

Turn Key Bus Packaging Systems

- *VME, VXI, Multibus II.*
- *High performance backplanes.*
- *Fully approved 400 watt, 4 output power supply.*
- *Completely wired and tested.*
- *Forced air cooling with 12VDC fans.*
- *User selectable 115/230VAC input.*
- *Card cage recessable.*
- *Punched I/O panels.*
- *All systems may be modified to your specification.*

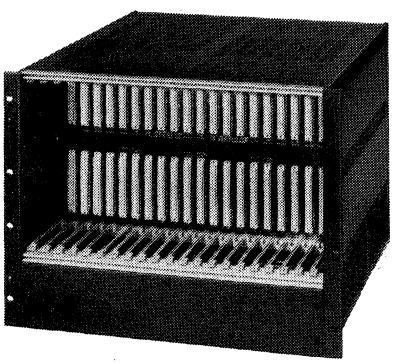
VME/VXI Industrial Stand-alone Systems

- All aluminum construction.
- 20 slots 6U, 9U or combination.
- Recessable sub-rack.
- Fully gasketed front panel.
- Separate power supply housing.
- Option card cage mounts in front, back or both.



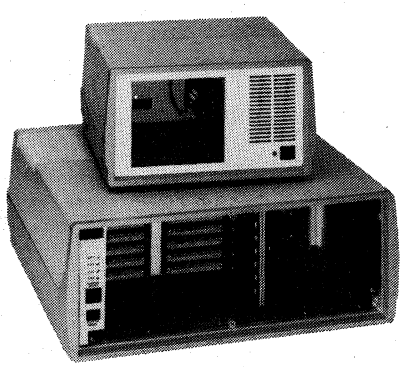
VME/VXI Rugged Rack-Mountable Systems

- Precision machined .250" side plates conceals hardware or .125" NC punched side plates.
- Front or rear EIA mounting brackets.
- Flexible height and depth.



VME Desk Top Enclosures & Storage Module

- Injection molded glass reinforced polycarbonate 94VO rated.
- EMI shielded/copper-nickel electroless plated.
- Compact design, excellent cooling, shielding and styling.

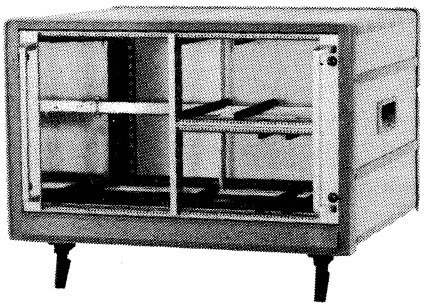


TRACEWELL enclosures inc.

567 Enterprise Drive
Columbus, Ohio 43081
Ohio: (614) 846-6175 FAX (614) 846-4450

1-800-848-4525

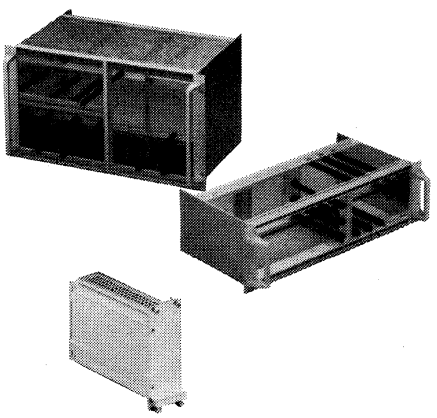
Euro Card/DIN Specification Enclosures



The E Series enclosures are designed to accept standard 19" panels or sub-racks. They are available in two heights, 5.25 inches (3U)) and 10.5 inches (6U), three depths are available. A built-in fan tray with easy access filter is optional. The aluminum construction provides a light weight enclosure, ideal for EuroCard systems.

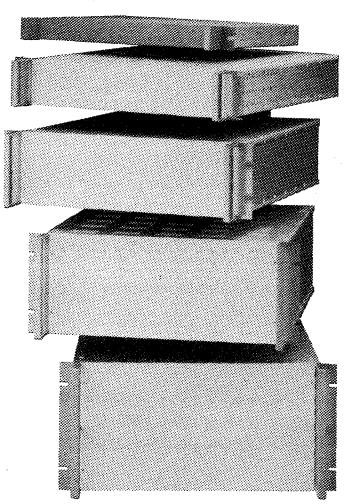
The ET series sub-racks and accessories conform to international standard dimensions (DIN, IEC, IEEE, etc.). The three models are designated ET3U to accommodate single height EURO cards and modules, ET6U to accommodate double height VME/Multibuss II cards and modules and ET4.5 to accommodate STD buss circuit cards.

Sub-Rack, Module and Accessories



The ET series sub-racks and accessories are designed for easy assembly, attractive appearance and rugged use. These 19" sub-rack systems are an ideal companion to the E3 and E6 series enclosures.

Rack Mounted EIA Enclosures



The CH series is a heavy-duty 19 inch rack-mounted chassis enclosure designed to comply with EIA standard RS310-C. Units are available in five heights: 1.75 inches, 3.5 inches, 5.25 inches, 7 inches and 8.75 inches, and two standard depths: 12 inches and 19 inches. Precision die cast aluminum handles act as structural members and also as EIA mounting brackets.

Custom Design Or Modifications

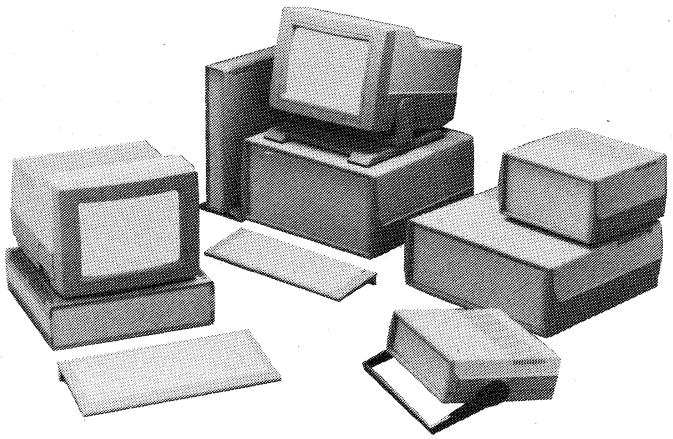
Tracewell Enclosures, Inc. Columbus, Ohio was founded in 1973. It designs and manufactures enclosures and systems. The company operates in a new 52,000 square foot facility which was designed to meet its special manufacturing requirements. Cad/Cam systems, N.C. punching and bending, CNC machining, chromating, painting, wiring and assembly, coupled with knowledgeable application engineers, can provide many answers to your packaging requirements.

TRACEWELL
enclosures inc.

567 Enterprise Drive
Columbus, Ohio 43081
Ohio: (614) 846-6175 FAX (614) 846-4450

1-800-848-4525

Injection Molded Electronic Enclosures

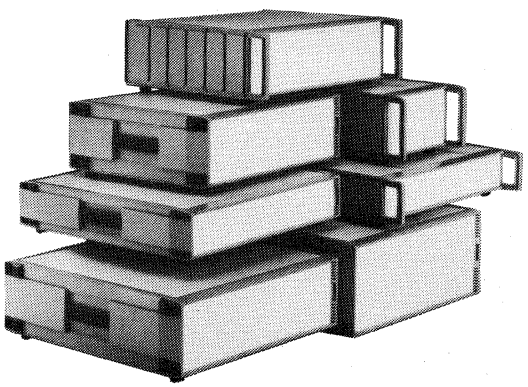


The NC series is a complete line of electronic enclosures designed for large systems, small peripherals, adjustable CRTs, low-profile keyboards, and CPU-type housings.

The product line is manufactured of injection-molded, glass reinforced polycarbonate.

The NC line features overlapping joints and vent openings with the proper slot geometry essential when shielding is required. The exterior finish on the NC series is a two coat textured polyurethane. The standard color is two-tone gray.

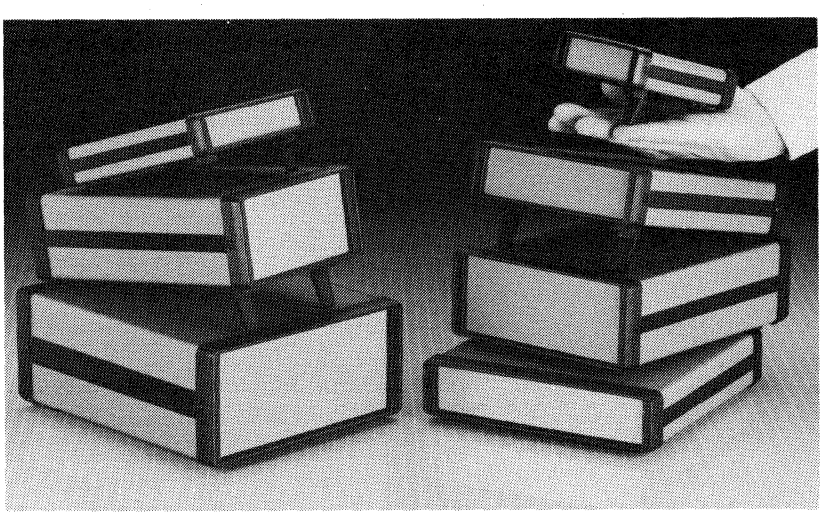
Die Cast Aluminum Electronic Enclosures



The R and SR enclosures use precision aluminum die castings for ruggedness as well as function and appearance. Unique construction techniques conceal the fasteners, yet provide easy access to the interior.

The R and SR series of enclosures can be used as stand-alone or as rack-mounted units. They are available in full EIA 19 inch rack and half-rack sizes.

Small Aluminum Enclosures



The SL series is available in seven models, from 3.5″W x .97″H x 3.7″D to 7.46″W x 3″H x 8″D. This series is constructed using extruded aluminum sides with PC grooves, aluminum front and rear panels, vinyl clad aluminum top and bottom covers. The bezels are injection molded polycarbonate. Pull down feet are standard. Options include: Chassis plate, mounting bracket and belt clip.

TRACEWELL enclosures inc.

567 Enterprise Drive
Columbus, Ohio 43081
Ohio: (614) 846-6175 FAX (614) 846-4450

1-800-848-4525

MINIGLOSSARIES
FORMULAS • CHARTS
PRODUCT SELECTION GUIDES
FORMS
CODES
TECHNICAL INFORMATION

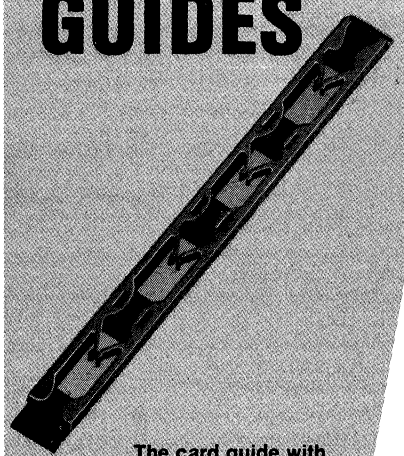
WHERE TO FIND THEM IN THE 88/89 EDITION OF EEM

Abbreviations/Acronyms ..... **A**•1404, **B**•1090, **C**•1119 **D**•1156
AC Power Supplies, Product Selection Guide ..... **D**•2156
ASCII Code ..... **D**•1080
Batteries, Product Selection Guide .... **D**•1447
Batteries & Fuel Cells, Characteristics ..... **D**•1450
Cabinets, Enclosures, Racks & Chassis, Product Selection Guide ..... **C**•1003
Capacitors, Basic Formulas ..... **A**•1093
Capacitors, Miniglossary ..... **A**•1066
Capacitors, Product Selection Guide . **A**•1002
Coils, Chokes, Inductors, Product Selection Guide ..... **A**•1197
Conductors, Maximum Current Capacity of Copper & Aluminum ... **A**•2272, **C**•1316
Connectors, Miniglossary ..... **C**•1271
Connectors, Terminals & Sockets, Product Selection Guide ..... **C**•1127
Crystals, Oscillators, Crystal & Piezoelectric Filters, Product Selection Guide ..... **A**•1339
DC Power Supplies, Product Selection Guide ..... **D**•1537
Delay Lines, Product Selection Guide ..... **A**•1503
Dielectrics, Thermal Conductivity .... **B**•1916
Discrete Semiconductors, Product Selection Guide ..... **A**•2154
Displays, Readouts, & CRTs, Product Selection Guide ..... **B**•1041
EBCDIC Code ..... **D**•1086
Encapsulation, Miniglossary ..... **C**•1124
Fans, Blowers, Cooling Equipment, & Heat Exchangers, Product Selection Guide ..... **C**•1631
Fiber Optics, Miniglossary ..... **B**•1185
Fiber Optics, Product Selection Guide ..... B•1204
Filters, Power, Product Selection Guide ..... **A**•1642
Filters, Signal, Product Selection Guide ..... **A**•1683
IC Master ..... **A**•1740
Instruments, Test & Measuring, Product Selection Guide ..... **D**•1210
Interconnection Systems, Product Selection Guide ..... **C**•1702
Keyboards & Keypads, Product Selection Guide ..... **B**•1854
Lamps, Lights, & Indicators, Product Selection Guide ..... **B**•1126
Logofinder & Trademark Directories ... **C**•901
Microwave Components, Product Selection Guide ..... **A**•1776
Military Qualified Products List ..... **B**•1002
Motors, Drives, & Rotating Components, Product Selection Guide ..... **B**•1221
Opto Semiconductors, Miniglossary ..... **A**•2169
Oscilloscopes, Product Selection Guide ..... **D**•1426
Panel Hardware, Product Selection Guide ..... **C**•1583
Panel Meters, Analog & Digital, Product Selection Guide ..... **D**•1376
Potentiometers, Trimmers, Controls, & Rheostats, Product Selection Guide ..... **A**•2078
Power Supplies, Miniglossary ..... A•2276, **D**•1541
Power Supplies, AC, Product Selection Guide ..... **D**•2156
Power Supplies, DC, Product Selection Guide ..... **D**•1537
Protective Components (Fuses, Circuit Breakers, etc.), Product Selection Guide ..... **B**•1351
Relay Contact Forms ..... **B**•1450
Relays, Electromechanical, Miniglossary ..... **B**•1414
Relays, Product Selection Guide ..... **B**•1411
Resistor Color Codes ..... **A**•1952
Resistors, Product Selection Guide ... **A**•1867
Servo Components, Miniglossary ..... **B**•1266
SI Units, Basic Guide To, ... **A**•1434, **B**•1472, **C**•1692, **D**•1386
Solenoids, Product Selection Guide ... **B**•1655
Switches, Product Selection Guide .... **B**•1673
Symbols—International Authorities ..... **A**•1454, **B**•1064, **C**•1104, **D**•1166
Thermal Components, Product Selection Guide ..... **B**•1886
Thermal Conductivity of Dielectrics at Room Temperature ..... **B**•1916
Thyristors/High Power Diodes, Miniglossary ..... **A**•2211
Timers, Miniglossary ..... **B**•1492, **D**•1140
Trademark & Logofinder Directories ... **C**•901
Transducers & Encoders, Product Selection Guide ..... **B**•1928
Transformers, Product Selection Guide ..... **A**•2215
Voltage Drop Nomograph ..... **A**•2262, **C**•1469, **C**•1960 **D**•1718
Wire & Cable, Product Selection Guide ..... **C**•1755
Wire Gauges—Diameter, Area, Copper Weight ..... **C**•1343, **C**•1759

UNITRACK INDUSTRIES INC.
1372 Enterprise Drive, P.O. Box 1927
West Chester, PA 19380
(215) 692-0800 • FAX 215-692-0801

UNITRACK®

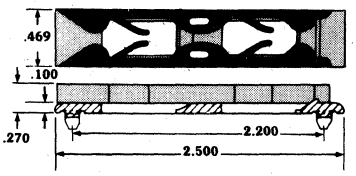
Vibration and Shock Damping CARD GUIDES



The card guide with spring fingers that hold your p.c. cards firmly and protect against shock and vibration. Molded of dimensionally stable polycarbonate . . . designed to let cooling air flow right through card guide even with dense rack packaging . . . counterbored holes or snap-in buttons for easy mounting. Available in sizes shown.

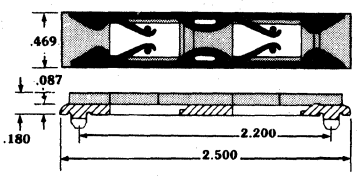
Electrostatic Discharge Guides
This entire line of card guides is also available in conductive (electrostatic discharge) plastic.

The products shown on the Unitrack pages herein are covered by patents and/or pending patent applications of UNITRACK INDUSTRIES INC.

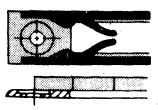


Style 2500-38-4
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)
*Recommended metal thickness .060" to .070"

Style 2500-38CB
Style 2500-384CB
has .128"Dia. holes counter bore .290" Dia. .040"

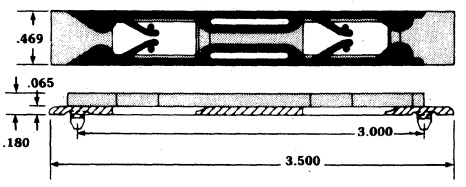


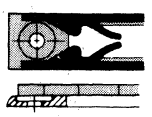
Style 2500-38
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)
*Recommended metal thickness .060" to .070"



Style SPC 3000 CB
(with holes for rivets or bolts) Guide has .125" holes counter bore .290" Diameter .038" deep.

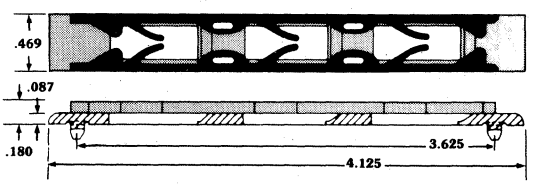
Style 3000
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)
*Recommended metal thickness .060" to .070"

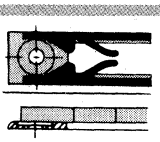




Style 58-30-40CB
(with holes for rivets or bolts) Guide has .128" holes .290" Diameter C.B. .038" deep.

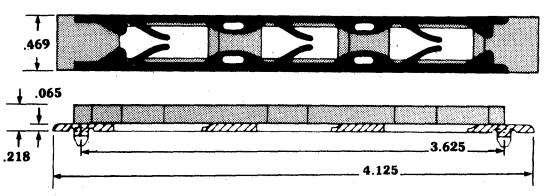
Style 58-30-40
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)
*Recommended metal thickness .060" to .070"



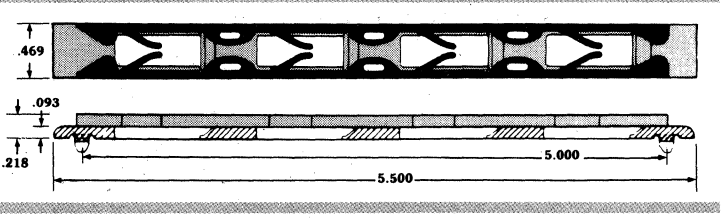


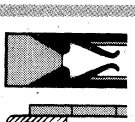
Style RAD4125CB
(with holes for rivets or bolts) Guide has .128" holes .290" Diameter C.B. .038" deep.

Style RAD4125
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)
*Recommended metal thickness .060" to .070"

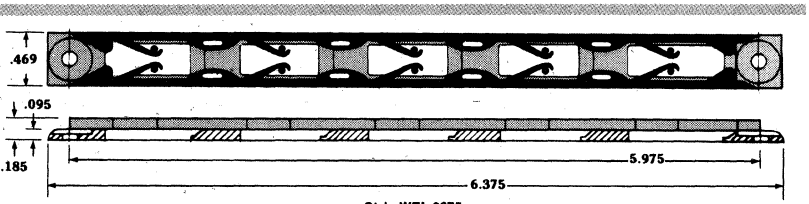


Style RAD5500
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)
*Recommended metal thickness .060" to .070"



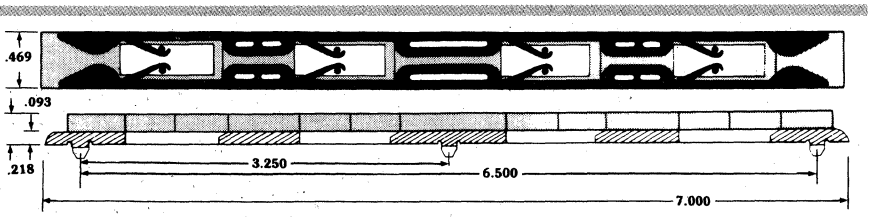


Style RAD6375
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 -.000)



*Recommended metal thickness .060" to .070"

Style WEL 6375
(with holes for rivets or bolts)
Guide has .128" holes .370 Dia. C.B. .040" deep.

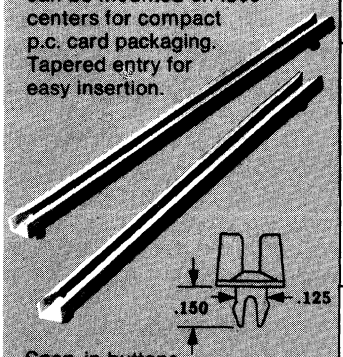


Style RAD7000
(with integral buttons*)
Mounting Hole Diameter 0.130" (+.003 - 000)
*Recommended metal thickness .060" to .070"

Series 300 and Series 400 Slotted Card Guides

Series 300

Precision molded of dimensionally stable polycarbonate. Series 300 slotted card guides can be mounted on .300" centers for compact p.c. card packaging. Tapered entry for easy insertion.



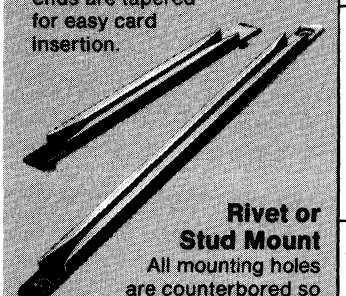
Snap-in buttons are molded in and provide quick, easy assembly to chassis or card racks. Buttons mount in .130 (+.003 -.000) hole in .060-.070 thick material.

Catalog Number *	Dimensions (inches)		
	A	B	C
S-300-3.5	3.5	3.0	-
S-300-5	5.0	4.5	-
S-300-6	6.0	5.5	-
S-300-8	8.0	7.5	3.75
PRD-3500	3.5	3.0	-
S-583040	4.125	3.625	-
PRD-6880	6.875	6.375	-
PRD-6875	6.875	6.375	-
PRD-8500	8.5	8.0	4.0
GV-7000†	7.5	7.0	3.5
GV-2000†	2.5	2.0	-

* *for 1/16 card thickness*
† *Molded of Nylon; standard.*

Series 400

Precision molded of dimensionally stable polycarbonate. Series 400 slotted card guides mount on .400". Entry ends are tapered for easy card insertion.



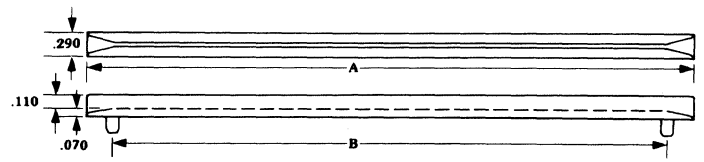
Rivet or Stud Mount

All mounting holes are counterbored so that a smooth, flat floor is provided for the card to slide on, whether eyelets, rivets or studs are used for mounting.

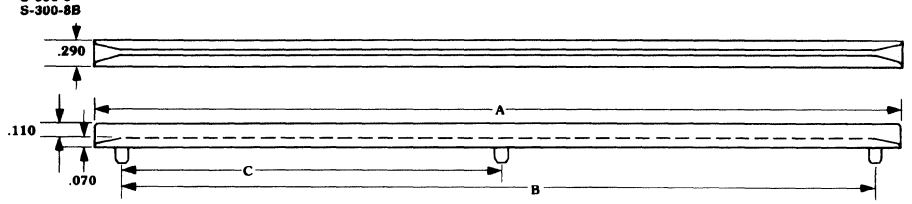
RV-4700 Snap-in rivet designed for mounting to .060" thick material.

Electrostatic Discharge Guides
This entire line of card guides is also available in conductive (electrostatic discharge) plastic.

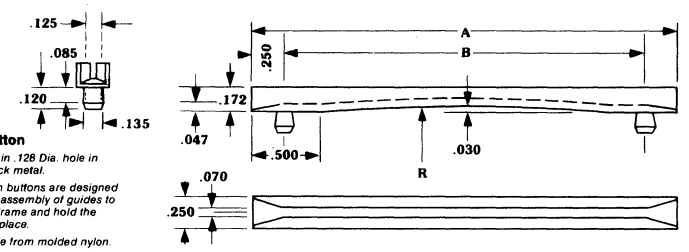
S-300-3.5
S-300-5
S-300-5B
S-300-6
S-300-6B
S-300-6C



S-300-8
S-300-8B



GV-2000
Molded Nylon



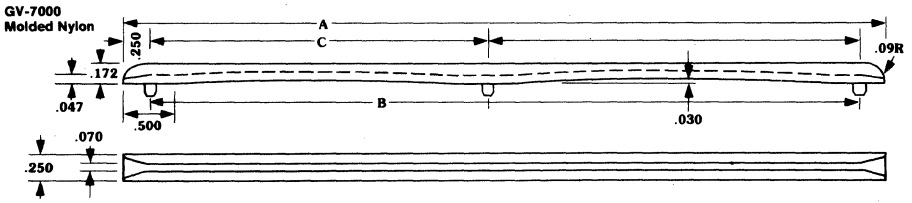
Snap-in Button

Button mounts in .128 Dia. hole in .060 to .070 thick metal.

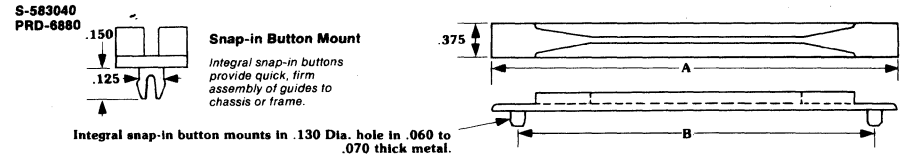
Integral snap-in buttons are designed for quick, easy assembly of guides to the chassis or frame and hold the guide firmly in place.

Series GV made from molded nylon.

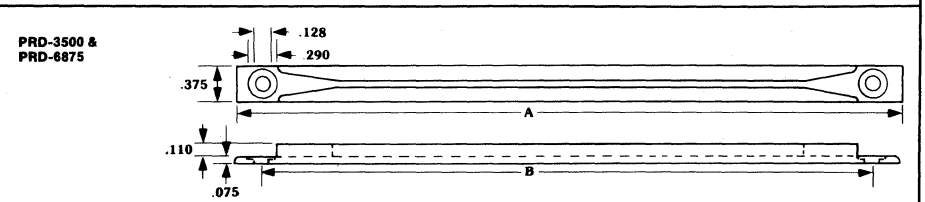
GV-7000
Molded Nylon



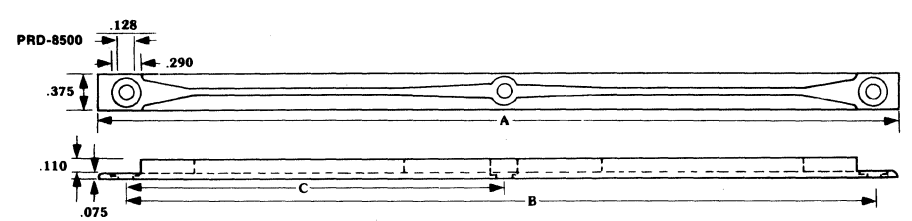
S-583040
PRD-6880



PRD-3500 &
PRD-6875



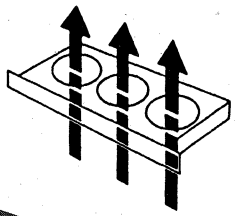
PRD-8500

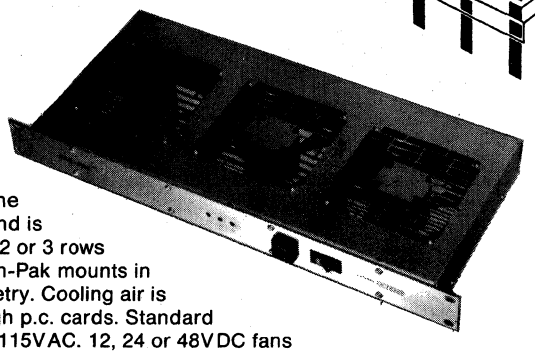


UNITRACK INDUSTRIES INC.
1372 Enterprise Drive, P.O. Box 1927
West Chester, PA 19380
(215) 692-0800 • FAX 215-692-0801

UNITRACK®

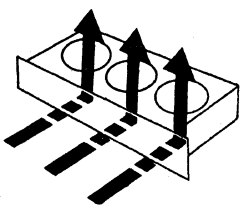
Fan-Pak® Cooling Packages

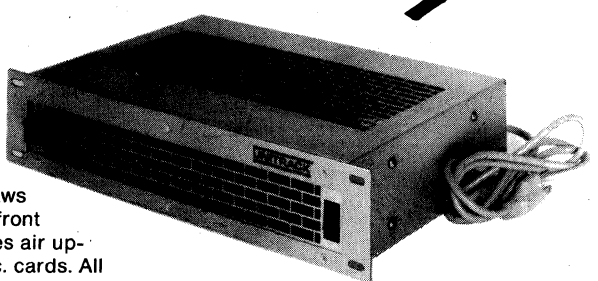




Series F

The Series F Fan-Pak takes one "U" unit (1¾") and is available with 1, 2 or 3 rows of three fans. Fan-Pak mounts in 19" or 24" cabinetry. Cooling air is forced up through p.c. cards. Standard 100cfm fans for 115VAC. 12, 24 or 48VDC fans also available. Fuse, 6' line cord or terminal block standard. See column at right for options available.



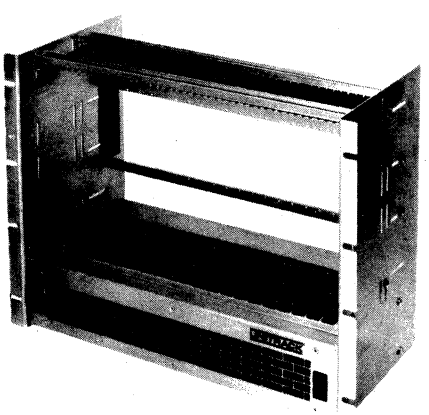


Series RA

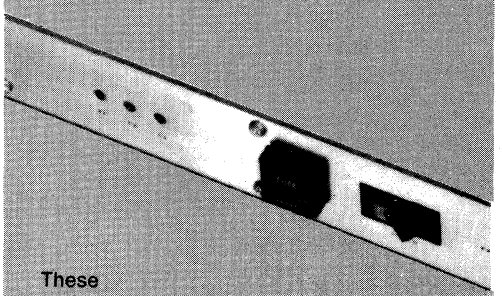
Series RA Fan-Pak is two "U" high and draws outside air from front panel and pushes air upwards across p.c. cards. All fan types and options available.

Series RAC

This Series combines the RA Fan-Pak and standard (or special) card cages. Available as a ready-to-mount component for mounting in 19" cabinetry.



Options for Cooling Packages

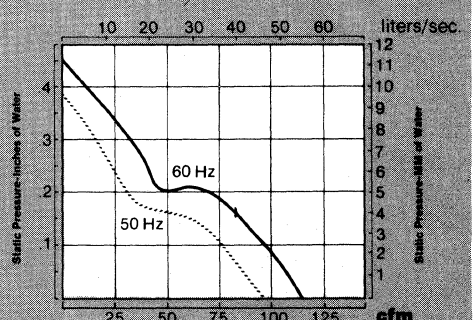


These options are available on all Fan-Paks.

- Pilot light to indicate fan in ON.
- Power switch to control power from front panel.
- Fan Alarm® circuit. LED indicators show fans operating. Switch contacts available for remote alarm.
- Terminal Block: in place of 6' line cord.
- Filter

Fans

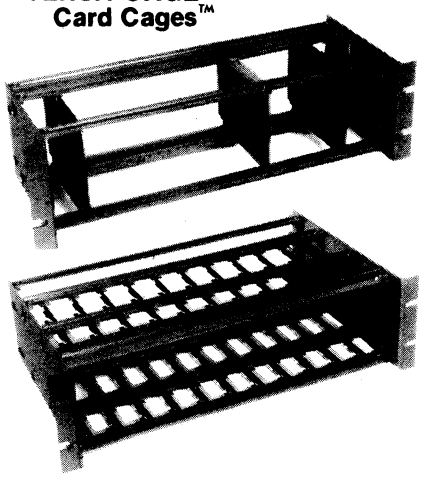
Fans are rated 100cfm . . . quiet, long lasting and efficient. Performance tested. Chart below shows performance characteristics on AC fans furnished on UNITRACK Fan-Pak.



Goshen Corporate Park
P.O. Box 1927
West Chester, PA 19380
(215) 692-0800 FAX 215-692-0801

UNITRACK®

VERSA-CAGE™ Card Cages™

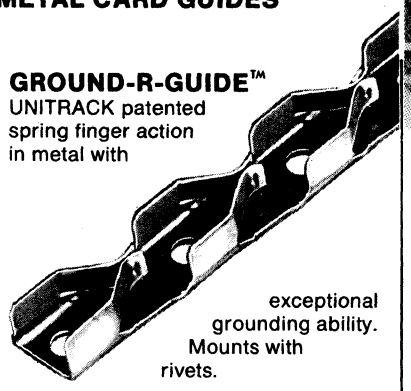


- Strong, sturdy, low cost and easy to assemble. Single and double 19″ cages.
- Sizes conform to industry standards.
- Card spacing can be .2″, .3″, ¼″, ½″ or ¾″ with pre-punched bars.
- Card guides snap into pre-punched holes in bars. (See UNITRACK card guide pages).
- Card Extractors can be used with extractor bars.

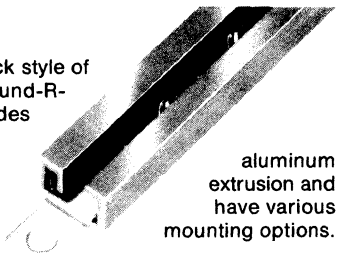
METAL CARD GUIDES

GROUND-R-GUIDE™

UNITRACK patented spring finger action in metal with exceptional grounding ability. Mounts with rivets.

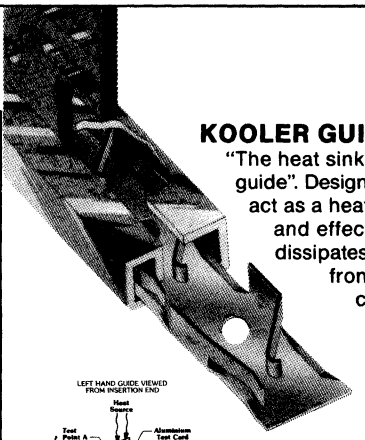


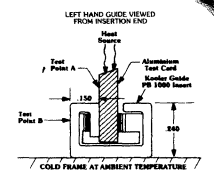
Track style of Ground-R-Guides use aluminum extrusion and have various mounting options.

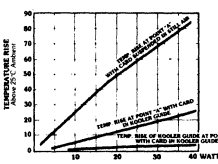


KOOLER GUIDE®

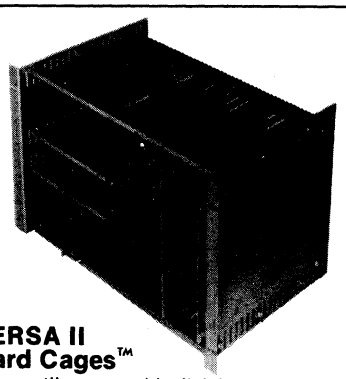
"The heat sink card guide". Designed to act as a heat sink and effectively dissipates heat from p.c. cards.





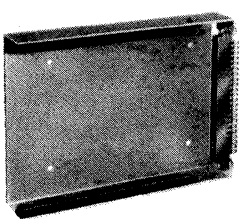


Various mounting methods cover practically any requirement. Thermal characteristics shown on graph indicate good heat transfer thru guides to cold frame or chassis.



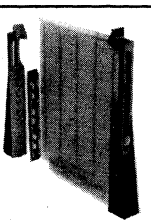
VERSA II Card Cages™

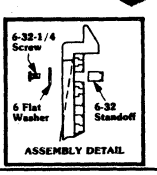
A versatile cage with divisions to accommodate various packages or large and small p.c. cards.



Single or Double Card Frame

Holds one or two STD bus cards. 22 or 28 position connectors and guides included.

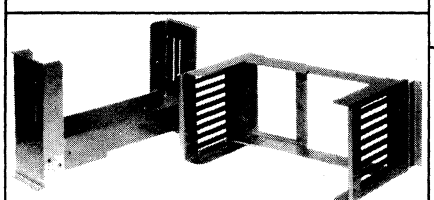




VERSAMOUNT™ and Card Lock

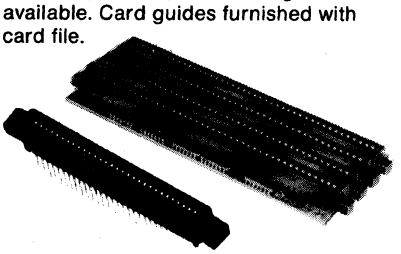
Mount single p.c. cards firmly to chassis or mother boards. Card Lock holds card in place. Available metal or plastic.

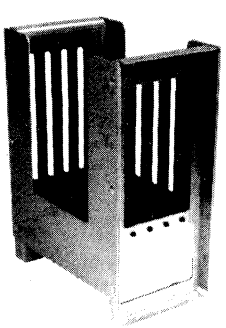
Dimensions in inches.



M-80 Card Files for Multibus Cards

Package Multibus cards from 2 to 20 card capacity. .600″ and .750″ spacing available. Backplanes, P-2 connectors (dual 30 position) and cooling fans available. Card guides furnished with card file.





STD 85 CAGES

Cages for STD Bus 4½″ × 6½″ cards. 4 to 16 card sizes. 22 or 28 position connectors available.

KOLOR-KODE™ Card Ejectors

Attaches to p.c. card using standard .250″ × .250″ hole locations. Available in 12 electronic colors. For 1/16″, 3/32″ or 1/8″ cards.

Card Pull

Strong polycarbonate in 12 colors for card identification. Attaches to p.c.card with rivets. Narrow enough for .300 card spacing.

UNITRACK INDUSTRIES INC.
1372 Enterprise Drive, P.O. Box 1927
West Chester, PA 19380
(215) 692-0800 • FAX 215-692-0801

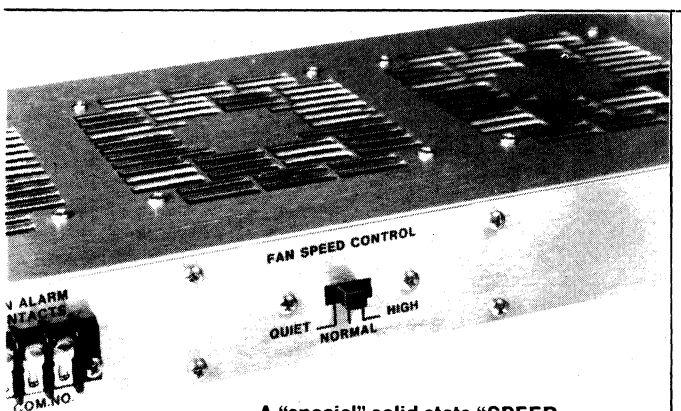
UNITRACK®

Let Unitrack help with your p.c. card packaging.

UNITRACK welcomes "Specials"

Over the years, Unitrack has worked closely with many design and packaging engineers. Out of this effort, numerous innovations have evolved.

A "special" p.c. card guide combines a unique spring action locking device with precise adjustment capabilities. Compress spring and card lock is removable for card extraction.

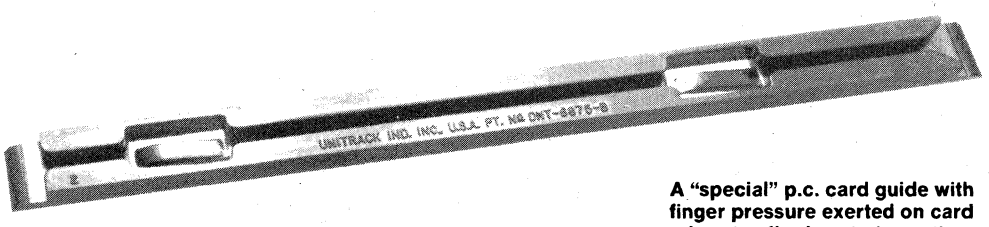


A "special" solid state "SPEED FAN CONTROL" provides 3 fan speeds for Unitrack card cooling packages.

VME BUS

All new Unitrack Card Cage System designed for both STE and VME Bus compatability!

SYSTEM



A "special" p.c. card guide with finger pressure exerted on card edges to afford centering action within the guides.

UNITRACK INDUSTRIES, INC.
1372 Enterprise Drive, P.O. Box 1927
West Chester, PA 19380
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UNITRACK®

COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

MINIGLOSSARIES FORMULAS • CHARTS PRODUCT SELECTION GUIDES FORMS CODES TECHNICAL INFORMATION

WHERE TO FIND THEM IN THE 88/89 EDITION OF EEM

Abbreviations/Acronyms .....A•1404, B•1090, C•1119 D•1156
AC Power Supplies, Product Selection Guide.....D•2156
ASCII Code .....D•1080
Batteries, Product Selection Guide....D•1447
Batteries & Fuel Cells, Characteristics.....D•1450
Cabinets, Enclosures, Racks & Chassis, Product Selection Guide.....C•1003
Capacitors, Basic Formulas.....A•1093
Capacitors, Miniglossary.....A•1066
Capacitors, Product Selection Guide .A•1002
Coils, Chokes, Inductors, Product Selection Guide.....A•1197
Conductors, Maximum Current Capacity of Copper & Aluminum... A•2272, C•1316
Connectors, Miniglossary.....C•1271
Connectors, Terminals & Sockets, Product Selection Guide.....C•1127
Crystals, Oscillators, Crystal & Piezoelectric Filters, Product Selection Guide.....A•1339
DC Power Supplies, Product Selection Guide.....D•1537
Delay Lines, Product Selection Guide.....A•1503
Dielectrics, Thermal Conductivity.....B•1916
Discrete Semiconductors, Product Selection Guide.....A•2154
Displays, Readouts, & CRTs, Product Selection Guide.....B•1041
EBCDIC Code .....D•1086
Encapsulation, Miniglossary.....C•1124
Fans, Blowers, Cooling Equipment, & Heat Exchangers, Product Selection Guide.....C•1631
Fiber Optics, Miniglossary .....B•1185
Fiber Optics, Product Selection Guide.....B•1204
Filters, Power, Product Selection Guide.....A•1642
Filters, Signal, Product Selection Guide.....A•1683
IC Master .....A•1740
Instruments, Test & Measuring, Product Selection Guide.....D•1210
Interconnection Systems, Product Selection Guide.....C•1702
Keyboards & Keypads, Product Selection Guide.....B•1854
Lamps, Lights, & Indicators, Product Selection Guide.....B•1126
Logofinder & Trademark Directories...C•901
Microwave Components, Product Selection Guide.....A•1776
Military Qualified Products List.....B•1002
Motors, Drives, & Rotating Components, Product Selection Guide.....B•1221
Opto Semiconductors, Miniglossary .....A•2169
Oscilloscopes, Product Selection Guide.....D•1426
Panel Hardware, Product Selection Guide.....C•1583
Panel Meters, Analog & Digital, Product Selection Guide.....D•1376
Potentiometers, Trimmers, Controls, & Rheostats, Product Selection Guide.....A•2078
Power Supplies, Miniglossary .....A•2276, D•1541
Power Supplies, AC, Product Selection Guide.....D•2156
Power Supplies, DC, Product Selection Guide.....D•1537
Protective Components (Fuses, Circuit Breakers, etc.), Product Selection Guide.....B•1351
Relay Contact Forms.....B•1450
Relays, Electromechanical, Miniglossary.....B•1414
Relays, Product Selection Guide.....B•1411
Resistor Color Codes.....A•1952
Resistors, Product Selection Guide ...A•1867
Servo Components, Miniglossary.....B•1266
SI Units, Basic Guide To, ...A•1434, B•1472, C•1692, D•1386
Solenoids, Product Selection Guide...B•1655
Switches, Product Selection Guide....B•1673
Symbols—International Authorities .....A•1454, B•1064, C•1104, D•1166
Thermal Components, Product Selection Guide.....B•1886
Thermal Conductivity of Dielectrics at Room Temperature.....B•1916
Thyristors/High Power Diodes, Miniglossary.....A•2211
Timers, Miniglossary..... B•1492, D•1140
Trademark & Logofinder Directories...C•901
Transducers & Encoders, Product Selection Guide.....B•1928
Transformers, Product Selection Guide.....A•2215
Voltage Drop Nomograph ..... A•2262, C•1469, C•1960 D•1718
Wire & Cable, Product Selection Guide.....C•1755
Wire Gauges—Diameter, Area, Copper Weight..... C•1343, C•1759

VECTOR ELECTRONIC COMPANY

VECTOR ELECTRONIC COMPANY, 12460 Gladstone Ave., Sylmar, CA 91392-9208
Phone 818-365-9661, FAX: 818-365-5718 Call Toll Free in CA 800-426-4652,
Outside CA 800-423-5659 (For custom configurations contact factory directly.)

Card Cages and Packaging Products

A complete selection of products for a full range of requirements. Vector provides a comprehensive selection of standard card cages and packaging products. Designed for flexibility, virtually all products can be modified–by the user or per special order–to meet special needs.

All products feature:

- Anodized aluminum construction
- Pre-drilled, adjustable cross members
- Slotted sidewalls and end pieces

Available in American and Euro (DIN based) sizes, card cages are provided assembled or as economical, easy-to-assemble kits and can be ordered in a variety of configurations including:

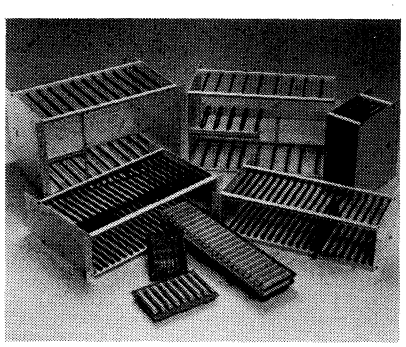
- Card Cages with Backplanes
- Card Cages with Card Guides (3 types of card guides available)
- Card Cages with Card Modules
- Frame only.

Card mounting methods meet requirements for most card sizes, types, and spacing. Choose from:

- Easy, snap-in nylon card guides
- Riveted plastic or aluminum, fixed card guides
- Aluminum continuous plate card guides.

Card mounting modules – EFP, Cardmount, also available, for attenuation requirements or for mounting components on front panels.

Custom orders welcome. A complete selection of backpanels, enclosures, filler panels, handles, piece parts, and accessories also available.



Vector-Pak® Card Cages

Part No.	Ass'y Kit	Dimensions Width	Height	Depth	Card Size Height	Width	Card Guides Type	Number	Backplane
CCK12S	K	19	5.25	9	4.5	3.0 to 5.0	Nylon, press-in	42	
CCK12S-H	K	10.25	5.25	9	4.5	3.0 to 5.0	Nylon, press-in	22	
CCK13F	K	19	5.25	9	4.5	3.0 to 5.0			
CCK13S	K	19	5.25	9	4.5	5.5 to 7.0	Nylon, press-in	42	
CCK13S-16	K	19	5.25	9	4.5	5.5 to 7.0	Nylon, press-in	42	16-slot STD
CCA13S	A	19	5.25	9	4.5	5.5 to 7.0	Nylon, press-in	42	
CCA13M	A	19	5.25	9	4.5	5.5 to 7.0	Zinc, riveted	42	
CCA13C	A	19	5.25	9	4.5	5.5 to 7.0	Aluminum, continuous		
CCM13S	A	19	5.25	9	4.5	5.5 to 7.0	Nylon, press-in	32	
CMA13-16	A	19	5.25	9	4.5	7.0	EFP module, 1.6"	20	
CMA13-20	A	19	5.25	9	4.5	7.0	EFP module, 2.0"	16	
CCK13S-H	K	10.25	5.25	9	4.5	5.5 to 7.0	Nylon, press-in	22	
CCK13S-HT	K	8.12	5.25	8.12	4.5	5.5 to 7.0	Nylon, press-in	20	
CCK13S-HT8	K	8.12	5.25	8.12	4.5	5.5 to 7.0	Nylon, press-in	20	8-slot STD
CCK14F	K	19	5.25	8.12	4.5	8.6 to 10.1			
CCA14S	A	19	5.25	12	4.5	8.6 to 10.1	Plastic, riveted	42	
CCM14S	A	19	5.25	12	4.5	8.6 to 10.1	Nylon, press-in	32	
CMA14-16	A	19	5.25	12	4.5	10.0	EFP module, 1.6"	32	
CMA14-20	A	19	5.25	12	4.5	10.0	EFP module, 2.0"	16	
CMA14-30	A	19	5.25	12	4.5	10.0	EFP module, 3.0"	10	
CCK15F	K	19	7	9	6.25	8.6 to 10.1			
CCM15S	A	19	7	12	6.25	8.6 to 10.1	Nylon, press-in	32	
CCK17F	K	19	8.75	12	8.0	8.6 to 10.1			
CCA17S	A	19	8.75	12	8.0	8.6 to 10.1	Nylon, press-in	42	
CCK18F	K	19	10.50	15.75	9.75	11.0 to 13.5			
CCK100S	K	19	12.25	9	10.0	4.0 to 8.5	Nylon, press-in	42	

Vector Europackaging Card Cages

Part No.	Ass'y Kit	Dimensions Width	Height	Depth	Card Size Height	Width	Card Guides Type	Number	Backplane
CCK160-3U	K	19	5.21	9.27	3U	160MM	Noryl, press-in		
CCA160-3U	A	19	5.21	9.27	3U	160MM	Noryl, press-in		
CCB160-3U2	A	19	5.21	9.27	3U	160MM	Noryl, press-in	24	12-slot J1
CCB160-3U1	A	19	5.21	9.27	3U	160MM	Noryl, press-in	42	21-slot J1
CCK220-3U	A	19	5.21	11.63	3U	220MM	Noryl, press-in		
CCA220-3U	A	19	5.21	11.63	3U	220MM	Noryl, press-in		
CCK160-6U	K	19	10.46	9.27	6U	160MM	Noryl, press-in		
CCK160-6UQ	K	4.36	10.46	9.39	6U	160MM	Noryl, press-in		
CCK160-6UH	K	8.36	10.46	9.39	6U	160MM	Noryl, press-in		
CCA160-6U	A	19	5.21	9.27	6U	160MM	Noryl, press-in		
CCB160-6U2	A	19	10.46	9.27	6U	160MM	Noryl, press-in	24	12-slot J1
CCD160-6U2	A	19	10.46	9.27	6U	160MM	Noryl, press-in	24	12-slot J1, J2
CCP160-6U2	A	19	10.46	9.27	6U	160MM	Noryl, press-in	24	12-slot J1/J2 Monolithic
CCP160-6U1	A	19	10.46	9.27	6U	160MM	Noryl, press-in	42	21-slot J1, J2
CCK220-6U	K	19	10.46	11.63	6U	220MM	Noryl, press-in		
CCA220-6U	A	19	10.46	11.63	6U	220MM	Noryl, press-in		
CCK280-6U	K	19	10.46	14.0	6U	280MM	Noryl, press-in		
CCA280-6U	A	19	10.46	14.0	6U	280MM	Noryl, press-in		
CCK340-6U	K	19	10.46	16.36	6U	340MM	Noryl, press-in		
CCA340-6U	A	19	10.46	16.36	6U	340MM	Noryl, press-in		
CCK400-6U	K	19	10.46	18.72	6U	400MM	Noryl, press-in		
CCA400-6U	A	19	10.46	18.72	6U	400MM	Noryl, press-in		
CCK220-9U	K	19	15.71	11.63	6U	220MM	Noryl, press-in		
CCA220-9U	A	19	15.71	11.63	9U	220MM	Noryl, press-in		
CCA280-9U	A	19	15.71	14.0	9U	280MM	Noryl, press-in		
CCK280-9U	K	19	15.71	14.0	9U	280MM	Noryl, press-in		
CCK340-9U	K	19	15.71	16.36	9U	340MM	Noryl, press-in		
CCA340-9U	A	19	15.71	16.36	9U	340MM	Noryl, press-in		
CCK400-9U	K	19	15.71	18.72	9U	400MM	Noryl, press-in		
CCA400-9U	A	19	15.71	18.72	9U	400MM	Noryl, press-in		

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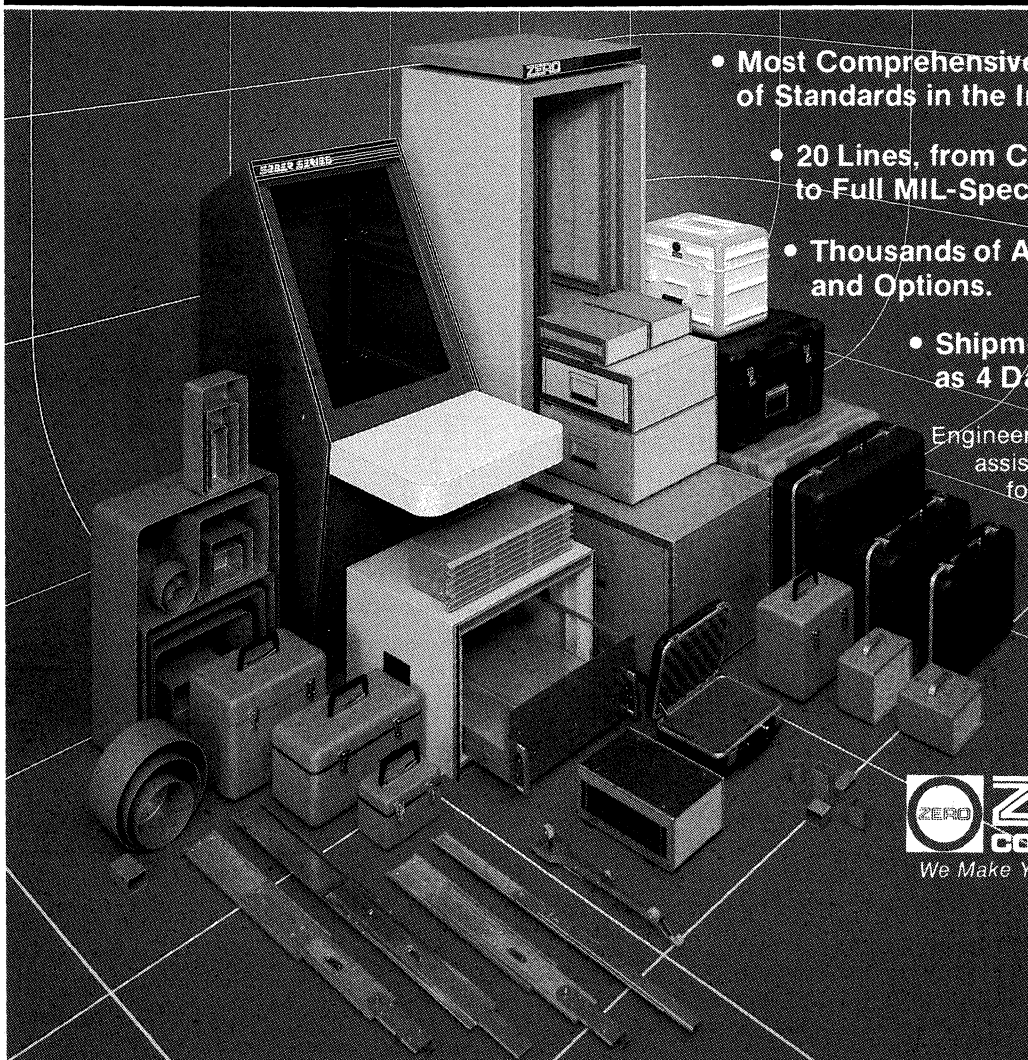

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Wide range of standards, in top/rear/multi-angle discharge. Low noise. 200 to 1200 CFM. Full range of options.

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Save design and engineering time. Simple part number ordering assures compliance to all major specs.

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Capacities from 80 to 275 lbs/pair. Roll formed steel or aluminum. Broad selection of handles, retractors, etc.

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ELECTRICALLY CONDUCTIVE SHIELDING, RESISTOR, AND ANTI-STATIC COATINGS

For Research and Production in: Electronics, Medicine, Aerospace, Electro-Mechanics, Communications

CONDUCTIVE COATINGS SELECTOR TABLE

Conductive paint catalog numbers See descriptions below.	Most Frequent Uses							
	Gold Replacement	Surface Mounting	RF Shield	Aircraft Precip. Static	Membrane Switches	Static Shield	Anti-static Flooring	Sensors: Stretch, Bend, Timing
N and CN series			√		√	√		√
4c series	√	√						
CPA series	√	√						
RSE100				√		√	√	
RA2			√	√		√	√	
SC12, 13, 15, 20					√	√		√
RS17 series			√			√	√	√
RSE22			√				√	√

DESCRIPTIONS OF PAINTS LISTED ABOVE

4c SERIES OF GOLD CONTACT REPLACEMENTS

May be carried as a shirt pocket kit for field repair of worn or defective gold plated contacts or to upgrade base metal contacts. It is applied in seconds as part of normal trouble shooting procedure. Each $68, shirt pocket kit for electronic field service representatives can save over $3520 in reduced board float, call-backs, and preventative maintenance.

May also be applied on original equipment contacts by production methods. There is no need for electroplating equipment, chemical disposal, or product design changes except for the elimination of gold plating and the substitution of a 4c material by far simpler application methods which may include brushing, dipping, spraying, or banding. Even electronic and electrical battery-operated games and toys can have the dependability of gold without the cost.

These 4c gold substitutes offer one of the most effective technologies available to increase reliability in two areas: A — Reducing the cost and consumer irritation of servicing the millions of your products already in the field, and, B — By adding them to your future production, assure maximum reliability and the reputation that results from reduced manufacturing costs and reduced field repairs. FREE DATA

SHIELDING LARGE STRUCTURES FROM ELECTROMAGNETIC INTERFERENCE (EMI)

New Shielding Method:
Reduces cost up to 80%
Reduces time 90% to 95%
Simplifies planning
Stands rough treatment

FINALLY
Do-It-Yourself Shielding

The WORRY-FREE shielding for a building, a cabinet, or a phonograph cartridge.

The new NR2HF synthetic rubber shielding combines the three KEY advantages of, 1 — Fast, low cost application by painting, 2 — Very high shielding effectiveness (up to 90 dB and, 3 — Ability to survive warping, building settling, vibration, and shock that would crack prevous shielding paint or open the seams of metal enclosures. It is INSURANCE against FUTURE problems. Applied quickly in production or in the field by spray, roller, brush, or dip. Samples available to shielding consultants and to potential shielding users. FREE DATA

CPA SERIES OF CONDUCTIVE ADHESIVES

These new circuit assembly materials provide a fundamentally new approach to simplifying a wide range of electrical connections such as surface mounted components, simplified connectors, and elimination of mechanical fasteners. For example, a pocket radio or TV set or wrist watch or washing machine or auto dash board circuitry can be designed to be assembled with far fewer parts and assembly operations. Surface mounted circuit board manufacture using the new Micro-Circuits assembly methods eliminates seven out of eight major items of assembly equipment and 57 of the 72 areas of cost that now limit acceptance of surface mounting. Like the 4c materials above, these products offer one of the most powerful new technologies now available for simplifying and miniaturizing electronic products. FREE DATA

AIRCRAFT ANTISTATIC AND RAIN EROSION RESISTANT PAINT

RSE100 paint is used for radomes and antenna covers. Used world-wide for over 20 years. One of our most goof-proof products. May be overcoated with decorative aircraft paints if our RA2 Antistatic Additive is mixed into the decorative paint to prevent static puncture damage and loss of antistatic effectiveness. RSE100 is very abrasion and chemical resistant as an antistatic flooring. May be overcoated with conventional floor coatings containing RA2 Antistatic Additive. RSE22 is similar to RSE100 but has a resistance of less than 200 ohms for shielding, ground planes on boat hulls, etc. FREE DATA

STATIC ELECTRICITY PROTECTION

Static electricity protection is becoming critically important in sensitive equipment, computer rooms, electronic warehouses, assembly lines and assembly benches, many hospital areas, chemical processing plants, and similar areas. The RSE100 Antistatic paint (see above) may be used on floors, walls, tables, furniture, etc. The RA2 Antistatic Additive (see above) permits the use of decorative, protective, and color-coding where such paints would previously have caused static problems. FREE DATA

SC12, SC13. SC20, AND SC15 SILVER PAINTS

These are conductive silver paints and inks used to form "wires", electromagnetic shielding, cold soldering of fine wires, reversing contacts on recording tape, conductive areas on paper and plastic parts, adjusting resistors, coils, capacitors, and pots. They have been used by magicians and to indicate fracture of rocks and aircraft parts. SC20 is for human skin electrodes. FREE DATA

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eem MINIGLOSSARY ENCAPSULATION

MATERIALS/HANDLING

Catalyst: A substance which changes the *rate* of chemical reaction. Very small quantities can cause fast change.

Conformal coating Sprayed or dipped. A thin conformal jacket which protects an assembly from moisture or other degrading environments.

Curing agent: See catalyst.

Hardener: See catalyst.

Hermetic: A permanent gas-tight seal.

RTV: Room Temperature Vulcanizing. Associated with silicone rubber sealants which vulcanize at room temperature.

Thermoplastic: Plastic materials which can be made to flow *repeatedly* with the application of heat.

Thermosetting: Plastics which once cured cannot be made to flow again.

Thixotropy: The property of a coating compound which has low viscosity when agitated, but which thickens when the agitation ceases.

Viscosity: Measured in units of *poise* or *centipoise*. The property of a liquid which resists internal flow. Low viscosity equates with thin and vice-versa.

PROCESSING

Casting: Parts or assemblies are placed in a mold. Encapsulating material is added and cured. Part is then removed from the mold.

Dip coating: Part or assembly is dipped into the encapsulating material. Final thickness is determined by number of dips, viscosity, rate of withdrawal, and temperature.

Embedding: Wherein an encapsulant substantially fills all voids in and about an assembly.

Impregnation: A process of encapsulation involving evacuating all air and then allowing the encapsulating material to flow in and fill all voids.

Molding: Similar to casting except this process usually implies multicavity molds and costly machines.

Potting: Wherein the part or assembly is immersed in an encapsulating material contained in a shell which becomes a permanent outer surface after curing.

DIELECTRIC

Arc resistance: An encapsulant's resistance to the formation of a conductive path or track. Measured in time.

Breakdown voltage: The voltage at which an encapsulant fails electrically.

Capacitance: The property of conductors and dielectrics which allows the storage of an electrical charge when the voltage is applied.

Corona: A luminous discharge of electricity due to air ionization when a certain voltage is reached. Can be internal or external. The formation of ozone can cause rapid deterioration of certain materials.

Dielectric: Insulator (Nonconductor.)

Dielectric constant: The property of a material that determines its ability to store electrostatic energy.

Dielectric strength: The ratio of dielectric breakdown to the thickness of insulating material.

Dissipation factor: The ratio of a dielectric material's energy losses.

Flashover: Point at which an electric discharge occurs around an edge or across a surface. Can result in a carbon track and permanent degradation.

Insulation resistance: (IR) An insulating material's total DC leakage.

Surface resistivity: The resistance of the surface of an insulating material to the flow of direct current.

Voltage endurance: Sometimes called corona resistance. The ability of a material to withstand the application of sustained high voltage.

Volume resistivity: The resistance of a material to direct current flow as a measure of volume. Expressed as ohm-centimeters.

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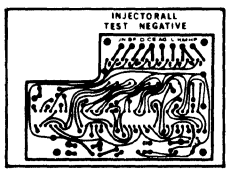
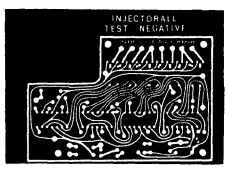


POSITIVE ARTWORK



NEGATIVE ARTWORK

Copper clad laminates available as:
1. Uncoated;
2. Negative resist coating; or
3. Positive resist coating.

WE ARE AFFILIATED WITH A QUALITY PC HOUSE FOR PROTOTYPES AND SMALL RUNS.

UNCOATED

Size	Copper Thickness	CEM Cat. Nos. 1 side	CEM Cat. Nos. 2 sides	FR4 Cat. Nos. 1 side	FR4 Cat. Nos. 2 sides	Copper Thickness	CEM Cat. Nos. 1 side	FR4 Cat. Nos. 1 side	FR4 Cat. Nos. 2 sides	Copper Thickness	FR4 Cat. Nos. 1 side	FR4 Cat. Nos. 2 sides	Copper Thickness	FR4 Cat. Nos. 1 side
3 × 4½	1 oz.	PC1-CEM	PC9-CEM	PC5	PC40	2 oz.	PC5-CEM	PC9	PC51	1 oz.	PC55	PC44	1 oz.	PC60
*4½ × 6½	1/16″	—	—	PC6A	PC41A	1/16″	—	—	—	1/32″	—	—	.010	—
4 × 6″		PC2-CEM	PC10-CEM	PC6	PC41		PC6-CEM	PC10	PC52		PC56	PC45		PC61
6 × 9		PC3-CEM	PC11-CEM	PC7	PC42		PC7-CEM	PC11	PC53		PC57	PC46		PC62
*4½ × 9½″		—	—	PC6B	PC41B		—	—	—		—	—		—
12 × 18		PC4-CEM	PC12-CEM	PC8	PC43		PC8-CEM	PC12	PC54		PC58	PC47		PC63
24 × 36		PC4-CEM-1	PC12-CEM-1	PC8-1	PC43-1		PC8-CEM-1	PC12-1	PC54-1		PC58-1	PC47-1		PC63-1
36 × 48		PC4-CEM-2	PC12-CEM-2	PC8-2	PC43-2		PC8-CEM-2	PC12-2	PC54-2		PC58-2	PC47-2		PC63-2

DRY FILM — NEGATIVE RESIST BOARDS (BLACK BAG — GREEN HEADER) USE WITH INJECTORALL D1 DEVELOPER

3 × 4½	1 oz.	PC1-CEMF	PC9-CEMF	PC17F	PC40F	2 oz.	PC5-CEMF	PC9F	PC51F	1 oz.	PC55F	PC44F	1 oz.	PC60F
*4½ × 6½	1/16″	—	—	PC6AF	PC41AF	1/16″	—	—	—	1/32″	—	—	.010	—
4 × 6		PC2-CEMF	PC10-CEMF	PC18F	PC41F		PC6-CEMF	PC10F	PC52F		PC56F	PC45F		PC61F
6 × 9		PC3-CEMF	PC11-CEMF	PC19F	PC42F		PC7-CEMF	PC11F	PC53F		PC57F	PC46F		PC62F
*4½″ × 9½″		—	—	PC6BF	PC41BF		—	—	—		—	—		—
12 × 18″		PC4-CEMF	PC12-CEMF	PC19AF	PC43F		PC8-CEMF	PC12F	PC54F		PC58F	PC47F		PC63F

POSITIVE RESIST BOARDS (BLACK BAG — BLUE HEADER) USE WITH INJECTORALL D3 DEVELOPER

3 × 4½	1 oz.	PC1-CEMP	PC9-CEMP	PC17P	PC40P	2 oz.	PC5-CEMP	PC9P	PC51P	1 oz.	PC55P	PC44P		—
*4½ × 6½	1/16″	—	—	PC6AP	PC41AP	1/16″	—	—	—	1/32″	—	—		—
4 × 6		PC2-CEMP	PC10-CEMP	PC18P	PC41P		PC6-CEMP	PC10P	PC52P		PC56P	PC45P		—
6 × 9		PC3-CEMP	PC11-CEMP	PC19P	PC42P		PC7-CEMP	PC11P	PC53P		PC57P	PC46P		—
*4½ × 9½″		—	—	PC6BP	PC41BP		—	—	—		—	—		—
12 × 18″		PC4-CEMP	PC12-CEMP	PC19AP	PC43P		PC8-CEMP	PC12P	PC54P		PC58P	PC47P		—

***NOTCHED TO FIT 22/44 CARD EDGE CONNECTOR. NOTCHED BOARDS AVAILABLE IN ANY SIZE.**

Special Cuts available in sizes from 2″ × 3″ up to 12″ × 18″. One or two sides copper clad and as uncoated or positive or negative coated. Please specify coating required and type from chart shown above. There is no charge for cutting and price is based on area. Minimum order for special cuts. 6 pieces each size.

ELECTRONIC CHEMICALS

For the preparation and preservation of your PC Boards and Electronic Devices.

COMPUTER CLEANER
CONTACT CLEANERS
CONFORMAL COATINGS
DEGREASERS
DEVELOPERS
ETCHANT
STRIPPERS
FREEZER SPRAYS

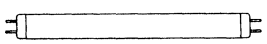
CIRCUIT BOARD DRILL BITS

Specially designed for smooth, burr-free drilling in printed circuit boards. Made of high speed tool steel or CARBIDE.

Drill Bit	Diameter	
69	.029	No. PC 300-69 10 pcs. of #69
66	.033	No. PC300-66 10 pcs. of #66
60	.040	No. PC300-60 10 pcs. of #60
52	.062	No. PC300-52 10 pcs. of #52
No. PC300-Kit		4 bits (1 of each)

For CARBIDE BITS add a "C" to the catalog no. i.e. PC300C Kit, PC300C-69.

NEW No. PC557F ULTRAVIOLET LIGHT SOURCE



Use to expose positive or negative sensitized material. 25W 18″ bi-pin

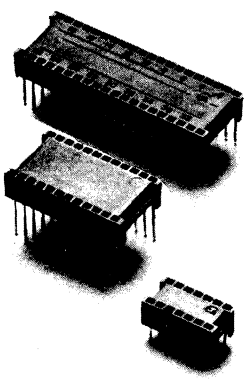
PC WIK®

For desoldering component leads from a PC Board or removing solder from almost any connection. PC WIK® removes the solder by capillary action. Simple to use. Meets MIL SPEC MIL-F-14256D TYPE "R". Meets NASA Publications NHB5300 .4 (3A), NPC 200-4, SP-5002.

available in 5′, 25′, & 100′ lengths. sizes: .05, .075, .100, .150 widths.

IC SOCKETS

WIRE-WRAP **SOLDER TAIL**



KIT 551

Photo reversing kit produces professional positives or negatives: 3 sheets 4″ × 6″ film, developer, fixer, toner, 75W black light bulb and instructions.
NEW CLEAR FILM

KIT 650

Photo-etch kit using boards with negative DRY FILM resist: 2-3″ × 4″ neg. sensitized single side boards, exposure glass, tray, chemicals, drill bit, spring clips and complete instructions and exposure lamp.

KIT 750

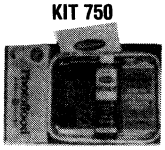


Photo-etch kit using 2 sided boards with negative DRY FILM resist: 2-3″×4″ sensitized boards, exposure glass, spring clips, trays, chemicals, drill bits, exposure lamp and more. Complete instructions.

KIT 850

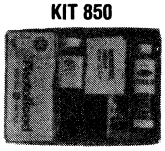


Photo-etch kit using boards with positive resist: 2-3″ × 4″ pos. sensitized single side boards, glass, tray, pen, art aids, chemicals, clips, drill bit, exposure lamp and complete instructions.

POSITIVE RESIST

For sensitizing boards. High quality positive resist which will cause less pinholing. Available in 3 oz. aerosol spray can. Has less sensitivity to white light than other resists.
PC197-3

DRAFTING AIDS

PC22

DRAFTING TAPE

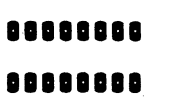
720″ rolls of etch resist tape in widths of: .031, .040, .062, .080, .093, .125, .156, .200 and .250 inches. Pressure sensitive.

PC23

DONUT TERMINAL PADS

Pressure sensitive, etch resistant in sizes from .062″ with .031 hole up to .500″ with .062″ hole in ten sizes. Pkgs of 40, 250 or 1000 depending on size.

PC28



DUAL IN-LINES

Pressure sensitive, .002″ accuracy. 1:1 and 2:1 ratio. Pin pads: 8, 14, 16, 18, 20, 22, 24, 28 and 40. Pkgs. of 8 or 100.

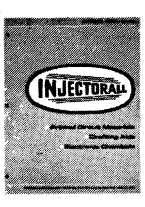
TAPE HEAD CLEANING STICKS
For Tape Recorder Heads

TAPE HEAD CLEANING STICKS are 6 inch cotton-tipped wooden swabs. They are excellent to reach dirty recorder heads without taking the tape recorder apart. Packed 100 on a hanging package.

No. 255 Cotton Tip 6″ wooden handle
No. 256 Foam Tip 6″ wooden handle
No. 257 Round Foam Tip 4″ poly handle
No. 258 Rect. Foam Tip 6″ poly handle
No. 259 Two-sided Foam Tips 6″ poly handle
No. 261 Mini Foam Tip 2¾″ poly handle

TAPE HEAD CLEANER #250-2 2 oz btl

BULK PACKS AVAILABLE



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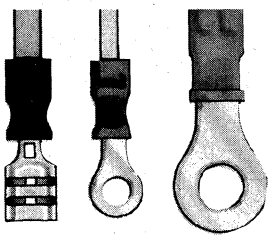
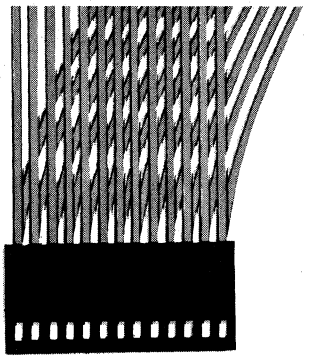
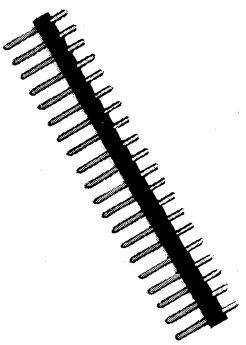
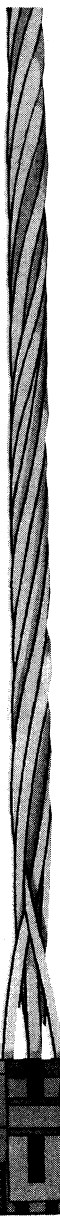
Woman Owned Small Business





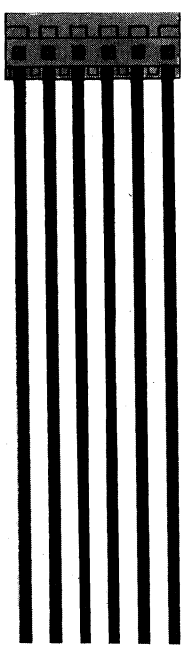




INDUSTRY STANDARD PRODUCTS

In stock and ready to ship from AMP

the products . . . . . and where to find them in EEM



.050″ Centerline Mass-Terminated Ribbon Cable Connector System (AMP-LATCH) ..... C•1158

.100″ and .156″ Centerline Mass-Terminated Discrete Wire Wire/Ribbon Cable Connector Assemblies (MTA) ..... C•1166

.025″ Sprare or Round Posts, Headers and Receptacles (AMPMODU) ..... C•1186

Subminiature D Connectors (AMPLIMITE) ..... C•1194

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RF Coaxial Connectors ..... C•1227

IC Sockets (DIP, SIMM, HPT, PGA) ..... C•1242

Printed Circuit Board Switches and Shunts ..... C•1249

Terminals and Splices (PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND) ..... C•1252

Electro-Optic Connectors (OPTIMATE) ..... C•1261

For Product Information or How to contact your authorized AMP Distributor - Call 1-800-522-6752

CONNECTORS, CABLE-TO-CABLE/PANEL

Manufacturer	Starting EEM Page No.	Series/ Model No.	Type Connector: Circular	Coax/ Triax	Flat Cable	Rectangular	D-Subminiature	Connection: Solder	Solderless	No. Conductors: Single	Multi	Angle: Right Angle	Parallel	Special Features
ABL Electronic Supply	C•1308			√										
Airborn, Inc.	C•1132	.100" + .075"			√		√	√			√	√	√	High density, LIF/ZIF, Header
Alden Products Co.	C•1144	9000 Series	√					√		√	√	√	√	Envrnmt. resist., Power, Hi rel, Quick disconn., Locking, Polarization
Amp Inc.	C•1156			√	√	√	√	√	√	√	√	√	√	High density, Power, Hi rel, Low signal, Quick disconn., Locking, LIF/ZIF, Free hanging, Header, Polarization
Amphenol Corp.	C•1266		√	√	√	√	√	√	√	√	√	√		Herm. sealed, Envrnmt. resist., High density, Power, Hi rel, Locking, Header, Polarization
Amphenol/Spectra Strip	C•1287			√	√		√	√	√			√		Herm. sealed, Envrnmt. resist., High density, Hi rel, Locking, Header, Polarization
Augat Interconnection	C•1278							√	√		√	√		High density
Beau Products Div.	C•1290					√	√	√	√			√	√	Power, Low signal, Quick disconn., Locking, Free hanging, Polarization
Carrot Components	C•1297	BLC/MIT	√		√		√	√	√		√	√	√	Herm. sealed, Quick disconn., Header, Polarization
Caton Connector Corp.	C•1300	KAM		√		√				√				Herm. sealed, Envrnmt. resist., Power, Hi rel, Quick disconn., Free hanging
Cinch Connector Corp.	C•1305		√			√	√	√	√		√	√	√	HIgh density, Power, Hi rel, Low signal, Polarization
Component Mfg. Serv.	C•1309		√	√	√	√				√	√	√	√	Envrnmt. resist., High density, Power, Free hanging
Concord Electronics	C•1312		√	√										
Connector Corp.	C•1314		√					√	√	√	√	√	√	Polarization
CW Industries	C•1320				√		√		√		√	√	√	High density, Header, Polarization
DSA Inc.	C•1330		√	√				√	√	√	√			Herm. sealed, Envrnmt. resist., High density, Quick disconn.
Du Pont Co.	C•1331				√			√	√	√	√	√	√	High density, Hi rel, Quick disconn., Locking, Plrzn.
Elastomeric Technologies	C•1344				√				√		√	√	√	Herm. sealed, Envrnmt. resist., High density
Elfab Corp.	C•1346				√			√	√		√		√	
EPD Electronics	C•1349			√				√	√	√	√	√		Quick disconn.
E-Z Hook	C•1350	WE310(PJ5)	√	√										Quick disconn., Locking
Fischer Connectors, Inc.	C•1353		√	√				√	√	√	√	√	√	Herm. sealed, Envrnmt. resist., High density, Power, Hi rel, Low signal, Quick disconn., Locking, Free hanging, Polarization
Fujitsu Comp. of America	C•1361				√		√		√		√	√	√	High density
Globtek Inc.	C•1369	PZ						√	√	√	√	√	√	Power, Quick disconn., Polarization
Hirose Electric USA	C•1378	HR10, 12; FL; H1F6H; DN; DX	√	√	√									High density
Hypertronics Corp.	C•1382	D	√					√	√		√		√	Quick disconn., Locking, LIF/ZIF
ISL Products Int'l Ltd.	C•1386		√	√	√	√	√	√	√	√	√	√	√	Low signal, Quick disconn., Locking, Header
ITT Pomona Electronics	C•1477			√								√		
Preh Electronic Industries	C•1514		√					√	√		√	√		Quick disconn., Locking
JAE Industries Inc.	C•1388		√		√	√	√	√			√	√	√	High dens., Quick disconn., Locking, Header, Plrztn.
Jettron Products Inc.	C•1392		√	√						√	√	√	√	Herm. sealed, Envrnmt. resist., Power, Hi rel, Locking
Kycon Cable and Conn.	C•1398				√			√		√	√	√	√	High density, Polarization
Lemo USA Inc.	C•1401	All	√	√				√	√	√	√	√		Envrnmt. resist., High density, Quick disconn.
LZR Electronics Inc.	C•1415		√	√	√			√	√	√	√	√	√	High density, Power, Locking, Polarization
3M Electronic Prod. Div.	C•1438				√					√	√	√	√	High density, LIF/ZIF, Free hanging, Header
Metuchen Capacitors Inc.	C•1442				√			√	√		√	√	√	Locking
Molex Inc.	C•1450			√	√			√	√	√	√			High density
Multi-Contact USA	C•1460		√					√		√		√	√	Power, Hi rel, Quick Disconn., Locking
Oxley Inc.	C•1465							√		√				
Panduit Corp.	C•1466				√						√			High density, Hi rel, Polarization
Panel Components	C•1470	Connectors, Power				√		√				√		Locking, Polarization
RayChem	C•1515		√					√		√			√	Herm. sealed, Envrnmt. resist., Free hanging
Rowe Industries Inc.	C•1517	RMC	√					√	√	√	√	√	√	Herm. sealed, Envrnmt. resist., Power, Hi rel, Quick disconn.
Schurter Inc.	C•1520	4300 - 4303				√		√				√		Power, Quick disconn.
Shogyo Int'l Corp.	C•1525		√	√	√	√	√	√	√	√	√	√	√	Herm. sealed, Envrnmt. resist., High density, Power, Hi rel, Low signal, Quick disconn., Locking
Specialty Electronics	C•1529													Locking, Header
Texas Instruments	C•1542	F-Series				√		√	√		√	√	√	Hi rel, Polarization
Thomas & Betts Corp.	C•1551				√		√		√		√	√	√	High density, Hi rel, Locking, LIF/ZIF, Header, Polarization
Trompeter Electronics	C•1554			√					√	√	√	√	√	High density, Low signal, Quick disconn., Locking
Virginia Plastics Co.	C•1558				√	√			√		√	√		Hi rel, Low signal, Quick disconn., Locking, Plrztn.
Zierick Mfg. Corp.	C•1580							√	√	√	√	√	√	High density, Power, Quick disconn., Locking

* MIL Spec.

CONNECTORS, PCB/FLAT CABLE

Manufacturer	Starting EEM Page No.	Series/ Model No.	Board to Chassis/ Mother Board: One Piece	Board to Chassis/ Mother Board: Two Piece	Board to Cable/ I/O: One Piece	Board to Cable/ I/O: Two Piece	For Ext. Board	Type or Feature	Contact Style: Cantilever	Contact Style: Pin	Contact Style: Bellow	Special Features
ABL Electronic Supply	C-1308											Rt. angle conts., Coax adder
Airborn, Inc.	C-1132	.050"		√		√	√	submicro		√		ZIF/LIF, Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Wirewrap
Amp Inc.	C-1156		√	√	√	√			√	√		ZIF/LIF, Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Wirewrap, Rt. angle conts., Pos. lock, Coax adder, Polarization
Amphenol Corp.	C-1266			√	√	√			√	√		Extractors, Gol conts., Cup/Eye/Tail solder, DIP/Flow solder, Wirewrap, Rt. angle conts. Pos. lock, Polarization
Amphenol/Spectra Strip	C-1287			√		√	√	IDC Conn.	√	√		
Augat Interconnection	C-1278		√	√	√	√				√		Wirewrap, Rt. angle conts.
Augat, RDI	C-1288					√						
Beau ProduCts. Div.	C-1290			√						√		Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Wirewrap, Rt. angle conts.
Carrot Components	C-1297	517/ 533	√	√	√	√						Rt. angle conts., Pos. lock, Polarization
Cinch Connector Corp.	C-1305		√	√	√	√	√		√	√	√	Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Rt. angle conts., Polarization
Components Corp.	C-1311	MDR-100	√		√							Gold conts., Polarization
CW Industries	C-1320		√	√	√				√	√		Gold conts., Cup/Eye/Tail solder, Inst. dis. contact, Wirewrap, Rt. angle conts., Pos. lock, Polarization
Dale Electronics	C-1325	EB4, EB6, EB7	√	√	√	√		Burn-in		√		Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Wirewrap
Du Pont Co.	C-1331	79412/10		√	√	√		.100" centers		√		Extractors, Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Rt. angle conts., Polarization
Elastomeric Technologies	C-1344		√	√	√	√						Rt. angle conts.
Elfab Corp.	C-1346		√	√	√	√				√		Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Wirewrap
Emulation Technology Inc.	C-1348											ZIF/LIF, Extractors, Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Wirewrap
Fujitsu Comp. of America	C-1361		√	√	√	√				√	√	Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Rt. angle conts., Pos. lock, Polarization
Hirose Electric USA	C-1378	H1F6H				√						
Hypertronics Corp.	C-1382	KA		√		√	√	QPL'ed to D55302/ 159-164		√		ZIF/LIF, Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Wirewrap, Rt. angle conts., Pos. lock, Extractors
JAE Industries	C-1388			√	√	√	√	Hi density		√		Gold conts., DIP/Flow solder, Rt. angle conts., Pos. lock, Polarization
Kycon Cable and Conn.	C-1398		√	√	√	√						Gold conts., DIP/Flow solder, Rt. angle conts., Plrztn.
LZR Electronics Inc.	C-1415	Series 57	√	√	√	√				√		Gold conts., Cup/Eye/Tail solder, Polarization
3M Electronic Prod. Div.	C-1438											Gold conts.
Metuchen Capacitors Inc.	C-1442		√							√		Wirewrap
Mill Max	C-1447		√		√					√		
Molex	C-1450		√	√	√	√				√		Gold conts., Inst. dis. contact
Multi-Contact U.S.A.	C-1460											Gold conts., DIP/Flow solder
Panduit Corp.	C-1466		√	√	√	√				√		Gold conts., Polarization
Preh Electronic Industries	C-1514									√		Gold conts.
Shogyo International Corp.	C-1525		√	√	√	√				√		DIP/Flow solder, Wirewrap, Rt. angle conts., Pos. lock, Coax adder
Sullins Electronics	C-1530	EZ Series	√		√			High or Low profile			√	Gold conts., DIP/Flow solder, Wirewrap, Rt. angle conts.
Teka Interconn. System	C-1538		√	√			√		√			Gold conts., Cup/Eye/Tail solder, Polarization, Wirewrap, Rt. angle conts.
Texas Instruments/ Connector Systems	C-1542	H-42	√						√			Gold conts., Dip/Flow solder, Rt. angle conts., Polarization
Thomas & Betts Corp.	C-1551		√	√	√	√			√	√		ZIF/LIF, Extractors, Gold conts., Cup/Eye/Tail solder, DIP/Flow solder, Inst. dis. contact, Rt. angle conts., Coax adder, Polarization
Trompeter Electronics	C-1554											Gold conts.
U.S. Components	C-1555			√						√		ZIF/LIF, Cup/Eye/Tail solder, DIP/Flow solder
Virginia Plastics	C-1558				√	√			√	√		Gold conts., DIP/Flow solder, Inst. dis. contact, Polarization
Weco Electrical Connectors	C-1563	93-97, 120, 150		√	√	√		93-97, 120, 150		√		Gold conts., DIP/Flow solder, Inst. dis. contact, Rt. angle conts., Pos. lock, Polarization
Zierick Mfg. Corp.	C-1580									√		Cup/Eye/Tail solder, Wirewrap

CONNECTORS, RACK AND PANEL

Manufacturer	Starting EEM Page No.	Series/Model No.	Contact		Two Piece II Mating	Special Features							
			Pin	Canti-lever		Crimp	Wire-wrap	DIP Solder	Cup/Eye Solder	Locking	Heads	Jack Screw	Hi Rel/ Mil.
Airborn, Inc.	C•1132	WTA-WTA	√		√		√	√	√	√		√	√
Alden Products Co.	C•1144	8100 Series											
Amp Inc.	C•1156		√	√	√	√	√	√	√	√	√	√	
Amphenol Corp.	C•1266					√	√	√	√	√			√
Amphenol/Spectra Strip	C•1287					√	√	√	√	√			
Beau Products Div.	C•1290		√				√		√	√			
Carrot Components	C•1297		√			√	√	√	√			√	
Cinch Connector Corp.	C•1305		√	√		√			√	√		√	√
Dale Electronics	C•1325	MM22, 24	√					√	√	√		√	√
Du Pont Co.	C•1331	PV	√			√				√			√
Elfab Corp.	C•1346		√		√	√	√	√	√				
Fujitsu Comp. of America	C•1361		√									√	
Globtek Inc.	C•1369	PX	√		√	√	√						
Hypertronics Corp.	C•1382	N	√		√	√	√	√	√	√		√	
Kycon Cable and Conn.	C•1398								√				
McKenzie Technology	C•1437		√				√	√					
Metuchen Capactitors	C•1442		√						√	√			
Mill Max	C•1447												√
Molex Inc.	C•1450		√		√								
Panduit Corp.	C•1466												√
Panel Components Corp.	C•1470	Power, Hi Power Connectors	√							√			
Superior Electric Co.	C•1532	Supercon	√										
Thomas & Betts Corp.	C•1551		√	√	√			√					√
Trompeter Electronics	C•1554					√				√			
U.S. Components	C•1555	MIW Series, UMI/COMI	√			√	√	√	√	√		√	√
Virginia Plastics Co.	C•1558		√										
Weco Electrical Conn.	C•1563	Series 300	√		√			√		√			

JACKS, PLUGS, ADAPTERS, PINS

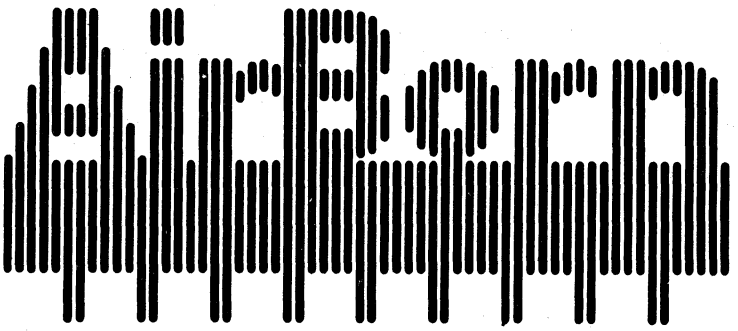
Manufacturer	Starting EEM Page No.	Jacks	Jack Adapters	Plug & Jack Sets	Plugs, Electric	Plug Adapters	Binding Posts	Pins, Elec. Cond.	Contacts, Electrical	Plugs, Power	Modules/ Receptacles, Power	Jumpers, Circuit Board	Clips, Test	Leads, Test	High Volt.
ABL Electronic Supply	C-1308		√	√		√							√	√	
Alden Products Co.	C-1144				√					√					√
Amphenol Corp.	C-1266							√	√						
Andron Electronics Corp.	C-1268	√						√	√				√	√	
Caton Connector Corp.	C-1300										√				√
Cinch Connector Corp.	C-1305	√	√							√	√				
Concord Electronics	C-1312	√	√	√			√	√	√			√	√	√	√
Connector Corp.	C-1314	√		√	√	√				√					
Corcom Inc.	C-1317										√				
Delta Products	C-1328										√				
Emulation Tech. Inc.	C-1348	√	√	√	√	√					√		√	√	
EPD Electronics	C-1349	√	√			√									
E-Z Hook	C-1350		√									√	√	√	
Fischer Connectors Inc.	C-1353	√	√	√	√					√					
Fujitsu Comp. of America	C-1361	√	√	√		√									
Gray Hill	C-1371						√		√				√		
Hirose Electric USA	C-1378	√			√										
ISL Products Int'l Ltd.	C-1386	√	√	√	√	√	√			√		√	√	√	
ITT Pomona Electronics	C-1477	√	√	√		√	√						√	√	
Jettron Products Inc.	C-1392									√					√
Jolo Industries Inc.	C-1394			√				√	√				√	√	
Kycon Cable and Conn.	C-1398	√		√											
LZR Electronics Inc.	C-1415	√		√	√		√			√			√		
McKenzie Technology	C-1437							√	√						
3M Electronic Products	C-1438												√		
Mill Max	C-1447		√			√	√	√	√						
Molex Inc.	C-1450	√		√	√						√				
Mueller Electric Co.	C-1452					√			√			√	√	√	√
Multi-Contact USA	C-1460	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Panel Components Corp.	C-1470				√					√					
Power Dynamics	C-1506				√					√	√				
Schurter Inc.	C-1520	√		√	√			√	√	√	√				
Shogyo International	C-1525	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Superior Electric Co.	C-1532			√	√		√			√					
Switchcraft, Inc.	C-1533	√	√	√		√				√	√				
Trompeter Electronics	C-1554	√	√	√		√									
U.S. Terminals	C-1557	√		√											√
Virginia Plastics	C-1558	√		√											
Weco Electrical Conn.	C-1563						√								√
Zierick Mfg. Corp.	C-1580						√	√					√		

SOCKETS

Manufacturer	Starting EEM Page No.	IC	DIP/ SIP	Pin Grid Array	Carrier	Transistor	Crystal	Battery/ Lamp	Relay	Tube	Test	Adapter
Airborn, Inc.	C•1132		√	√								
Amp Inc.	C•1156	√	√	√								
Andron Electronics Corp.	C•1268	√	√	√	√	√	√		√		√	√
Aries Electronics	C•1272		√	√	√	√			√		√	√
Augat Interconn., Prods.	C•1278	√	√									
Augat RDI	C•1288								√			
Bogen Communications	C•1294							√				
Cinch Connector Corp.	C•1305	√			√							
Connector Corp.	C•1314					√	√	√	√	√		
Curtis Industries	C•1318								√			
CW Industries	C•1320		√									
Elastomeric Technologies	C•1344	√										
Elfab Corp.	C•1346	√	√									
Emulation Technology Inc.	C•1348	√	√	√	√							√
E-Z Hook	C•1350										√	
Globtek Inc.	C•1369								√			√
Gray Hill	C•1371					√		√				
ISL Products Int'l Inc.	C•1386	√	√			√	√	√	√			
JAE Industries	C•1388	√	√									
Jolo Industries Inc.	C•1394	√	√									
LZR Electronics Inc.	C•1415					√		√				
McKenzie Technology	C•1437	√	√	√	√	√	√	√			√	√
3M Electronic Products	C•1438	√	√	√	√	√	√	√	√		√	√
Mill Max	C•1447	√	√	√	√	√	√	√	√		√	√
Molex Inc.	C•1450	√		√	√	√	√	√	√			
Multi-Contact U.S.A.	C•1460										√	√
J.M. Ney Co.	C•1463										√	
Oxley Inc.	C•1465										√	
Precicontact Inc.	C•1510	√	√	√	√							√
Shogyo International	C•1525	√	√					√			√	√
Specialty Electronics	C•1529							√				
Texas Instruments, Conn. Systems	C•1542	√	√	√	√						√	
Thomas & Betts Corp.	C•1551	√	√	√	√							

TERMINALS, TERMINAL BOARDS, BLOCKS, ETC.

Manufacturer	Starting EEM Page No.	Barrier Blocks	Terminal Boards	Terminal Strips	Terminals								
					Feed-thru	Lug	PCB	Standoff	Threaded	Wire-wrap	Solder-less	Push-on/ Quick Disconn.	Turret
Altech Corp.	C•1151		√	√	√		√	√	√		√	√	
Amp Inc.	C•1156					√					√	√	
Andron Electronics Corp.	C•1268				√			√					
Augat, RDI	C•1288	√			√		√			√	√	√	√
Beau Products Div.	C•1290	√		√	√	√	√	√	√	√		√	√
Bussman	C•1295	√	√	√									
Cinch Connector Corp.	C•1305	√											
Concord Electronics	C•1312			√	√	√		√					
Connector Corp.	C•1314		√								√	√	
Curtis Industries	C•1318	√	√	√	√	√	√	√	√	√	√	√	√
Globtek Inc.	C•1369	√	√	√		√	√	√	√		√	√	
Hiram Jones	C•1372				√		√	√	√				
ISL Products Int'l Ltd.	C•1386	√	√	√									
Jolo Industries Inc.	C•1394	√		√			√			√			
McKenzie Technology	C•1437						√			√			√
Mill Max	C•1447						√			√			√
Molex Inc.	C•1450	√	√	√									
Oxley nc.	C•1465				√		√			√			√
Panel Components Corp.	C•1470			√				√					
Shogyo International Corp.	C•1525	√	√	√	√	√	√	√	√	√	√	√	√
U.S. Terminals	C•1557	√	√	√			√				√		
Weco Electrical Connectors	C•1563	√	√	√	√	√	√	√			√	√	
Weidmuller Inc.	C•1576		√	√	√		√				√		
Zierick Mfg. Corp.	C•1580					√	√				√	√	



Known for Quality Connectors and On-Time Delivery:

.100″

2-, 3-, and 4-row subminiature connectors on .100″ centers from 6 to 200+ contacts. Qualified to MIL-C-55302. See "W" Series connectors on the following pages.

.075″

2- and 3-row subminiature connectors on .075″ centers from 10 to 206 contacts. Meet requirements of MIL-C-55302. See "R" Series connectors on the following pages.

.050″

2-, 3-, and 4-row microminiature connectors on .050″ centers from 9 to 100 contacts. Now qualified to MIL-C-83513. See "M" Series on pages. Also strip connectors on .050″ centers.

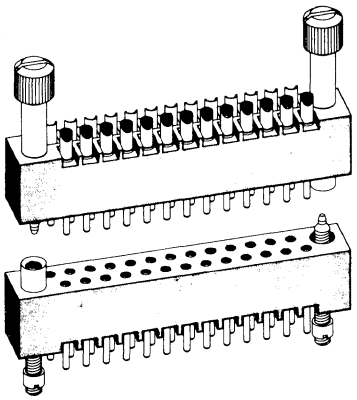
QPL

"W" Series connectors are qualified to MIL-C-55302. And now the "M" Series connectors are qualified to MIL-C-83513.

ADS

Our exclusive AirBorn Distributor Service can provide parts often within hours. Call the appropriate Customer Service Number on each catalog page.

AIRBORN INC. / 4321 AIRBORN DRIVE / P.O. BOX 519 / ADDISON FAX 214-931-9305



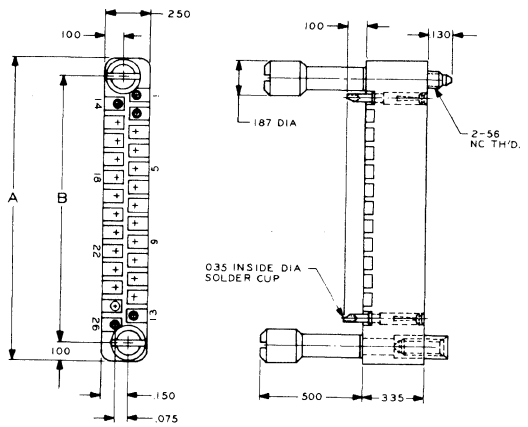
WTA26PCJT

WTA26SAD9JL

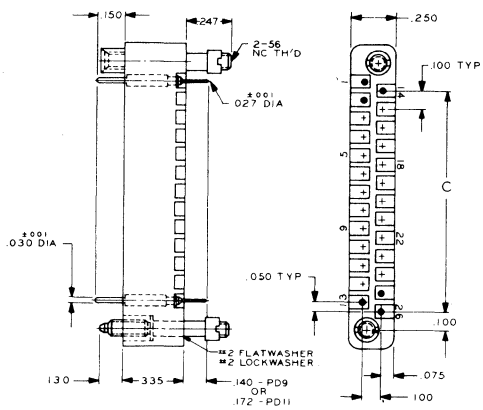
2 • ROW Connectors

Cable to Board or Panel

WTA-WTA



RECEPTACLE
EXAMPLE: WTA26SECJT



PLUG
EXAMPLE: WTA26PD9JL

TYPE OF CONTACTS

PLUG

PC	=	Pin, straight, solder cup
PD9	=	Pin, straight, dip solder, .140
PD11	=	Pin, straight, dip solder, .172
PF3	=	Pin, straight, flex-circuit, .047
PF6	=	Pin, straight, flex-circuit, .094
SEC	=	Socket, straight, solder cup, closed entry
SAC	=	Low force socket, straight, solder cup
SED9	=	Socket, straight, dip solder, .140
SAD9	=	Low force socket, straight, dip solder, .140
SED11	=	Socket, straight, dip solder, .172
SAD11	=	Low force socket, straight, dip solder, .172
SED15	=	Socket, straight, dip solder, .234
SAD15	=	Low force socket, straight, dip solder, .234
SF3	=	Socket, straight, flex-circuit, .047
SAF3	=	Low force socket, straight, flex-circuit, .047
SF6	=	Socket, straight, flex-circuit, .094
SAF6	=	Low force socket, straight, flex-circuit, .094

RECEPTACLE

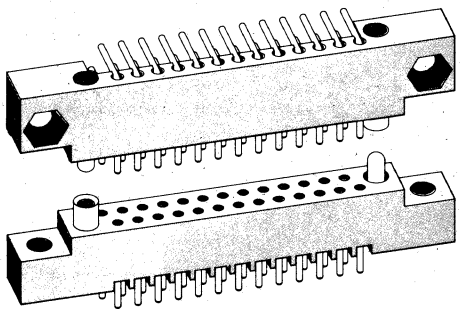
SEC	=	Socket, straight, solder cup, closed entry
SAC	=	Low force socket, straight, solder cup
SED9	=	Socket, straight, dip solder, .140
SAD9	=	Low force socket, straight, dip solder, .140
SED11	=	Socket, straight, dip solder, .172
SAD11	=	Low force socket, straight, dip solder, .172
SED15	=	Socket, straight, dip solder, .234
SAD15	=	Low force socket, straight, dip solder, .234
SF3	=	Socket, straight, flex-circuit, .047
SAF3	=	Low force socket, straight, flex-circuit, .047
SF6	=	Socket, straight, flex-circuit, .094
SAF6	=	Low force socket, straight, flex-circuit, .094
SW40	=	Socket, straight, Wire Wrap, .625
SAW40	=	Low force socket, straight, Wire Wrap, .625
PC	=	Pin, straight, solder cup
PD9	=	Pin, straight, dip solder, .140
PD11	=	Pin, straight, dip solder, .172
PF3	=	Pin, straight, flex-circuit, .047
PF6	=	Pin, straight, flex-circuit, .094
PW40	=	Pin, straight, Wire Wrap, .625

WTA-WTA DIMENSIONS

SIZE	A	B	C
10	.850	.650	.400
14	1.050	.850	.600
20	1.350	1.150	.900
24	1.550	1.350	1.100
26	1.650	1.450	1.200
30	1.850	1.650	1.400
36	2.150	1.950	1.700
40	2.350	2.150	1.900
44	2.550	2.350	2.100
50	2.850	2.650	2.400
54	3.050	2.850	2.600
56	3.150	2.950	2.700
60	3.350	3.150	2.900
66	3.650	3.450	3.200
70	3.850	3.650	3.400

* **WARNING:** When interchanging contact, position of male and female hardware is automatically reversed.

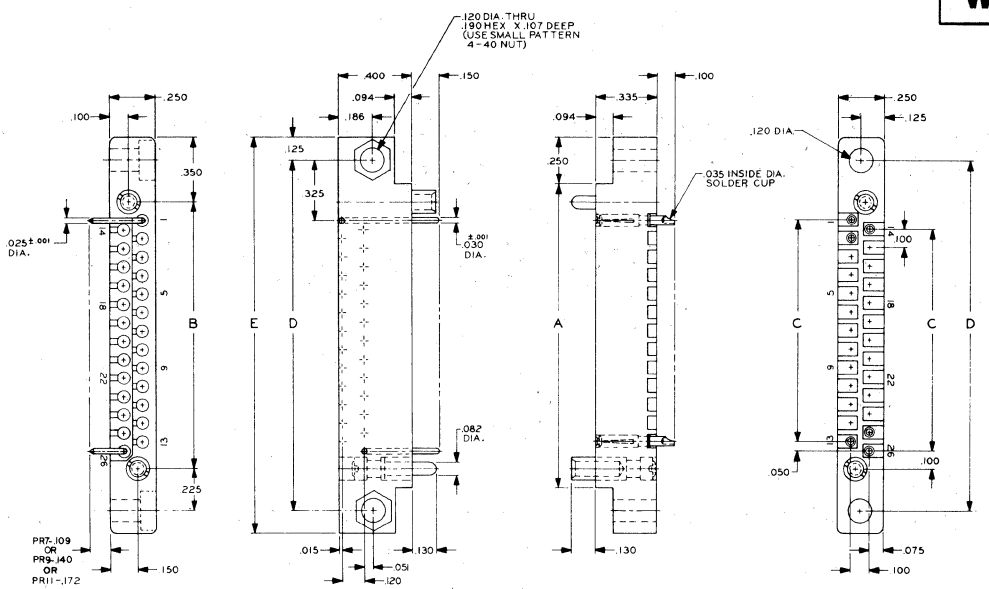
For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 214-931-3200 or FAX 214-931-9305



2 • ROW Connectors

PC Card to Chassis or Board

WTB-WTB



PLUG
EXAMPLE: WTB26PR9SY

RECEPTACLE
EXAMPLE: WTB26SECSY

TYPE OF CONTACTS

PLUG

PR7 = Pin, right-angle, dip solder, .109
PR9 = Pin, right-angle, dip solder, .140
PR11 = Pin, right-angle, dip solder, .172
PRW40 = Pin, right-angle, Wire Wrap, .625

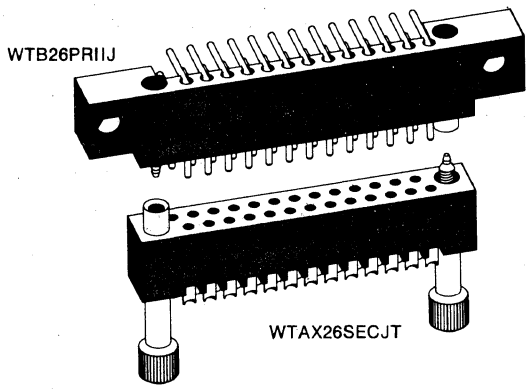
RECEPTACLE

SEC = Socket, straight, solder cup, closed entry
SAC = Low force socket, straight, solder cup
SED9 = Socket, straight, dip solder, .140
SAD9 = Low force socket, straight, dip solder, .140
SED11 = Socket, straight, dip solder, .172
SAD11 = Low force socket, straight, dip solder, .172
SED15 = Socket, straight, dip solder, .234
SAD15 = Low force socket, straight, dip solder, .234
SF3 = Socket, straight, flex-circuit, .047
SAF3 = Low force socket, straight, flex-circuit, .047
SF6 = Socket, straight, flex-circuit, .094
SAF6 = Low force socket, straight, flex-circuit, .094
SW40 = Socket, straight, Wire Wrap, .625
SAW40 = Low force socket, straight, Wire Wrap, .625

WTB-WTB DIMENSIONS

SIZE	A	B	C	D	E
10	.850	.650	.400	1.100	1.350
14	1.050	.850	.600	1.300	1.550
20	1.350	1.150	.900	1.600	1.850
24	1.550	1.350	1.100	1.800	2.050
26	1.650	1.450	1.200	1.900	2.150
30	1.850	1.650	1.400	2.100	2.350
36	2.150	1.950	1.700	2.400	2.650
40	2.350	2.150	1.900	2.600	2.850
44	2.550	2.350	2.100	2.800	3.050
50	2.850	2.650	2.400	3.100	3.350
54	3.050	2.850	2.600	3.300	3.550
56	3.150	2.950	2.700	3.400	3.650
60	3.350	3.150	2.900	3.600	3.850
66	3.650	3.450	3.200	3.900	4.150
70	3.850	3.650	3.400	4.100	4.350

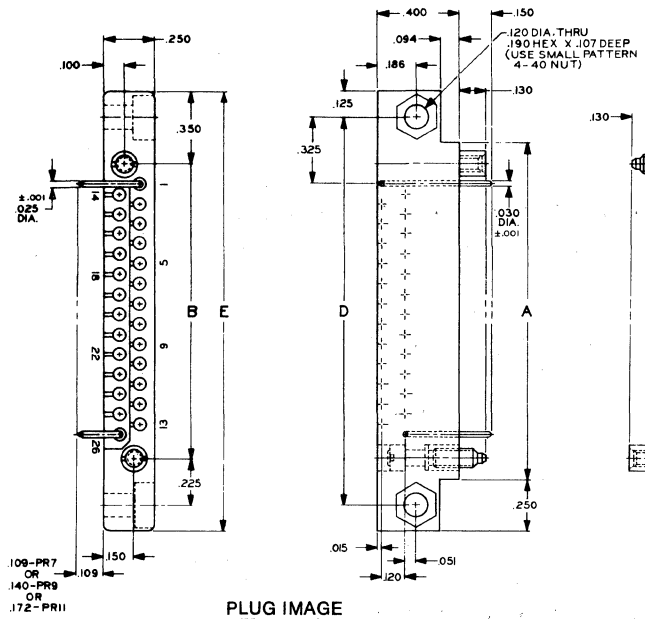
For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 214-931-3200 or FAX 214-931-9305



2 • ROW Connectors

Cable to Board

WTB-WTAX



PLUG IMAGE
EXAMPLE: WTB26PR7J

RECEPTACLE IMAGE
EXAMPLE: WTAX26SECJT

TYPE OF CONTACTS

PLUG

PR7 = Pin, right-angle, dip solder, .109
PR9 = Pin, right-angle, dip solder, .140
PR11 = Pin, right-angle, dip solder, .172
PRW40 = Pin, right-angle, Wire Wrap, .625

RECEPTACLE

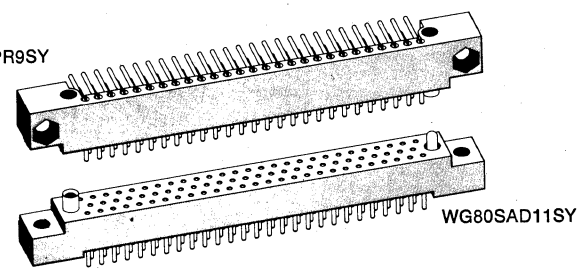
SEC = Socket, straight, solder cup, closed entry
SAC = Low force socket, straight, solder cup
SED9 = Socket, straight, dip solder, .140
SAD9 = Low force socket, straight, dip solder, .140
SED11 = Socket, straight, dip solder, .172
SAD11 = Low force socket, straight, dip solder, .172
SED15 = Socket, straight, dip solder, .234
SAD15 = Low force socket, straight, dip solder, .234
SF3 = Socket, straight, flex-circuit, .047
SAF3 = Low force socket, straight, flex-circuit, .047
SF6 = Socket, straight, flex-circuit, .094
SAF6 = Low force socket, straight, flex-circuit, .094

WTB-WTAX DIMENSIONS

SIZE	A	B	C	D	E
10	.850	.650	.400	1.100	1.350
14	1.050	.850	.600	1.300	1.550
20	1.350	1.150	.900	1.600	1.850
24	1.550	1.350	1.100	1.800	2.050
26	1.650	1.450	1.200	1.900	2.150
30	1.850	1.650	1.400	2.100	2.350
36	2.150	1.950	1.700	2.400	2.650
40	2.350	2.150	1.900	2.600	2.850
44	2.550	2.350	2.100	2.800	3.050
50	2.850	2.650	2.400	3.100	3.350
54	3.050	2.850	2.600	3.300	3.550
56	3.150	2.950	2.700	3.400	3.650
60	3.350	3.150	2.900	3.600	3.850
66	3.650	3.450	3.200	3.900	4.150
70	3.850	3.650	3.400	4.100	4.350

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 214-931-3200 or FAX 214-931-9305

WG80PR9SY

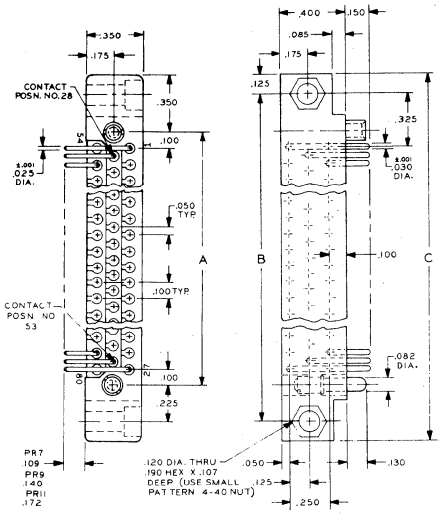


WG80SAD11SY

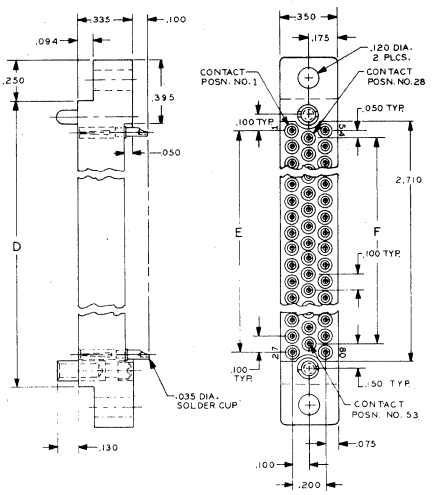
3 • ROW Connectors

PC Card to Board or Chassis

WG-WG (80)



PLUG
EXAMPLE: WG80PR9SY



RECEPTACLE
EXAMPLE: WG80SACSY

TYPE OF CONTACTS

PLUG

PR7 = Pin, right-angle, dip solder, .109
PR9 = Pin, right-angle, dip solder, .140
PR11 = Pin, right-angle, dip solder, .172
PRW34 = Pin, right-angle, Wire Wrap, .531

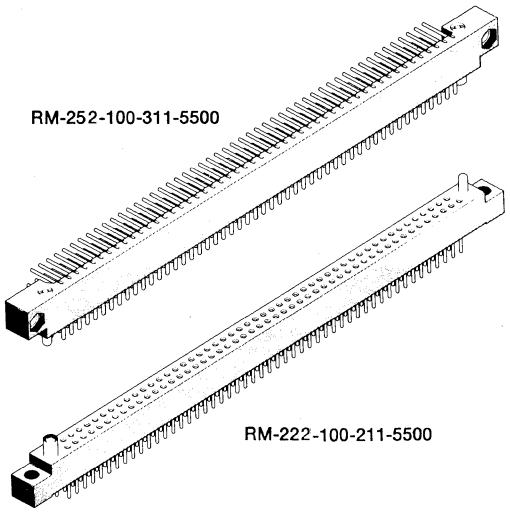
RECEPTACLE

SAC = Low force socket, straight, solder cup
SAD9 = Low force socket, straight, dip solder, .140
SAD11 = Low force socket, straight, dip solder, .172
SAD15 = Low force socket, straight, dip solder, .234
SAW40 = Low force socket, straight, Wire Wrap, .625

WG-WG (80) DIMENSIONS

SIZE	A	B	C	D	E	F
80	2.800	3.250	3.500	3.000	2.600	2.500

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 214-931-3200 or FAX 214-931-9305

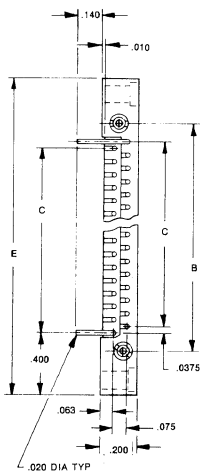


2 • ROW Connectors

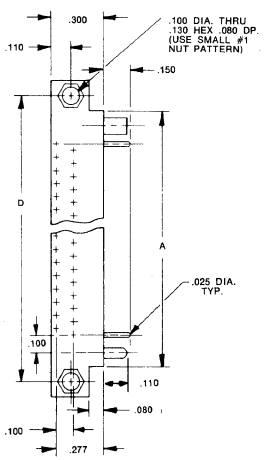
PC Card to Board or Chassis

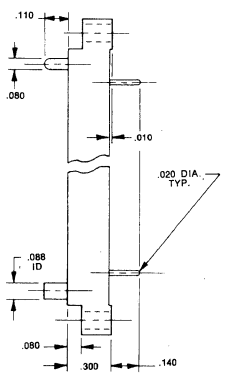
RM-2

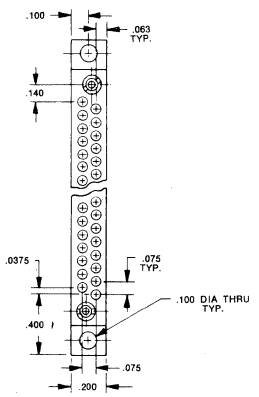
10 THRU 100 CONTACTS



PLUG
RM-252-100-321-5500



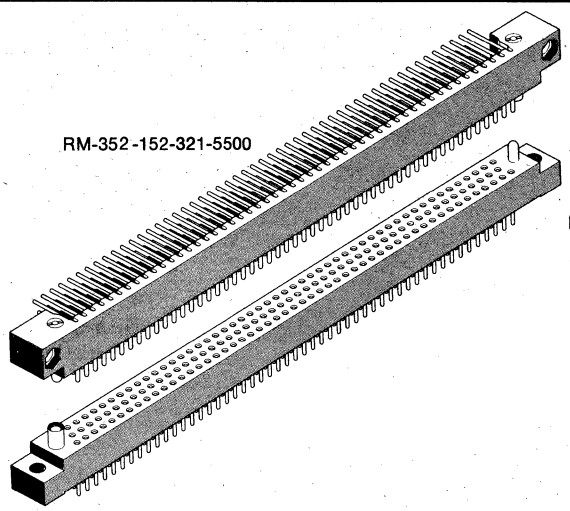




RECEPTACLE
RM-322-100-211-5500

NO. OF CONTACTS	A	B	C	D	E
10	.797	.617	.300	.967	1.137
20	1.172	.992	.675	1.342	1.512
30	1.547	1.367	1.050	1.717	1.887
40	1.922	1.742	1.425	2.092	2.262
50	2.297	2.117	1.800	2.467	2.637
60	2.672	2.492	2.175	2.842	3.012
70	3.047	2.687	2.550	3.217	3.387
80	3.422	3.242	2.925	3.592	3.762
90	3.797	3.617	3.300	3.967	4.137
100	4.172	3.992	3.675	4.342	4.512

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 214-931-3200 or FAX 214-931-9305

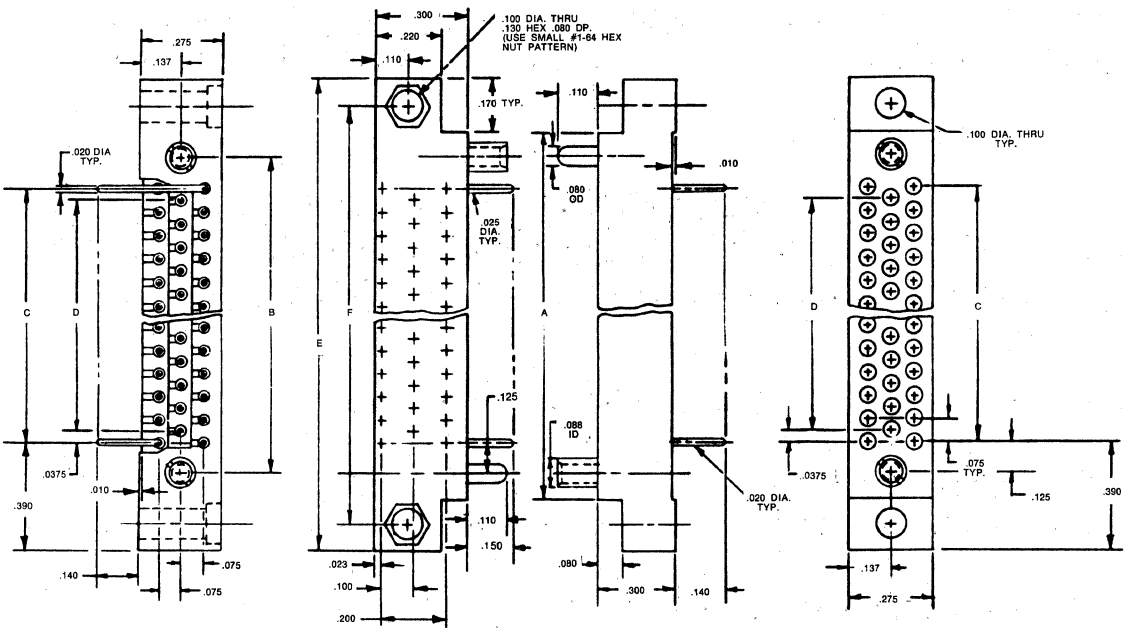


3 • ROW Connectors

PC Card to Board or Chassis

RM-3

152 CONTACTS
206 CONTACTS

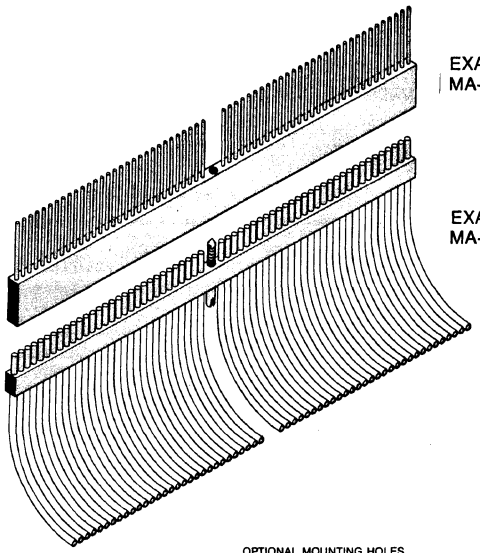


PLUG
RM-352-152-321-5500

RECEPTACLE
RM-322-152-311-5500

NO. OF CONTACTS	A	B	C	D	E	F
152	4.190	4.000	3.750	3.675	4.530	4.360
206	5.540	5.350	5.100	5.025	5.880	5.710

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 214-931-3200 or FAX 214-931-9305



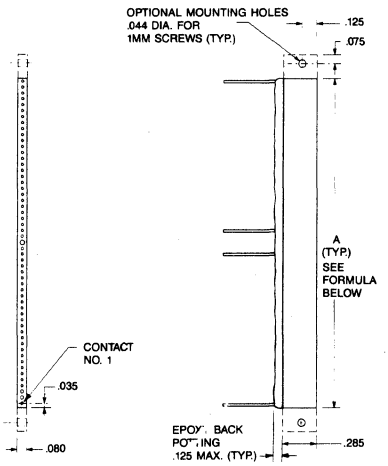
EXAMPLE: PLUG
MA-131-060-155-6900

EXAMPLE: RECEPTACLE
MA-141-060-261-72WS

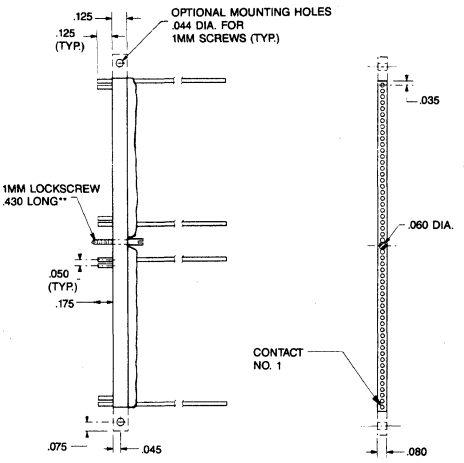
Strip Connectors

.050″ Microminiature

MA



PLUG



RECEPTACLE

NOTE: Lenghts over 2″ may require support to insure alignment.

TYPE OF CONTACTS
TERMINATIONS

Pin, straight, solder cup
Pin, straight, dip solder, .109″
Pin, straight, dip solder, .140″
Pin, straight, .500″ pigtails
Pin, straight, 1.000″ pigtails
Pin, straight, crimped wire
Pin, right-angle, dip solder, .109″
Pin, right-angle, dip solder, .140″

Socket, straight, solder cup
Socket, straight, dip solder, .109″
Socket, straight, dip solder, .140″
Socket, straight, .500″ pigtails
Socket, straight, 1.000″ pigtails
Socket, straight, crimped wire
Socket, right-angle, dip solder, .109″
Socket, right-angle, dip solder, .140″

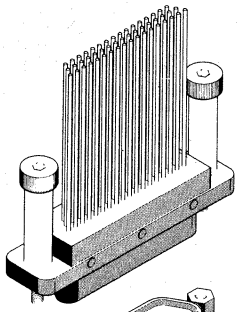
MA
DIMENSIONS

To determine connector length (Dim. "A"):

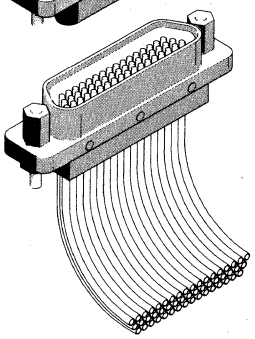
Multiply the number of contact cavities by .050″	″
Add fixed end lengths (constant)	.020″
Add .150″ for each mounting hole	″
Total Length*	″

NOTE:
* Maximum length is 6.020″. Maximum number of contacts must be reduced to accommodate hardware and mounting holes. Minimum length is .170″ (3 contact cavities).
** When locating one lockscrew, use the centermost available hole. Also, careful engagement is necessary to prevent damage to the plastic threads.

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 512-863-5585 or FAX 512-863-8259



Example Plug
MM-313-051-155-4200
(Metal)
MN-211-025-113-4300
(Plastic)



Example Receptacle
MM-323-051-261-22WS
(Metal)
MN-221-025-261-22WS
(Plastic)

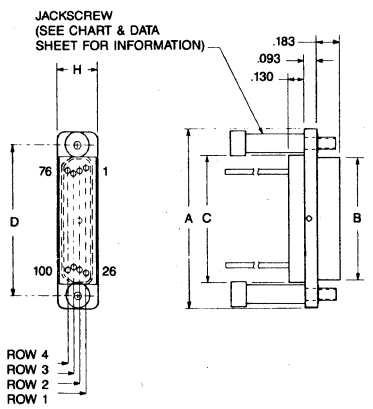
I/O Connectors

.050"
Rugged Metal

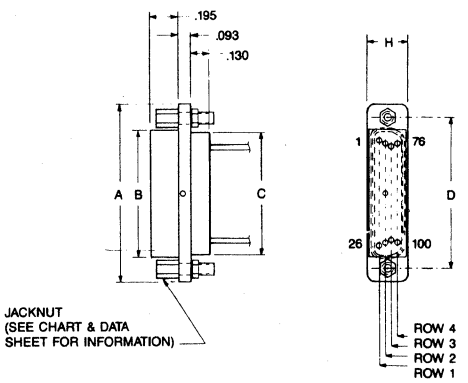
MM

.050
Rugged Plastic

MN



PLUG



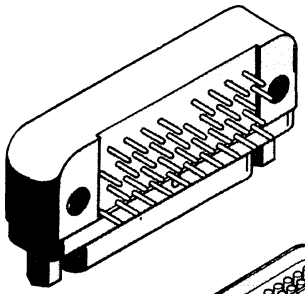
RECEPTACLE

DIMENSIONS

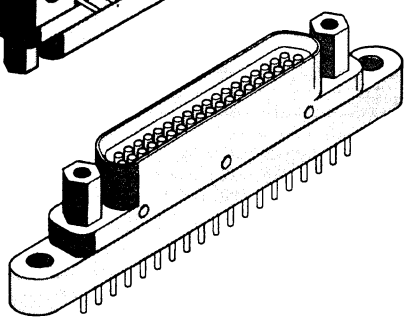
SIZES	CONTACT ROWS	A	B		C	D	H	JACKSCREW, JACKNUT SEE SHT. A-1
			PLUG MAX.	RECEPTACLE MAX.				
9	2	.775	.333	.400	.390	.565	.298	2-56 UNC THREAD
15		.925	.483	.550	.540	.715		
21		1.075	.633	.700	.690	.865		
25		1.175	.733	.800	.790	.965		
31		1.325	.883	.950	.940	1.115		
37		1.475	1.033	1.100	1.090	1.265		
51	3	1.425	.983	1.050	1.040	1.215	.341	
100	4	2.160	1.383	1.450	1.432	1.800	.384	4-40 UNC THREAD

Receptacle "B" dimension is "inside shroud" dimension.

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 512-863-5585 or FAX 512-863-8259



EXAMPLE: PLUG
MK-263-037-435-220S
(Metal)
ML-261-037-435-220S
(Plastic)



EXAMPLE: RECEPTACLE
MK-223-037-225-2200
(Metal)
ML-221-037-225-2200
(Plastic)

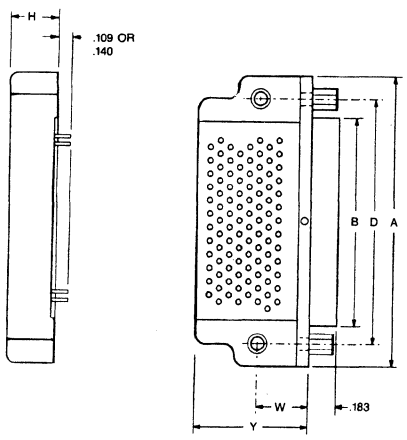
PC BOARD Mounted Connectors

.050″ Rugged Metal

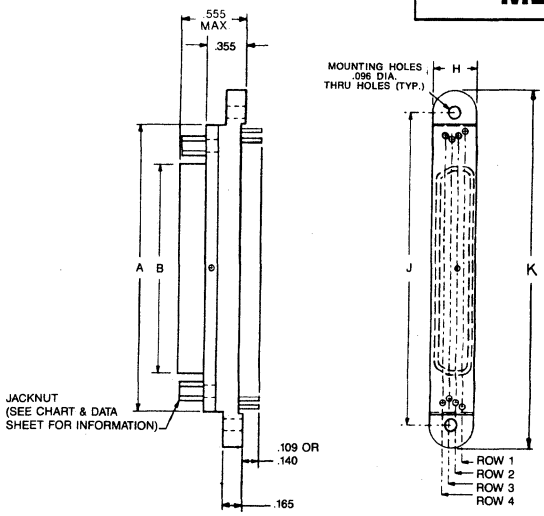
MK

.050 Rugged Plastic

ML



RIGHT ANGLE
PLUG



STRAIGHT
RECEPTACLE

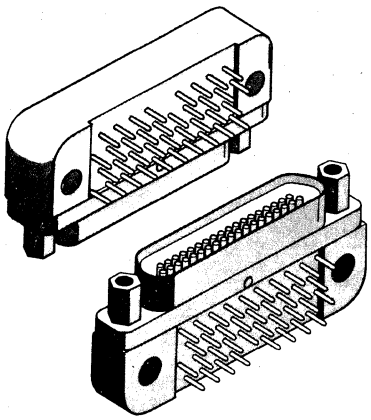
DIMENSIONS

SIZE	CONTACT ROWS	A	B PLUG MAX.	B RECEPTACLE MAX.	D	H	J	K	W	Y	FIXED JACKNUT
9		.775	.333	.400	.565		1.150	1.390			
15		.925	.483	.550	.715					.420	
21	2	1.075	.633	.700	.865	.298	1.450	1.690	.250		
25		1.175	.733	.800	.965		1.500	1.740			2-56 UNC THREAD
31		1.325	.833	.950	1.115		1.800	2.040		.520	
37		1.475	1.033	1.100	1.265		2.100	2.340			
51	3	1.425	.983	1.050	1.215	.342	2.000	2.270	.300	.650	
100	4	2.160	1.383	1.450	1.800	.384	2.800	3.240	.400	1.000	4-40 UNC THREAD

Receptacle "B" dimension is "inside shroud" dimension.

For types of hardware and other specific design requirements to meet specific applications, call
AirBorn Customer Service at 512-863-5585 or FAX 512-863-8259

EXAMPLE: PLUG
MS-253-037-325-220S
(Metal)
MR-251-037-325-220S
(Plastic)



EXAMPLE: RECEPTACLE
MS-263-037-435-220S
(Metal)
MR-261-037-435-220S
(Plastic)

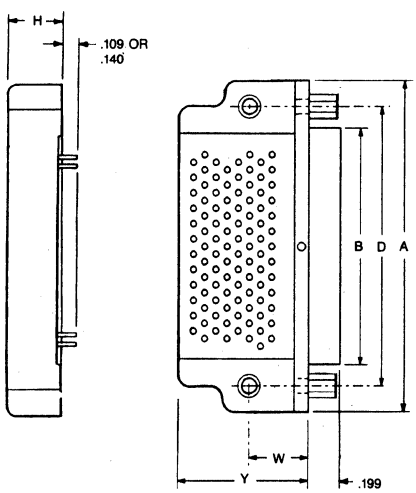
PC BOARD Mounted Connectors

.050″ Low Profile Metal

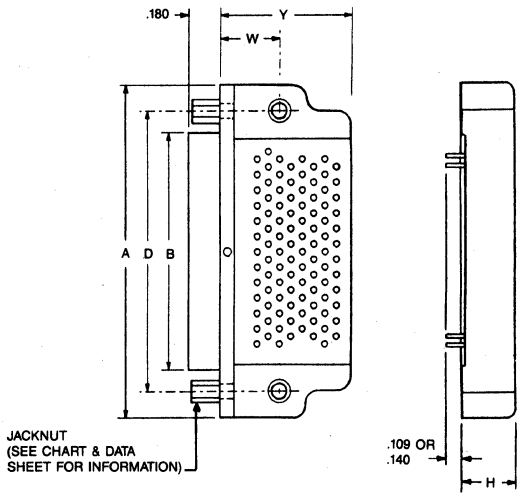
MS

.050 Low Profile Plastic

MR



RIGHT ANGLE PLUG



RIGHT ANGLE RECEPTACLE

DIMENSIONS

SIZE	CONTACT ROWS	A	B		D	H	W	Y	FIXED JACKNUT
			PLUG MAX.	RECEPTACLE MAX.					
9	2	.778	.291	.400	.565	.208	.250	.420	2-56 UNC THREAD
15		.928	.441	.550	.715				
21		1.078	.591	.700	.865				
25		1.178	.691	.800	.965				
31		1.328	.841	.950	1.115			.520	
37		1.478	.991	1.100	1.265				
51	3	1.428	.941	1.050	1.215	.250	.300	.650	

Receptacle "B" dimension is "inside shroud" dimension.

For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 512-863-5585 or FAX 512-863-8259

PLUG	RECEPTACLE
SERIES	
.050″ Rugged Metal I/O Connector .050″ Rugged Plastic I/O Connector	.050″ Rugged Metal I/O Connector .050″ Rugged Plastic I/O Connector
BODY	
2-Row 3-Row 4-Row	2-Row 3-Row 4-Row
BODY STYLE: Plug, straight, with ears	BODY STYLE: Receptacle, straight, with ears
BODY MATERIAL: Polyphenylene sulfide, with electroless nickel shell Polyphenylene sulfide, with electrodeposited cadmium shell Polyphenylene sulfide, with hard anodized, black shell Polyphenylene sulfide, with zinc shell Polyphenylene sulfide	BODY MATERIAL: Polyphenylene sulfide, with electroless nickel shell Polyphenylene sulfide, with electrodeposited cadmium shell Polyphenylene sulfide, with hard anodized, black shell Polyphenylene sulfide, with zinc shell Polyphenylene sulfide
SIZE	
No. of contacts: 9, 15, 21, 25, 31, or 37 (2-rows) 51 contacts (3-rows) 100 contacts (4-rows) Other sizes available; check with factory.	No. of contacts: 9, 15, 21, 25, 31, or 37 (2-rows) 51 contacts (3-rows) 100 contacts (4-rows)
CONTACTS	
TYPE CONTACTS/TERMINATIONS: Pin, straight, solder cup Pin, straight, .500″ pigtails Pin, straight, 1.000″ pigtails Pin, straight, crimped wire	TYPE CONTACTS/TERMINATIONS: Socket, straight, solder cup Socket, straight. 500″ pigtails Socket, straight, 1.000″ pigtails Socket, straight, crimped wire
PLATING OPTIONS: 50 μ″ Au contacts 30 μ″ Au contacts 50 μ″ Au contacts; 10 μ″ Au terminations 30 μ″ Au contacts; 10 μ″ Au terminations 50 μ″ Au contacts; 100 μ″ Sn terminations 30 μ″ Au contacts; 100 μ″ Sn terminations	PLATING OPTIONS: 50 μ″ Au contacts 30 μ″ Au contacts 50 μ″ Au contacts; 10 μ″ Au terminations 30 μ″ Au contacts; 10 μ″ Au terminations 50 μ″ Au contacts; 100 μ″ Sn terminations 30 μ″ Au contacts; 100 μ″ Sn terminations
HARDWARE	
STYLE OF HARDWARE: None Two fixed jacknut assemblies Two turning jackscrews, Allen head, retaining ring Two long turning jackscrews, Allen head, retaining ring Two turning jackscrews, slot head, retaining ring Two long turning jackscrews, slot head, retaining ring	STYLE OF HARDWARE: None Two fixed jacknut assemblies Two turning jackscrews, Allen head, retaining ring Two long turning jackscrews, Allen head, retaining ring Two turning jackscrews, slot head, retaining ring Two long turning jackscrews, slot head, retaining ring
NOTE: When ordering by MIL number, hardware comes unassembled.	
POLARIZATION/WIRING: NONE For wiring codes, see section A	POLARIZATION/WIRING: NONE For wiring codes, see section A

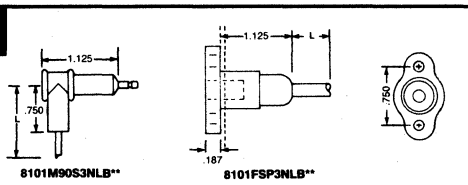
For types of hardware and other specific design requirements to meet specific applications, call AirBorn Customer Service at 512-863-5585 or TWX 510-601-5238.

CUSTOM • STANDARD • CUSTOM • STANDARD

ALDEN

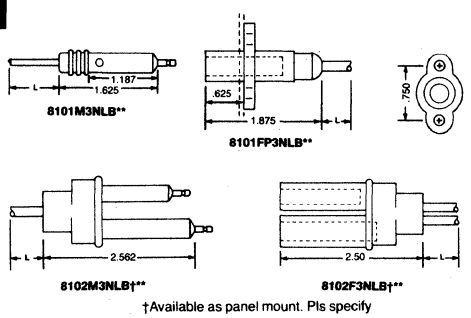
HIGH VOLTAGE CONNECTIONS 508-583-0160

5 KVDC



- Withstand voltage 15 KVDC
- Molded in 94V-0 flame retardant polypropylene
- 30 KVDC UL/CSA listed wire (** specifies length)
- Molded directly to wire for optimum performance
- Other styles and custom modifications available, use our FAXBACK Service.

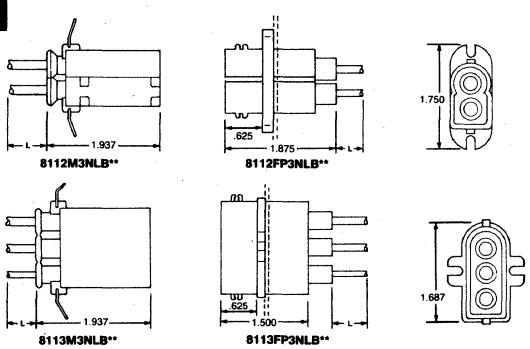
15 KVDC



†Available as panel mount. Pls specify

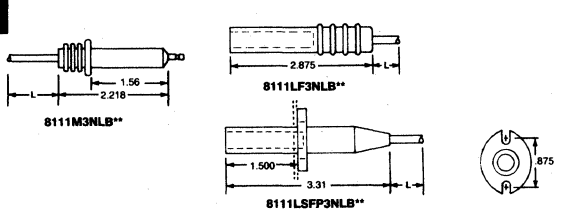
- Withstand voltage to 24 KVDC
- Molded in 94V-0 flame retardant polypropylene
- 30 KVDC UL/CSA listed wire (** specifies length)
- Molded directly to wire for optimum performance
- Other styles and custom modifications available, use our FAXBACK Service.

20 KVDC



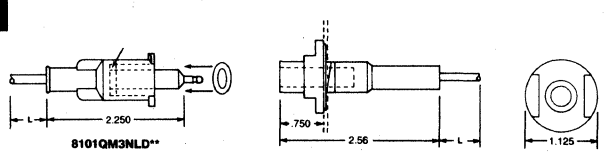
- Polarized 2 and 3 circuit connectors
- Withstand voltage 32 KVDC
- Molded in UL 94V-0 flame retardant polypropylene
- 30 KVDC UL/CSA listed wire (** specifies length)
- Molded directly to wire for optimum performance
- Locking rings for added retention
- Custom modifications available, use our FAXBACK Service.

25 KVDC

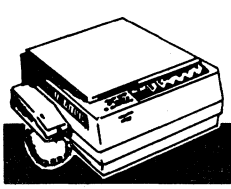


- Withstand voltage 40 KVDC
- Molded in UL 94V-0 flame retardant polypropylene
- 30 KVDC UL/CSA listed wire (** specifies length)
- Molded directly to wire for optimum performance
- Other styles and custom modifications available, use our FAXBACK Service.

35 KVDC



- Twist-locking with moisture resistant seal
- Withstand voltage 48 KVDC
- 40 KVDC UL/CSA listed wire (** specifies length)
- Molded directly to wire for optimum performance
- Other wires and custom modifications available, use our FAXBACK Service.



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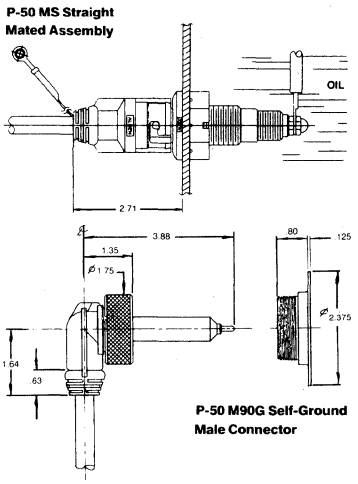
ALDEN

HIGH VOLTAGE CONNECTIONS 508-583-0160

HIGH VOLTAGE DETACHABLE, ENVIRONMENTALLY SEALED FEED-THRUS THE P-50 SERIES



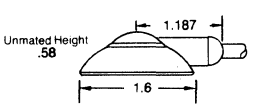
Alden Products' P-50 Connector Series is designed for use with high voltage electronic equipment cooled or insulated by dielectric liquids. The easy-to-install panel mount receptacle provides a fluid tight seal, making it an excellent feed through for oil filled enclosures.

SPECIFICATIONS

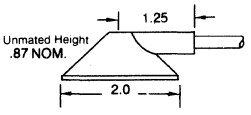
- **Electrical**
  - Working Voltage.....to 60 KVDC
  - Max. Current .....20 amps
- **Environmental**
  - Max. Temperature.....150°C
  - Receptacle Resistant to ....Transformer Oil, Freon 113 (TF), Freon 11
  - Flammability.....UL 94V-0
- **Mechanical**
  - Insulator Material .....Polyester Resin
  - Wire Insulation.....Silicone Rubber
  - Shielding.....Braided Tinned Copper (85% Coverage)
  - Conductor .....12 AWG (19/25)
  - Cable O.D. (over cover).....430" nom.

P-50 Cable Assemblies are available from the factory pre-terminated at one or both ends with a P-50MS or a P-50M90G plug. MS style is a straight plug with pigtail. M90G style is a right-angle plug with self-grounding nut.

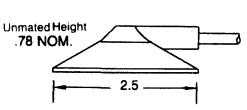
CRT ANODE CONNECTORS THE 3228 SERIES



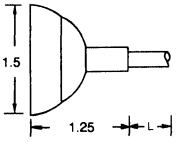
3228RA-2
- Operating voltages up to 30 KVDC
- Insulation material: silicone rubber UL94V-1
- Wire: 30 KVDC 18 AWG Silicone Rubber
- Fits JEDEC anode style J1-21, J1-22, J1-30



3228RA-3
- Operating voltages up to 30 KVDC
- Insulation material: silicone rubber UL94V-0
- Wire: 30 KVDC 22 AWG Cross Linked PVC
- Fits JEDEC anode style J1-21

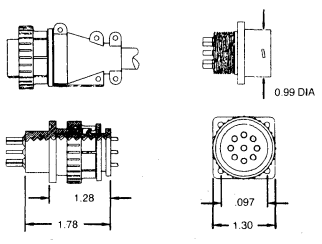


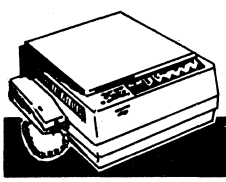
3228RA-4
- Operating voltages up to 40 KVDC
- Insulation material: thermoplastic rubber UL94V-0
- Wire: 40 KVDC 22 AWG Cross Linked PVC
- Fits JEDEC anode style J1-21



3228A
- Operating voltages up to 30 KVDC
- Insulation material: silicone rubber UL94V-1
- Wire: 30 KVDC 22 AWG Cross Linked PVC
- Fits JEDEC anode style J1-21

CIRCULAR SHELL CONNECTORS THE 9000 SERIES





Alden's 9000 series circular shell connectors represent a versatile new line of multi-circuit, environmental interconnects. The 9000 series' unique polyester resin housing offers many of the high performance features associated with exotic metal shell and glass hermetic circulars in a more cost effective package.

FEATURES
- Twist locking collar
- Oil immersable panel mount options
- Environmental sealing options
- Custom pin configurations available

Electrical options include filtering and shielding as well as captivation of passive electronic components on a custom basis.

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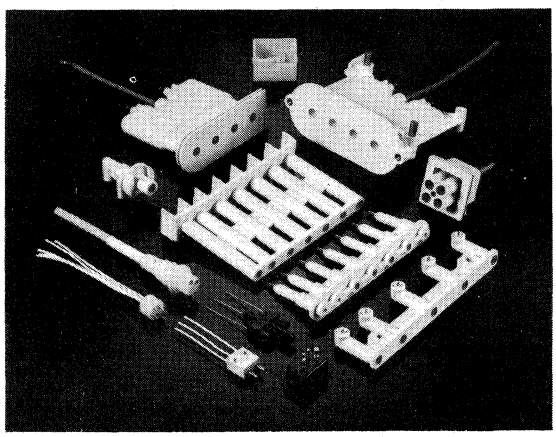
HIGH VOLTAGE CONNECTIONS 508-583-0160

IF YOU DON'T SEE IT – WE CAN MAKE IT



We Can Get You from Prototype to Production — On-time and Under Budget.

Alden has been meeting the custom interconnect requirements for business, medical, military, and industrial applications since 1929. We've designed and manufactured a range of products, such as nanovolt torpedo guidance connectors, 125KVDC X-ray connectors, molded electronic housings, completely encapsulated circuits — everything from simple plastic hardware to entire electro-mechanical systems.

No one knows insert molding and high voltage technology like Alden. We have everything you need to take you from design to production in-house.

CAPABILITIES

Design
CAD/CAM analysis and modeling
Tool path creation for quick changes

Prototyping
Test market, test applications, low volume production

Tooling
Single and multi-cavity molds to meet customer volume requirements — high tool integrity

Molding
A broad range of thermoset, thermoplastic, or elastomeric compounds is available — most are UL listed

Assembly
Complete, automated assembly using SPC controls — finishing, welding, plating, and mechanical assembly

TECHNOLOGIES

Prototypes
First piece for physical evaluation with minimal tooling
Fast delivery

Liquid Resin Casting
Cast epoxies, urethanes, silicones to represent thermoset, thermoplastic, or elastomeric materials

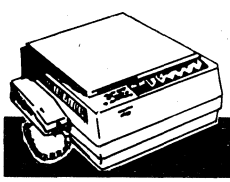
Cast and Molded Inserts
For electrical components, mechanical devices, and mounting hardware

Encapsulated Circuits
Combine electronic, mechanical and cable components in one mold

Custom Inserts
Work with your design specifications

Cable and Electro-Mechanical Assemblies
Soldering, hot-stamping, heat-staking, ultrasonic welding, mass cable preparation, termination , and harnessing

Alden from start to finish — for defect free parts.



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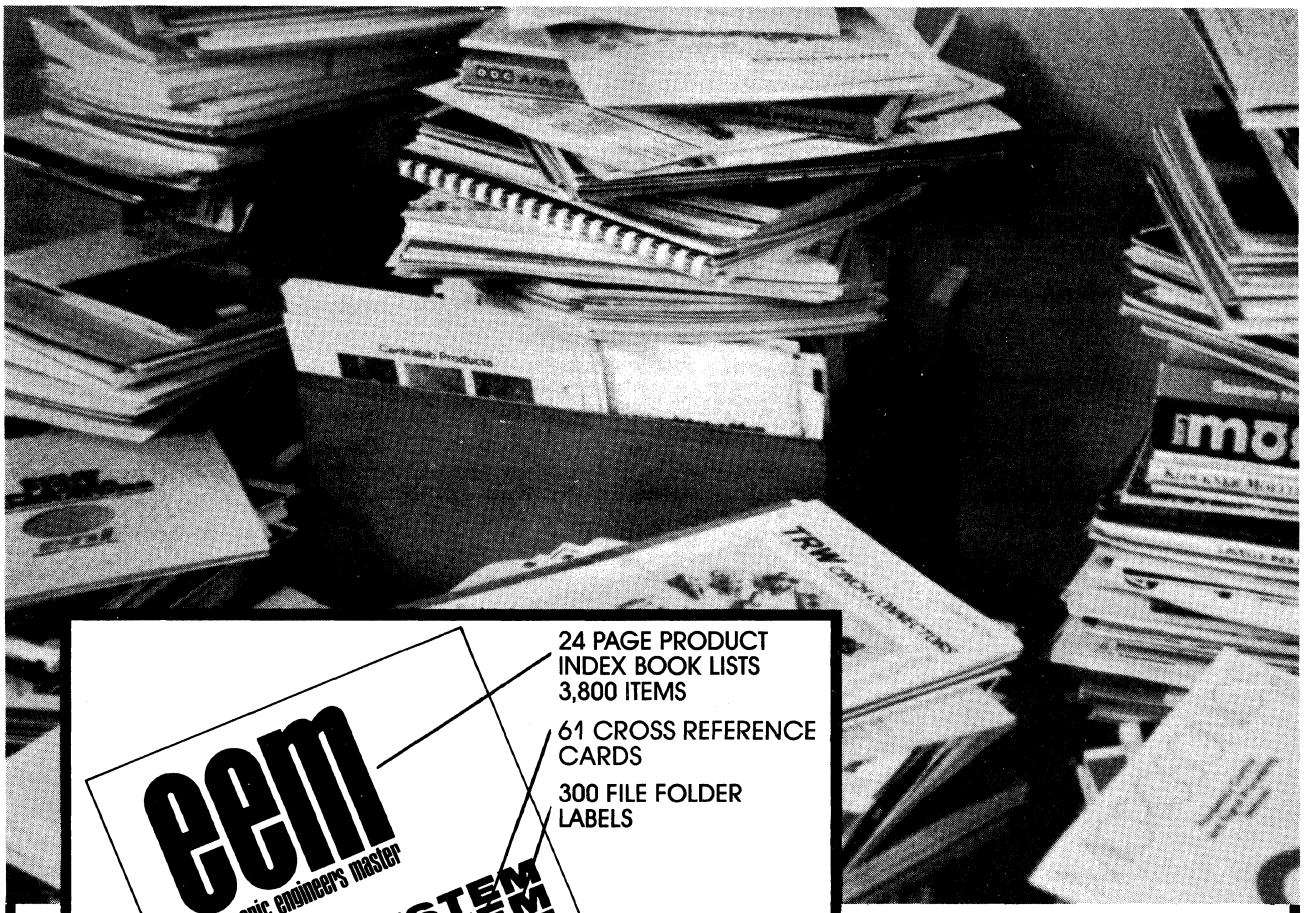

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EEM FILE SYSTEM,
645 stewart ave., garden city, ny 11530

Wiring Management Solutions for Virtually any Electrical or Electronic System from Wire Bundling to Printed Circuit Board Accessories

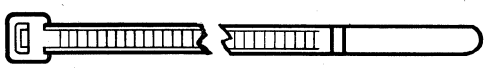
All-States has been manufacturing cable ties since 1968. We also design and manufacture our own production tools and products in our Chicago facilities. Our new management team has instituted an aggressive new product development program to meet changing needs in the electrical and electronic industries.

Materials

All-States Products are available in a variety of engineering injection molded plastics. Nylon 66 is our standard material. UV stabilized and heat-stabilized nylons are available as options. Fire retardant grades of nylon and polypropylene are also available. Products can also be produced in other various grades of polypropylene and polyethylene. High temperature applications can be met through use of Tefzel molded products.

ALL-STATES®
1801 W. Foster Ave.,
Chicago, IL 60640-1097
(312) 728-0525, FAX (312) 728-6410 Telex 317027

RT and RTH Series Single Loop Cable Ties



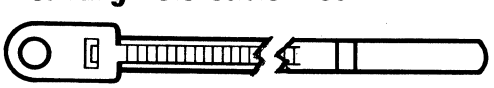
RT Series single loop cable ties are available for securing bundle diameters from 1/16″ through 4″. Heavy-duty RTH Series ties secure bundles with diameters of 3/16″ through 14″. The one-piece injection-molded construction provides maximum strength and durability. Closely spaced positive-locking teeth allow secure and finely adjustable bundle fastening. Both series also feature smooth, round edges that protect insulation and hands from cutting. For easy and fast installation around smaller bundles, the RT Series has a bent tip design with sure grip ridges. The RTH Series has a straight tip design with sure grip ridges.

RT and RTH Specifing Information

Model Number	Min. Loop Tensile Strength Lbs.(kg)	Max. Bundle Dia. In. (mm)	Approx. Length In. (mm)	Approx. Strap Width In. (mm)	Approx. Strap Thickness In. (mm)	Cross-Section Series[5]	Mil Std 3367
RT-350	18 (8)	3/4 (19)	3 3/4 (95)	.090 (2.3)	.045 (1.1)	M	—4
RT-360	18 (8)	1 1/2 (38)	6 (152)	.090 (2.3)	.045 (1.1)	M	
RT-377	18 (8)	2 (50)	7 3/4 (196)	.090 (2.3)	.045 (1.1)	M	
RT-400	30 (13)	1 (25)	5 (127)	.115 (2.9)	.045 (1.1)	C	
RT-550	40 (18)	1 1/4 (31)	6 (152)	.135 (3.4)	.050 (1.2)	I	—5
RT-508	40 (18)	2 (50)	8 1/4 (209)	.135 (3.4)	.050 (1.2)	I	
RT-511	40 (18)	3 (76)	11 1/2 (292)	.135 (3.4)	.050 (1.2)	I	
RT-514	40 (18)	4 (101)	14 1/2 (368)	.135 (3.4)	.050 (1.2)	I	
RT-675	50 (22)	1 3/4 (44)	7 1/4 (184)	.190 (4.8)	.055 (1.3)	S	—1
RT-1100	50 (22)	3 (76)	11 1/4 (285)	.190 (4.8)	.055 (1.4)	S	—7
RT-1400	50 (22)	4 (101)	14 1/4 (361)	.190 (4.8)	.055 (1.4)	S	—2
RTH-800	120 (54)	2 (50)	8 (203)	.310 (7.8)	.083 (2.1)	H	
RTH-1400	120 (54)	4 (101)	14 1/2 (368)	.310 (7.8)	.083 (2.1)	H	—3
RTH-1700	120 (54)	5 (127)	17 1/2 (444)	.310 (7.8)	.083 (2.1)	H	
RTH-2100	120 (54)	6 (152)	21 1/2 (546)	.310 (7.8)	.083 (2.1)	H	
RTH-2800	120 (54)	8 (203)	28 (711)	.310 (7.8)	.083 (2.1)	H	—6
RTH-3200	175 (78)	10 (254)	33 (838)	.360 (9.1)	.083 (2.1)	H	
RTH-4400	175 (78)	14 (355)	45 1/2 (1155)	.360 (9.1)	.083 (2.1)	H	

[5]Cross-Section Series (MIL Strap Identification Code): M = Miniature; C = Compact (non-MIL); I = Intermediate; S = Standard; H = Heavy.

RTM and RTHM Series Mounting Hole Cable Ties



RTM and RTHM Series ties have a molded-in screw hole for mounting bundles in almost any position to virtually any surface. RTM Series ties can secure bundle diameters from 1/16″ through 4″ and feature a bent tip design with sure grip ridges for easy insertion around smaller bundles. RTHM Series ties are extra strong and secure bundle diameters of 3/16″ through 8″ and feature a straight tip desigh with sure grip ridges. Both series have positive-locking teeth and one-piece molded construction for maximum strength and durability.

RTM and RTHM Specifing Information

Model Number	Min. Loop Tensile Strength Lbs.(Kg.)	Max. Bundle Diameter In. (mm)	Approx. Length In. (mm)	Approx. Strap Width In. (mm)	Approx. Strap Thickness In. (mm)	Cross-Section Series[5]	Screw Hole Size (mm)
RTM-400	30 (13)	1 (25)	5 1/2 (139)	.115 (2.9)	.045 (1.1)	C	No. 4 (2.8)
RTM-408	30 (13)	2 (50)	8 1/2 (215)	.115 (2.9)	.045 (1.1)	C	No. 4 (2.8)
RTM-550	40 (18)	1 1/4 (31)	6 1/2 (165)	.135 (3.4)	.050 (1.2)	I	No. 8 (4.1)
RTM-675	50 (22)	1 3/4 (44)	8 (203)	.190 (4.8)	.055 (1.3)	S	No. 10 (4.8)
RTM-1100	50 (22)	3 (76)	12 (304)	.190 (4.8)	.055 (1.3)	S	No. 10 (4.8)
RTM-1400	50 (22)	4 (101)	15 (381)	.190 (4.8)	.055 (1.3)	S	No. 10 (4.8)
RTHM-1400	120 (54)	4 (101)	15 (381)	.310 (7.8)	.083 (2.1)	H	1/4″ (6.3)
RTHM-2100	120 (54)	6 (152)	22 (558)	.310 (7.8)	.083 (2.1)	H	1/4″ (6.3)
RTHM-2800	120 (54)	8 (203)	29 (736)	.310 (7.8)	.083 (2.1)	H	1/4″ (6.3)

[5]Cross-Section Series (MIL Strap Identification Code): C = Compact (non-MIL); I = Intermediate; S = Standard; H = Heavy.

88211

RTPM Series Push-Mount Cable Ties

RTPM Series ties will snap easily into a 1/4" hole of any panel or chassis up to 1/8" thick and secure bundle diameters of 1/16" through 4". Centering ears and locking barbs prevent release during stress or vibration and spring-arm thickness compensators keep bundle tightly anchored to panel or chassis. One-piece construction and positive-locking teeth assure accurate and secure bundling. Smooth, round edges protect insulation and hands from cutting. Bent tip design allows easy installation.

RTID, RTIDE, & RTIDI Series Identification Cable Ties

All the features and strength of our RT Series cable ties combined with a textured plate allows permanent identification of bundles using All-States' nylon-penetrating marking pens.

RTID Series ID Cable Ties are standard cross-section ties designed for bundle diameters of 3/8" through 4". The ID plate runs perpendicular to the bundle inside the head.

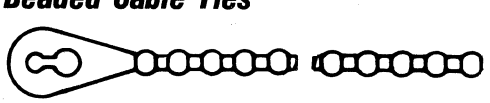
RTIDE Series ID Cable Ties are miniature cross-section ties designed for bundle diameters of 1/16" through 3/4". The ID plate runs perpendicular to the bundle outside the head. Ideal for applications requiring added visibility.

RTIDI Series ID Cable Ties are miniature cross-section ties designed for bundle diameters of 1/4" through 3/4". The ID plate runs parallel to the bundle inside the head.

RTDL Series Double Loop Cable Ties

RTDL ties were designed for dual bundle applications and secure combined maximum bundle diameters of 1-1/2" through 4". Its two way locking head can lock around one bundle like a single loop tie, and also lock around another bundle in a figure eight configuration. The head acts as a spacer between the two bundles. The second loop can even be left unused for future use. One-piece molded construction adds maximum strength. Bent tip design allows easy installation.

Beaded Cable Ties



Beaded cable ties secure bundle diameters of 3/16" through 5". The positive-locking key head secures quickly and tightly yet can be released for almost indefinite reuse, making them especially useful where bundling requirements may change. The smooth round beads do not damage insulation and allow uniform adjustment.

RTPM Specifing Information

Model Number	Min. Loop Tensile Strength Lbs. (Kg.)	Max. Bundle Diameter In. (mm)	Approx. Length In. (mm)	Approx. Strap Width In. (mm)	Approx. Strap Thickness In. (mm)	Cross-Section Series[5]	Panel Hole Size In. (mm)
RTPM-675	50 (22)	1 3/4 (44)	8 (203)	.190 (4.8)	.055 (1.4)	S	1/4" (6.3)
RTPM-1100	50 (22)	3 (76)	12 (305)	.190 (4.8)	.055 (1.4)	S	1/4" (6.3)
RTPM-1400	50 (22)	4 (101)	15 (381)	.190 (4.8)	.055 (1.4)	S	1/4" (6.3)

[5]Cross-Section Series (MIL Strap Identification Code): S = Standard.

RTID, RTIDE & RTIDI Specifing Information

Model Number	Min. Loop Tensile Strength Lbs.(Kg.)	Max. Bundle Dia. In. (mm)	Approx. Strap Length In. (mm)	Approx. Strap Width In. (mm)	Approx. Thickness In. (mm)	Cross-Section Series[6]	Mil Std 3368
RTID-675	50 (22)	1 3/4 (44)	7 1/2 (190)	.187 (4.7)	.055 (1.3)	S	—1
RTID-1100	50 (22)	3 (76)	11 1/2 (292)	.187 (4.7)	.055 (1.3)	S	
RTID-1400	50 (22)	4 (101)	14 1/2 (368)	.187 (4.7)	.055 (1.4)	S	—2
RTIDE-350	18 (8)	3/4 (19)	3 3/4 (95)	.092 (2.3)	.045 (1.1)	M	
RTIDI-350	18 (8)	3/4 (19)	3 3/4 (95)	.092 (2.3)	.045 (1.1)	M	—5

[6]Cross-Section Series (MIL Strap Identification Code): M = Miniature, S = Standard.

RTDL Specifing Information

Model Number	Min. Loop Tensile Strength Lbs.(Kg.)	Max. Bundle Dia. In. (mm)	Approx. Strap Length In. (mm)	Approx. Strap Width In. (mm)	Approx. Thickness In. (mm)	Cross-Section Series[6]	Mil Std 3368
RTDL-675	50 (22)	1 1/2 (38)[5]	7 3/4 (196)	.187 (4.7)	.055 (1.3)	S	
RTDL-1100	50 (22)	3 (76)[5]	11 3/4 (298)	.187 (4.7)	.055 (1.3)	S	
RTDL-1400	50 (22)	4 (101)[5]	14 3/4 (374)	.187 (4.7)	.055 (1.3)	S	

[5]Maximum bundle diameter is that of the combined two bundles.
[6]Cross-Section Series (MIL Strap Identification Code): S = Standard.

Beaded Cable Tie Specifing Information

Model Number	Min. Loop Tensile Strength Lbs. (Kg.)	Max. Bundle Dia. In. (mm)	Approx. Length In. (mm)	Bead Dia. In. (mm)	Bead Spacing In. (mm)
Nylon					
BT-4N	40 (18)	1 1/8 (28)	4 1/4 (107)	3/32 (2.3)	1/8 (3.1)
BT-5N	40 (18)	1 3/8 (34)	5 (127)	3/32 (2.3)	1/8 (3.1)
BT-6N	75 (33)	1 7/8 (47)	6 3/4 (171)	1/8 (3.1)	1/4 (6.3)
BT-8N	75 (33)	2 1/2 (63)	9 (228)	1/8 (3.1)	1/4 (6.3)
BT-10N	75 (33)	3 (76)	11 (279)	1/8 (3.1)	1/4 (6.3)
BT-14N	75 (33)	4 (101)	15 (381)	1/8 (3.1)	1/4 (6.3)
BT-17N	75 (33)	5 (127)	18 (457)	1/8 (3.1)	1/4 (6.3)
Polyethylene					
BT-4PE	10 (4.5)	1 1/8 (28)	4 1/4 (107)	3/32 (2.3)	1/8 (3.2)
BT-5PE	10 (4.5)	1 3/8 (34)	5 (127)	3/32 (2.3)	1/8 (3.2)
BT-6PE	18 (8.1)	1 7/8 (47)	6 3/4 (171)	1/8 (3.1)	1/4 (6.3)
BT-8PE	18 (8.1)	2 1/2 (63)	9 (228)	1/8 (3.1)	1/4 (6.3)
BT-10PE	18 (8.1)	3 (76)	11 (279)	1/8 (3.1)	1/4 (6.3)
BT-14PE	18 (8.1)	4 (101)	15 (381)	1/8 (3.1)	1/4 (6.3)
BT-17PE	18 (8.1)	5 (127)	18 (457)	1/8 (3.1)	1/4 (6.3)

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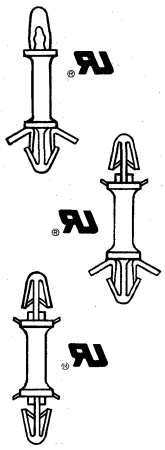
88211

Printed Circuit Board Accessories

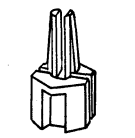


T-Series Tension-Retaining Push-Mount Supports/Spacers* are designed for chassis-to-board applications. The PC board is firmly retained by the non-locking end of the support. Spacing heights from 3/16″ through 1-3/8″.

L-Series Locking Push-Mount Supports/ Spacers* are designed for chassis-to-board applications. The board locking end, with barb-strengthening ribs, anchors the board securely. Both ends lock to resist release from vibration. Spacing heights from 3/16″ through 1-3/8″.

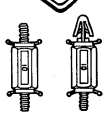
DL-Series Double-Locking Push-Mount Supports/Spacers* are designed for board-to-board applications. Locking barbs on both ends hold board tightly in any orientation even under vibration or temperature changes. Spacing heights from 5/32″ through 1-11/32″.

**Snap firmly into any 3/16″ chassis hole or 5/32″ board hole.*

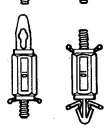


SMS-Series Screw-Mount Supports/ Spacers are available for chassis-to-board and board-to-board applications and come in spacing heights of 1/4″ through 1/2″. They use self-tapping screws or pins which lock into boards up to .062″ thick.

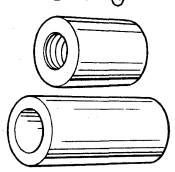
APA Series Hole Adapters can be used where drilled holes are undesirable. The adhesive-backed adapter acts as a base mounting hole.



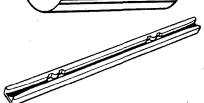
Hex Shaped Supports/Spacers are available in push- and screw-mount configurations for board-to-board or chassis-to-board applications. 40 models available in 10 lengths from 1/4″ through 1-1/4″ in each of four styles.



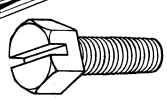
Circuit Board Threaded Spacers for separating PC boards by 1/4″ through 3/4″ are available in two thread sizes and eight models.



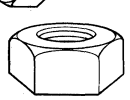
Circuit Board Unthreaded Spacers for separating PC boards by 1/8″ through 1″ are available in two ID sizes and 17 models.



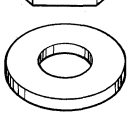
Printed Circuit Board Guides for chassis mounting allow easy PC board insertion and removal. Detents hold boards securely. Available in 4 lengths.



Slotted/Hex Head Machine Screw tightens with screwdriver or wrench. Durable nylon, available in five thread sizes in 31 models covering 10 lengths from 1/4″ through 1-1/2″.



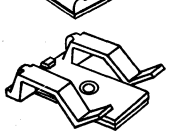
Hex Machine-Screw Nylon Nut in thread sizes 4-40, 6-32, 8-32, 10-32 and 1/4-20.



Flat Washers made of nylon in number 4, 6, 8, 10 and 1/4″ screw hole sizes.

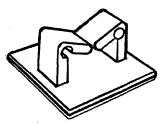
Clips and Saddles

Model ABC-1 Mini-Clip retains bundles up to 1/8″ x 1/4″ under its extra-wide reinforced spring-arm. The funnel-V opening allows easy bundle insertion. With adhesive-backed base. Base dimensions— 5/8″ x 5/8″, 1/4″ high.

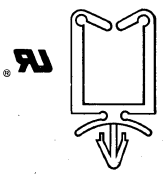


FRC Series Flat Ribbon Cable Clip accepts all ribbon cable widths and thicknesses in virtually every layout arrangement. For extra mounting strength, a center molded screw or rivet hole is provided in the adhesive-backed base. Base dimensions— 1″ x 1-1/8″, 5/16″ high.

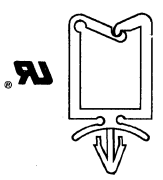
Model ACC-3, -4 and -6 Cord Clips for diameters of 3/16″, 1/4″ and 3/8″. The base is adhesive backed. Base dimensions— (ACC-3) 5/8″ x 5/8″, 5/16″ high; (ACC-4) 5/8″ x 5/8″, 3/8″ high, and (ACC-6) 3/4″ x 3/4″, 1/2″ high.



ABWS Series Tension-Gate Wire Saddles are available in six sizes to retain maximum wire bundles of 3/16″ x 7/16″ through 3/4″ x 3/4″. Adhesive backed mounting. Base dimensions— (ABWS-1T, -2T & 3T) 3/4″ x 3/4″; 1/2″, 11/16″ or 1-1/16″ high, (ABWS-11T,-12T,-13T) 3/4″ x 1-3/16″; 1/2″, 3/4″ or 1-1/16″ high.

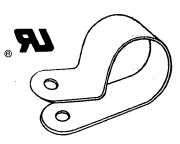


PMWS Series Tension-Gate Wire Saddles push-mount into any .187″ hole and are available in four sizes to secure wire capacities of 3/16″ x 7/16″ through 1″ x 7/16″. Thickness compensators hold saddle securely in chassis up to 3/32″ thick. Base dimensions— 3/16″ x 5/8″, 9/16″ through 1-7/16″ high.

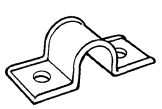


L-Series Locking Gate Wire Saddles hold wires more securely, but still allow wire release. Push-mount fits any .187″ hole and thickness compensator holds chassis up to 3/32″ thick. In four sizes for wire capacities from 3/16″ x 7/16″ through 1″ x 7/16″. Base dimensions— 3/16″ x 5/8″, 9/16″ through 1-7/16″ high.

Cable Clamps



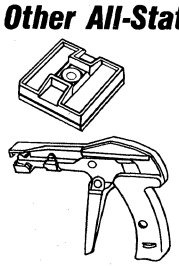
L and H-Series Cable Clamps for one-piece bundling and mounting. Open "V" design for easy bundle insertion. L-Series clamps have a 3/8″ wide, .050″ thick strap for diameters from 1/8″ through 1/2″. H-Series clamps have a 1/2″ wide, .060″ thick strap for diameters from 1/8″ through 1-1/2″.



U-Clamps for securing cable or wire bundles from 1/8″ through 1/2″ are available with and without adhesives in eight models. Overall dimensions— .38″ x 1.22″ through .55″ x 1.66″.

Half-Clamps secure bundles from 1/8″ through 1/2″ while allowing wiring changes without clamp removal. Available with and without adhesives in eight models. Overall dimensions— .38″ x .80″ through .50″ x 1.02″.

Other All-States Products



Mounting Bases for Cable Ties: Adhesive-backed, screw-mount and push-mount.

Cable Tie Accessories: Installation Tools, ID Plates, Marking Pens, Cable Connector Rings and Cable Spacers.

For More Information: Please call or write for a copy of our full-line catalog or for more detailed information.

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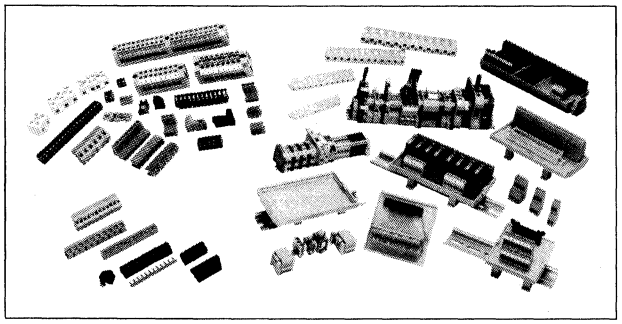
TELEPHONE: (201) 359-4454 FAX 201-359-8178

SELECT FROM ALTECH'S COMPREHENSIVE TERMINAL BLOCK FAMILY

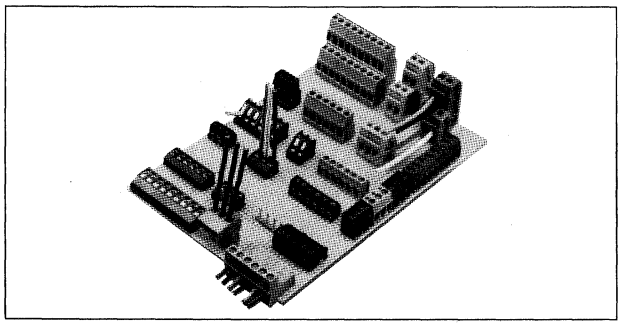


Today's design engineer can achieve modern, reliable, cost-effective wire terminations with terminal blocks from Altech. Altech terminal blocks deliver high density, dead-front safety, modularity, and increased flexibility to make your product more competitive. All Altech terminal blocks comply with international electrical requirements, including UL and CSA.

REQUEST OUR FULL-LINE CATALOG FOR COMPLETE INFORMATION ON:

- DIN Rail Mount Terminal Blocks
- Modular Panel Mount Terminal Blocks
- Panel Mount Tubular Screw Terminal Strips
- Interface and Electronic Modules
- Printed Circuit Board Mini-Terminal Blocks
- High-Temperature Ceramic Terminals

MINIATURE TERMINAL BLOCKS FOR PC BOARDS



Take advantage of one of the most versatile selections of PC board terminal blocks. Manufactured to highest quality standards, Altech modular PC board terminal blocks offer:

- Wide selection—Standard front, top and 45° wire entry, plus two pluggable terminal block types in metric and US pin spacings.
- High density—5 circuits/in. for single-level terminals and 10 circuits/in. for double-level.
- Reliable connection—2 distinct clamp designs. Our cage and tubular screw clamp designs produce gas-tight, vibration-proof, electrically efficient connections.
- Modular insulated housings—Excellent mechanical strength, dielectric insulation properties, and temperature resistance. Special modular tongue-and-groove design and precision molding ensure quick, easy joining of 2-3 pole terminal modules into multi-pole assemblies.

AK SERIES STANDARD PC BOARD TERMINAL BLOCKS

TUBULAR SCREW CLAMP

- Multi-position, modular
- With wire protector
- Front and top wire entry
- Colors: gray or blue

CAGE CLAMP

- Multi-position modular
- Front, 45° and double level
- Colors: green, gray or blue

TWO PIECE PLUGGABLE PC BOARD TERMINAL BLOCKS

TYPE AK 900/STL for a high number of mating cycles:

- Cage clamp design
- Vertical or horizontal headers
- Locking mechanism prevents premature unplugging
- Optional keying prevents misplugging with no loss of position.

TYPE AK 130/STL for a moderate number of mating cycles:

- Tubular screw clamp design
- Pin type header
- Dual contact system for front and top wire entry

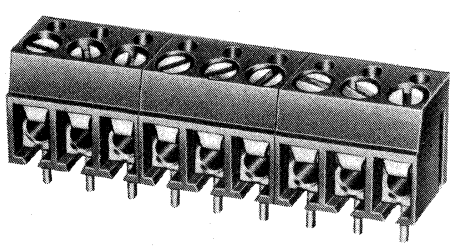
USE THE CRITERIA IN THE TABLE BELOW WHEN SPECIFYING OUR AK SERIES OF FRONT, TOP OR 45 DEGREE WIRE ENTRY CONFIGURATIONS AS WELL AS OUR PLUGGABLE TERMINALS.

Terminal Type AK	100	110	120	125	130	300	Z350	500	700	Z700	710	750	Z750	900	Z900
Pin spacing	5	7.5	.2 in.	.2 in.	5	5	.2 in.	5	5	.2 in.	7.5	5	.2 in.	5	.2 in.
Voltage (U.L.)	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
Current (U.L.)	15	15	15	15	10	15	15	15	15	15	15	15	15	15	15
Max wire size	14	14	14	14	14	12	14	14	12	12	12	12	12	12	12
Wire entry	F	F	F	t	Ft	45	F	F	F	F	F	F	F	Ft	Ft
Clamp design	TS	TS	TS	TS	TS	C	C	TS	C	C	C	C	C	C	C
Terminal config.	S	S	S	S	S	S	S	S	S	S	S	D	D	S	S
Comment					*1									*2	*2

F = Front; t = Top; 45 = 45 degrees; C = Cage clamp design, Industrial grade; TS = Tubular screw/wire protector, Commercial, Industrial grade; S = Single level; D = Double level. *1 Used with STL130 Pin Headers; *2 Used with horizontal STL900, STLZ900 or vertical STL905, STL Z905 Headers.

AK 100 Series

Tubular screw type, miniature block, 12.5mm high, front wire entry, 300 V, 15A, pin spacing 5.0mm (.197 in.), with wire protector (wp).



AK 100 Spacing 5 mm

Ordering information for the most popular PC board terminals is shown in the tables below.

Poles	Type	Order No.	Length mm	Length (in.)
2	AK100/2wp	30.002	10	(.394)
3	AK100/3wp	30.003	15	(.591)
4	AK100/4wp	30.004	20	(.788)
5	AK100/5wp	30.005	25	(.985)
6	AK100/6wp	30.006	30	(1.182)
7	AK100/7wp	30.007	35	(1.379)
8	AK100/8wp	30.008	40	(1.576)
9	AK100/9wp	30.009	45	(1.773)
10	AK100/10wp	30.010	50	(1.97)
11	AK100/11wp	30.011	55	(2.167)
12	AK100/12wp	30.012	60	(2.364)
12+*				

SEE OUR ENCLOSURES IN SECTION 1400 C•1035/SEE OUR RELAYS IN SECTION 4500 B•1421/SEE OUR SWITCHES IN SECTION 5100 B•1677

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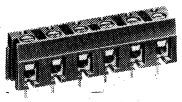
TELEPHONE: (201) 359-4454 FAX 201-359-8178

AK SERIES MINIATURE TERMINAL BLOCKS

AK 110 Series

Tubular screw type, miniature block, 12.5 mm high, front wire entry, 300V, 15A, pin spacing 7.5 mm (.295 in.), with wire protector (wp).

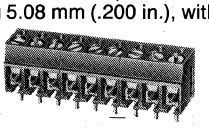


Poles	Type	Order No.	Length mm	Length (in.)
2	AK110/2wp	30.102	15.0	(.591)
3	AK110/3wp	30.103	22.5	(.887)
4	AK110/4wp	30.104	30.0	(1.182)
5	AK110/5wp	30.105	37.5	(1.478)
6	AK110/6wp	30.106	45.0	(1.773)
7	AK110/7wp	30.107	52.5	(2.069)
8	AK110/8wp	30.108	60.0	(2.364)
9	AK110/9wp	30.109	67.5	(2.660)
10	AK110/10wp	30.110	75.0	(2.955)
11	AK110/11wp	30.111	82.5	(3.251)
12	AK110/12wp	30.112	90.0	(3.546)
12+*				

*Over 12 poles available: Info and pricing available upon request.

AK 120 Series

Tubular screw type, miniature block, 13.0 mm high, front wire entry, 300V, 15A, pin spacing 5.08 mm (.200 in.), with wire protector (wp).

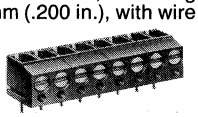


Poles	Type	Order No.	Length mm	Length (in.)
2	AK120/2wp	30.202	10.16	(.400)
3	AK120/3wp	30.203	15.24	(.600)
4	AK120/4wp	30.204	20.32	(.801)
5	AK120/5wp	30.205	25.40	(1.001)
6	AK120/6wp	30.206	30.48	(1.201)
7	AK120/7wp	30.207	35.56	(1.401)
8	AK120/8wp	30.208	40.64	(1.601)
9	AK120/9wp	30.209	45.72	(1.801)
10	AK120/10wp	30.210	50.80	(2.001)
11	AK120/11wp	30.211	55.88	(2.202)
12	AK120/12wp	30.212	60.96	(2.402)
12+*				

*Over 12 poles available: Info and pricing available upon request.

AK 125 Series

Tubular screw type, miniature block, 13 mm high, top wire entry, 300V, 15A, pin spacing 5.08 mm (.200 in.), with wire protector (wp).

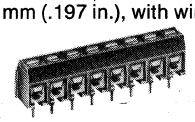


Poles	Type	Order No.	Length mm	Length (in.)
2	AK125/2wp	30.252	10.16	(.400)
3	AK125/3wp	30.253	15.24	(.600)
4	AK125/4wp	30.254	20.32	(.801)
5	AK125/5wp	30.255	25.40	(1.001)
6	AK125/6wp	30.256	30.48	(1.201)
7	AK125/7wp	30.257	35.56	(1.401)
8	AK125/8wp	30.258	40.64	(1.601)
9	AK125/9wp	30.259	45.72	(1.801)
10	AK125/10wp	30.260	50.80	(2.002)
11	AK125/11wp	30.261	55.88	(2.202)
12	AK125/12wp	30.262	60.96	(2.402)
12+*				

*Over 12 poles available: Info and pricing available upon request.

AK 500 Series

Tubular screw type, micro block, 10.0 mm high front wire entry, 300V, 15A, pin spacing 5.0 mm (.197 in.), with wire protector (wp), (*3).

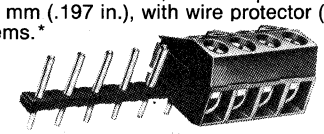


Poles	Type	Order No.	Length mm	Length (in.)
2	AK500/2wp	30.702	10	(.394)
3	AK500/3wp	30.703	15	(.591)
4	AK500/4wp	30.704	20	(.788)
5	AK500/5wp	30.705	25	(.985)
6	AK500/6wp	30.706	30	(1.182)
7	AK500/7wp	30.707	35	(1.379)
8	AK500/8wp	30.708	40	(1.576)
9	AK500/9wp	30.709	45	(1.773)
10	AK500/10wp	30.710	50	(1.97)
11	AK500/11wp	30.711	55	(2.167)
12	AK500/12wp	30.712	60	(2.367)
12+*				

*Over 12 poles available: Info and pricing available upon request. (*3) Also available with 5.08 mm (.200 in.) pin spacing please inquire.

AK130 Series

Tubular screw type, pluggable miniature block, front or top wire entry, 300V, 10A, pin spacing 5.0 mm (.197 in.), with wire protector (wp), featuring dual contact systems.*

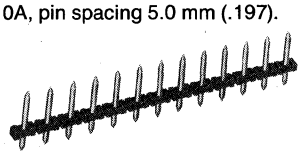


Poles	Type	Order No.	Length mm	Length (in.)
2	AK130/2wp	30.302	10	(.394)
3	AK130/3wp	30.303	15	(.591)
4	AK130/4wp	30.304	20	(.788)
5	AK130/5wp	30.305	25	(.985)
6	AK130/6wp	30.306	30	(1.182)
7	AK130/7wp	30.307	35	(1.379)
8	AK130/8wp	30.308	40	(1.576)
9	AK130/9wp	30.309	45	(1.773)
10	AK130/10wp	30.310	50	(1.97)
11	AK130/11wp	30.311	55	(2.167)
12	AK130/12wp	30.312	60	(2.364)
12+*				

*To be used with STL130 headers. Order separately.

STL 130 Series

*PIN Header, 10A, pin spacing 5.0 mm (.197).



Poles	Type	Order No.	Length mm	Length (in.)
2	STL130/2	30.352	10	(.394)
3	STL130/3	30.353	15	(.591)
4	STL130/4	30.354	20	(.788)
5	STL130/5	30.355	25	(.985)
6	STL130/6	30.356	30	(1.182)
7	STL130/7	30.357	35	(1.379)
8	STL130/8	30.358	40	(1.576)
9	STL130/9	30.359	45	(1.773)
10	STL130/10	30.360	50	(1.97)
11	STL130/11	30.361	55	(2.167)
12	STL130/12	30.362	60	(2.364)
12+*				

*To be used with AK130 Series pluggable terminal blocks.

Marking Strips for AK Series Terminal Blocks

Pressure sensitive adhesive strips supplied on cards containing 25 identical strips each imprinted with 12 consecutive numbers as indicated below, or without imprint for customer markings.

Type	Cat. No.	Imprint
KZS 101	30.096	1-12
KZS 102	30.097	13-24
KZS 103	30.098	12-1
KZS 100	30.099	None

Special imprints are available

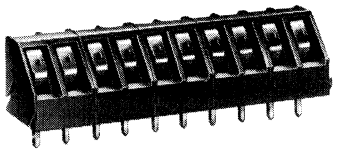
SEE OUR ENCLOSURES IN SECTION 1400 C•1035/SEE OUR RELAYS IN SECTION 4500 B•1421/SEE OUR SWITCHES IN SECTION 5100 B•1677

Altech Corp. 349 ROUTE 206 SOUTH, SOMERVILLE, N.J. 08876
TELEPHONE: (201) 359-4454 FAX 201-359-8178

AK SERIES MINIATURE TERMINAL BLOCKS

AK 300 Series

Cage clamp design, angled miniature block, 12.5 mm high, 45 degree wire entry, 300V, 15A, pin spacing 5.0 mm (.197 in.), (*3)

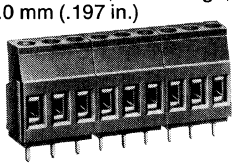


Poles	Type	Order No.	Length mm	Length (in.)
2	AK300/2	30.602	10	(.394)
3	AK300/3	30.603	15	(.591)
4	AK300/4	30.604	20	(.788)
5	AK300/5	30.605	25	(.985)
6	AK300/6	30.606	30	(1.182)
7	AK300/7	30.607	35	(1.379)
8	AK300/8	30.608	40	(1.576)
9	AK300/9	30.609	45	(1.773)
10	AK300/10	30.610	50	(1.970)
11	AK300/11	30.611	55	(2.167)
12	AK300/12	30.612	60	(2.364)
12+*				

*Over 12 poles available: Info and pricing available upon request. (*3) Also available with 5.08 mm (.200) pin spacing. Please inquire.

AK 700 Series

Cage clamp design, miniature block, 19mm high, front wire entry, 300V, 15A, pin spacing 5.0 mm (.197 in.)

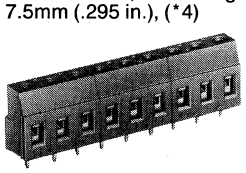


Poles	Type	Order No.	Length mm	Length (in.)
2	AK700/2	30.802	10	(.394)
3	AK700/3	30.803	15	(.591)
4	AK700/4	30.804	20	(.788)
5	AK700/5	30.805	25	(.985)
6	AK700/6	30.806	30	(1.182)
7	AK700/7	30.807	35	(1.379)
8	AK700/8	30.808	40	(1.576)
9	AK700/9	30.809	45	(1.773)
10	AK700/10	30.810	50	(1.970)
11	AK700/11	30.811	55	(2.167)
12	AK700/12	30.812	60	(2.364)
12+*				

*Over 12 poles available: Info and pricing available upon request.

AK 710 Series

Cage clamp design, miniature block, 19mm high, front wire entry 300V, 15A, pin spacing 7.5mm (.295 in.), (*4)

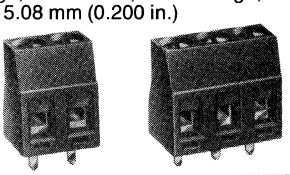


Poles	Type	Order No.	Length mm	Length (in.)
2	AK710/2	30.002	15.0	(.591)
3	AK710/3	30.003	22.5	(.887)
4	AK710/4	30.004	30.0	(1.182)
5	AK710/5	30.005	37.5	(1.478)
6	AK710/6	30.006	45.0	(1.773)
7	AK710/7	30.007	52.5	(2.069)
8	AK710/8	30.008	60.0	(2.364)
9	AK710/9	30.009	67.5	(2.660)
10	AK710/10	30.010	75.0	(2.955)
11	AK710/11	30.011	82.5	(3.251)
12	AK710/12	30.012	90.0	(3.546)
12+*				

*Over 12 poles available: Info and pricing available upon request. (*4) Also available with 7.62 mm (.300 in.) pin spacing. Please inquire.

AKZ 350 Series

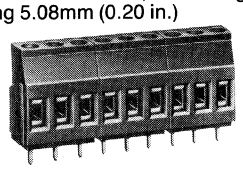
Cage clamp design, micro block, 13.2mm high, front wire entry, 300V, 15A, pin spacing 5.08 mm (0.200 in.)



Poles	Type	Order No.	Length mm	Length (in.)
2	AKZ350/2	32.002	10	(.394)
3	AKZ350/3	32.003	15	(.591)
4	AKZ350/4	32.004	20	(.788)
5	AKZ350/5	32.005	25	(.985)
6	AKZ350/6	32.006	30	(1.182)
7	AKZ350/7	32.007	35	(1.379)
8	AKZ350/8	32.008	40	(1.576)
9	AKZ350/9	32.009	45	(1.773)
10	AKZ350/10	32.010	50	(1.970)
11	AKZ350/11	32.011	55	(2.167)
12	AKZ350/12	32.012	60	(2.364)
12+*				

AKZ 700 Series

Cage clamp design, miniature block, 19mm high, front wire entry, 300V, 15A, pin spacing 5.08mm (0.20 in.)

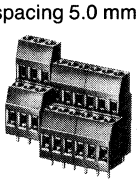


Poles	Type	Order No.	Length mm	Length (in.)
2	AKZ700/2	30.852	10.16	(.400)
3	AKZ700/3	30.853	15.24	(.600)
4	AKZ700/4	30.854	20.32	(.801)
5	AKZ700/5	30.855	25.40	(1.001)
6	AKZ700/6	30.856	30.48	(1.201)
7	AKZ700/7	30.857	35.56	(1.401)
8	AKZ700/8	30.858	40.64	(1.601)
9	AKZ700/9	30.859	45.72	(1.801)
10	AKZ700/10	30.860	50.80	(2.001)
11	AKZ700/11	30.861	55.88	(2.202)
12	AKZ700/12	30.862	60.96	(2.402)
12+*				

*Over 12 poles available: Info and pricing available upon request.

AK 750 Series

Cage clamp design, double level miniature block, 34.0 mm high, front wire entry, 300V, 15A, pin spacing 5.0 mm (.197 in.).



Poles	Type	Order No.	Length mm	Length (in.)
4	AK750/4	31.004	12.5	(.493)
6	AK750/6	31.006	17.5	(.690)
8	AK750/8	31.008	22.5	(.887)
10	AK750/10	31.010	27.5	(1.084)
12	AK750/12	31.012	32.5	(1.281)
14	AK750/14	31.014	37.5	(1.478)
16	AK750/16	31.016	42.5	(1.675)
18	AK750/18	31.018	47.5	(1.872)
20	AK750/20	31.020	52.5	(2.069)
22	AK750/22	31.022	57.5	(2.266)
24	AK750/24	31.024	62.5	(2.463)
24+*				

*Over 24 poles available: Info and pricing available upon request. (*3) Also available with 5.08 mm (.200) pin spacing.

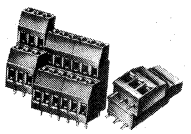
SEE OUR ENCLOSURES IN SECTION 1400 C•1035/SEE OUR RELAYS IN SECTION 4500 B•1421/SEE OUR SWITCHES IN SECTION 5100 B•1677

Altech Corp. 349 ROUTE 206 SOUTH, SOMERVILLE, N.J. 08876
TELEPHONE: (201) 359-4454 FAX 201-359-8178

AK SERIES MINIATURE TERMINAL BLOCKS

AKZ 750 Series

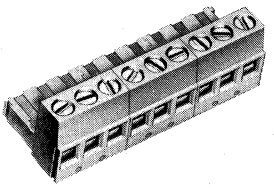
Cage clamp design, double level miniature block, 34.0 mm high, front wire entry, 300V, 15A, pin spacing 5.08 mm (0.20in.)



Poles	Type	Order No.	Length mm	Length (in.)
4	AKZ750/4	31.054	12.58	(.496)
6	AKZ750/6	31.056	17.66	(.696)
8	AKZ750/8	31.058	22.74	(.896)
10	AKZ750/10	31.060	27.82	(1.096)
12	AKZ750/12	31.062	32.90	(1.296)
14	AKZ750/14	31.064	37.98	(1.496)
16	AKZ750/16	31.066	43.06	(1.697)
18	AKZ750/18	31.068	48.14	(1.897)
20	AKZ750/20	31.070	53.22	(2.097)
22	AKZ750/22	31.072	58.30	(2.207)
24	AKZ750/24	31.074	63.38	(2.497)
24 + *				

AK 900 Series

(*6) Cage clamp type, pluggable miniature block front or top wire entry (depending on what type of header used), 300V, 15A, pin spacing 5.0 mm (.197 in.) features positive locking at every pole. (*3).

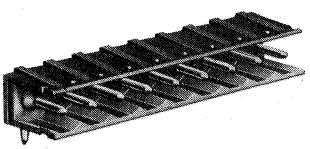


Poles	Type	Order No.	Length mm	Length (in.)
2	AK900/2	31.152	10	(.394)
3	AK900/3	31.153	15	(.591)
4	AK900/4	31.154	20	(.788)
5	AK900/5	31.155	25	(.985)
6	AK900/6	31.156	30	(1.182)
7	AK900/7	31.157	35	(1.379)
8	AK900/8	31.158	40	(1.576)
9	AK900/9	31.159	45	(1.773)
10	AK900/10	31.160	50	(1.970)
11	AK900/11	31.161	55	(2.167)
12	AK900/12	31.162	60	(2.367)
12 + *				

(*3) Also available with 5.08 mm (.200 in.) pin spacing. Please inquire. (*6) To be used with STL900 or STL905 headers.

STL 900 Series

(*8) Shrouded headers, horizontal connector entry, 300V, 15A, pin spacing 5.0 mm (.197 in.) (*3).

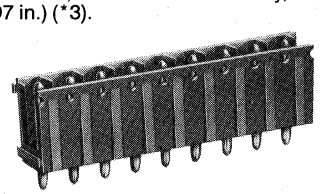


Poles	Type	Order No.	Length mm	Length (in.)
2	STL900/2wp	31.252	10	(.394)
3	STL900/3wp	31.253	15	(.591)
4	STL900/4wp	31.254	20	(.788)
5	STL900/5wp	31.255	25	(.985)
6	STL900/6wp	31.256	30	(1.182)
7	STL900/7wp	31.257	35	(1.379)
8	STL900/8wp	31.258	40	(1.576)
9	STL900/9wp	31.259	45	(1.773)
10	STL900/10wp	31.260	50	(1.970)
11	STL900/11wp	31.261	55	(2.167)
12	STL900/12wp	31.262	60	(2.367)
12 + *				

(*3) Also available with 5.08 mm (.200 in.) pin spacing. (*8) To be used with AK900 Series pluggable terminal blocks.

STL 905 Series

(*8) Shrouded headers, vertical connector entry, 300V, 15A, pin spacing 5.0 mm (.197 in.) (*3).



Poles	Type	Order No.	Length mm	Length (in.)
2	STL905/2wp	31.552	10	(.394)
3	STL905/3wp	31.553	15	(.591)
4	STL905/4wp	31.554	20	(.788)
5	STL905/5wp	31.555	25	(.985)
6	STL905/6wp	31.556	30	(1.182)
7	STL905/7wp	31.557	35	(1.379)
8	STL905/8wp	31.558	40	(1.576)
9	STL905/9wp	31.559	45	(1.773)
10	STL905/10wp	31.560	50	(1.970)
11	STL905/11wp	31.561	55	(2.167)
12	STL905/12wp	31.562	60	(2.367)
12 + *				

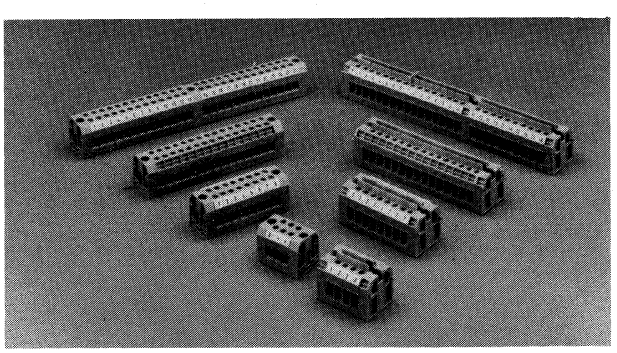
(*3) Also available with 5.08 mm (.200 in.) pin spacing. (*8) To be used with AK900 Series pluggable terminal blocks.

PANEL MOUNT TERMINAL BLOCKS

BKA & RKB Series Panel Mount Modular Terminal Blocks and Assemblies

Altech panel mount modular terminals and assemblies, Types BKA and RKB, offer advanced terminal block designs that replace outdated barrier strips. Use them whenever a space-saving, direct-mount, multi-pole terminal block assembly is required.

- Ordering flexibility—Available as individual, snap-together, single-pole modules and mounting sections to meet changing requirements, or as ready-to-mount, multi-pole assemblies.
- High wiring density—50 terminations/ft.
- Cage-clamp design—Blocks are supplied with open clamps that are ready for immediate wire hook-up, eliminating the need for lugs and crimping.



SEE OUR ENCLOSURES IN SECTION 1400 C•1035/SEE OUR RELAYS IN SECTION 4500 B•1421/SEE OUR SWITCHES IN SECTION 5100 B•1677

Altech Corp. 349 ROUTE 206 SOUTH, SOMERVILLE, N.J. 08876
TELEPHONE: (201) 359-4454 FAX 201-359-8178

PANEL MOUNT TERMINAL BLOCKS

BKA Series

Cage Clamp type, Panel Mount Modular Terminal Assemblies—300V, 20A, #22-12 AWG, UL Rated, 6mm pole spacing, 22mm wide x 22mm high, without marking (*13).

Poles	Type	Order No.	Length mm	Length (in)
2	BKA/2	2170.2	26.5	(1.044)
3	BKA/3	2171.2	32.6	(1.284)
4	BKA/4	2172.2	38.7	(1.525)
5	BKA/5	2173.2	44.8	(1.765)
6	BKA/6	2174.2	50.9	(2.005)
8	BKA/8	2175.2	63.1	(2.486)
10	BKA/10	2176.2	75.3	(2.967)
12	BKA/12	2177.2	87.5	(3.448)
13	BKA/13	2137.2	93.6	(3.688)
14	BKA/14	1038.2	99.7	(3.928)
15	BKA/15	2178.2	105.8	(4.168)
16	BKA/16	1037.2	111.9	(4.409)
18	BKA/18	1038.2	124.1	(4.889)
20	BKA/20	2179.2	136.3	(5.370)
24	BKA/24	1039.2	160.7	(6.332)
Single Pole BKA Terminal Component				
	BKA/1	2158.2	6.0	(.236)
Mounting Section for BKA Components				
	EH2	2136.2	7.5	(.296)

(*13) Marking tags and external jumpers are available, please inquire.

RKB Series

Cage Clamp Type, Panel Mount Modular Terminal Assemblies with Internal Jumper Provision—300V, 20A, #22-12 AWG, UL Rated, 6mm pole spacing, 27mm wide x 23mm high, without marking (*13).

Poles	Type	Order No.	Length mm	Length (in)
2	RKB/2	8852.2	26.5	(1.044)
3	RKB/3	8853.2	32.6	(1.284)
4	RKB/4	8854.2	38.7	(1.525)
5	RKB/5	8855.2	44.8	(1.765)
6	RKB/6	8856.2	50.9	(2.005)
7	RKB/7	8857.2	57.0	(2.246)
8	RKB/8	8858.2	63.1	(2.486)
9	RKB/9	8859.2	69.2	(2.765)
10	RKB/10	8860.2	75.3	(2.967)
11	RKB/11	8861.2	81.4	(3.207)
12	RKB/12	8862.2	87.5	(3.448)
Single Pole RKB Terminal Component				
1	RKB/1	1018.2	6.0	(.236)
Mounting Section for RKB Components				
	EH1	2135.2	7.5	(.296)
Q Type Internal Jumpers (*12)				
2	Q2	2087.0	12	(.473)
3	Q3	2088.0	18	(.709)
4	Q4	2089.0	24	(.946)
5	Q10	2090.0	60	(2.364)

(*12) Other multi-pole jumpers available (*13) Marking tags are available.

TS & TSF Series Tubular Strips for Panel Mounting

These fast, easy-to-use, cost-effective replacements for outdated barrier strips feature:

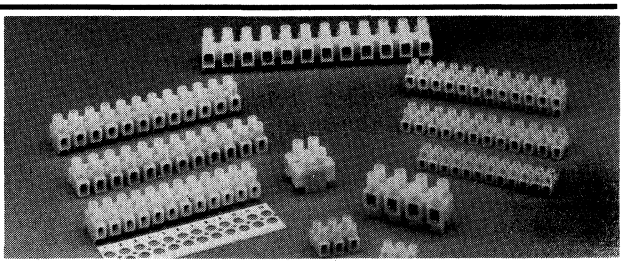
- Open tubular screw/wire protector clamps provide immediate wire hook-up, eliminating terminal lugs.
- Application flexibility—panel mount or free-floating.
- Easy cutting to desired number of poles with pocket knife—or order precut strips to your required number of poles.
- Flat Base or stand-off foot versions.

TS1.5 Series Tubular Screw Type Panel Mount Terminal Strip—flat base, no foot, 18.2mm wide x 13.8mm high (*9), 300V, 15A, #22-16 AWG, 8mm pole spacing with wire protectors (*11).

TS2.5 Series Tubular Screw Type Panel Mount Terminal Strip—flat base, no foot, 22.5mm wide x 15mm high (*9), 600V, 30A, #18-12 AWG, UL rated, 10mm pole spacing with wire protectors (*10).

TS6.0 Series Tubular Screw Type Panel Mount Terminal Strip—flat base, no foot, 23.5mm wide x 18mm high (*9), 600V, 30A #18-10 AWG, UL rated, 12mm pole spacing with wire protectors. (*10).

Poles	Type	Order No.	Length mm	Length (in)
2	TS1.5/2wp	40.002	15.0	(.591)
3	TS1.5/3wp	40.003	23.0	(.906)
4	TS1.5/4wp	40.004	31.5	(1.241)
5	TS1.5/5wp	40.005	39.5	(1.556)
6	TS1.5/6wp	40.006	47.5	(1.872)
7	TS1.5/7wp	40.007	55.5	(2.187)
8	TS1.5/8wp	40.008	64.0	(2.522)
9	TS1.5/9wp	40.009	72.0	(2.837)
10	TS1.5/10wp	40.010	80.0	(3.152)
11	TS1.5/11wp	40.011	88.5	(3.487)
12	TS1.5/12wp	40.012	96.5	(3.802)
2	TS2.5-4/2wp	40.202	17.0	(.670)
3	TS2.5-4/3wp	40.203	27.0	(1.063)
4	TS2.5-4/4wp	40.204	37.0	(1.458)
5	TS2.5-4/5wp	40.205	47.0	(1.852)
6	TS2.5-4/6wp	40.206	57.0	(2.246)
7	TS2.5-4/7wp	40.207	67.0	(2.640)
8	TS2.5-4/8wp	40.208	77.0	(3.034)
9	TS2.5-4/9wp	40.209	87.0	(3.428)
10	TS2.5-4/10wp	40.210	97.0	(3.822)
11	TS2.5-4/11wp	40.211	107.0	(4.216)
12	TS2.5-4/12wp	40.212	117.0	(4.610)
2	TS6.0/2wp	40.402	20.0	(.788)
3	TS6.0/3wp	40.403	32.0	(1.261)
4	TS6.0/4wp	40.404	44.0	(1.734)
5	TS6.0/5wp	40.405	56.0	(2.206)
6	TS6.0/6wp	40.406	68.0	(2.680)
7	TS6.0/7wp	40.407	80.0	(3.152)
8	TS6.0/8wp	40.408	92.0	(3.625)
9	TS6.0/9wp	40.409	104.0	(4.098)
10	TS6.0/10wp	40.410	116.0	(4.570)
11	TS6.0/11wp	40.411	128.0	(5.043)
12	TS6.0/12wp	40.412	140.0	(5.516)



TSF1.5 Series Tubular Screw Type Panel Mount Terminal Strip—medium height foot, 18.2mm wide x 17.3mm high (*9), 300V, 15A (*11), #22-16 AWG, 8mm pole spacing with wire protectors (*10).

TSF2.5 Series Tubular Screw Type Panel Mount Terminal Strip—medium height foot, 22.5mm wide x 19.5mm high (*9), 600V, 30A, #18-12 AWG, UL rated, 10mm pole spacing with wire protectors. (*10).

TSF6.0 Series Tubular Screw Type Panel Mount Terminal Strip—medium height foot, 23.5mm wide x 22.5mm high (*9), 600V, 30A, #18-10 AWG, UL rated, 12mm pole spacing with wire protectors. (*10).

Poles	Type	Order No.	Length mm	Length (in)
2	TSF1.5/2wp	40.102	15.0	(.591)
3	TSF1.5/3wp	40.103	23.0	(.906)
4	TSF1.5/4wp	40.104	31.5	(1.241)
5	TSF1.5/5wp	40.105	39.5	(1.556)
6	TSF1.5/6wp	40.106	47.5	(1.875)
7	TSF1.5/7wp	40.107	55.5	(2.187)
8	TSF1.5/8wp	40.108	64.0	(2.522)
9	TSF1.5/9wp	40.109	72.0	(2.837)
10	TSF1.5/10wp	40.110	80.0	(3.152)
11	TSF1.5/11wp	40.111	88.5	(3.487)
12	TSF1.5/12wp	40.112	96.5	(3.802)
2	TSF2.5-4/2wp	40.302	17.0	(.670)
3	TSF2.5-4/3wp	40.303	27.0	(1.063)
4	TSF2.5-4/4wp	40.304	37.0	(1.458)
5	TSF2.5-4/5wp	40.305	47.0	(1.852)
6	TSF2.5-4/6wp	40.306	57.0	(2.246)
7	TSF2.5-4/7wp	40.307	67.0	(2.640)
8	TSF2.5-4/8wp	40.308	77.0	(3.034)
9	TSF2.5-4/9wp	40.309	87.0	(3.428)
10	TSF2.5-4/10wp	40.310	97.0	(3.822)
11	TSF2.5-4/11wp	40.311	107.0	(4.216)
12	TSF2.5-4/12wp	40.312	117.0	(4.610)
2	TSF6.0/2wp	40.502	20.0	(.788)
3	TSF6.0/3wp	40.503	32.0	(1.261)
4	TSF6.0/4wp	40.504	44.0	(1.734)
5	TSF6.0/5wp	40.505	56.0	(2.206)
6	TSF6.0/6wp	40.506	68.0	(2.680)
7	TSF6.0/7wp	40.507	80.0	(3.152)
8	TSF6.0/8wp	40.508	92.0	(3.625)
9	TSF6.0/9wp	40.509	104.0	(4.098)
10	TSF6.0/10wp	40.510	116.0	(4.570)
11	TSF6.0/11wp	40.511	128.0	(5.043)
12	TSF6.0/12wp	40.512	140.0	(5.516)

(*9) Dimensions are subject to change, confirm when ordering. (*10) Also available without wire protectors. (*11) U.L. Rating applied for.

SEE OUR ENCLOSURES IN SECTION 1400 C•1035/SEE OUR RELAYS IN SECTION 4500 B•1421/SEE OUR SWITCHES IN SECTION 5100 B•1677

INDUSTRY
STANDARD
PRODUCTS
In stock
and ready
to ship
from
AMP

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ACTION PIN, AMP, AMP-LATCH, AMPLIMITE, AMPMODU, CHAMP, CHAMP-LOK, DIPLOMATE, MATE-N-LOK, OPTIMATE, PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND—Trademarks of AMP Incorporated.

.050" Centerline Mass-Terminated Ribbon Cable Connector System (AMP-LATCH)

■ Connectors CSA Certified, File No. LR46568

Novo Receptacles, Military Polarized .100" x .100" Centers

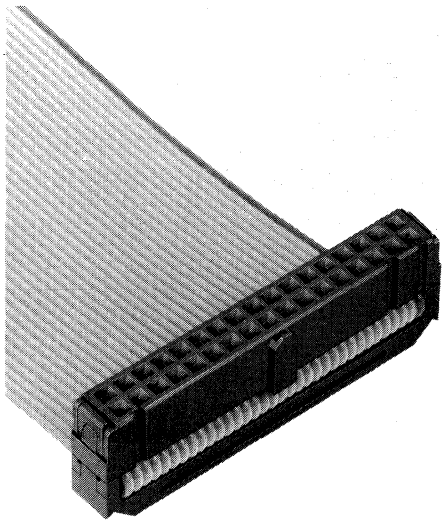
Contacts mate with .025" square or round pins with .245" maximum and .195" minimum lengths.

Material and Finish:

Housing, Cover, & Strain Relief — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated .000030" gold on post/pin mating end, .000100"-.000200" bright tin-lead on termination end, with entire contact underplated .000050" nickel

These receptacles can be used in applications requiring no polarization as well as military polarization.

Number of Positions	Strain Relief Part Numbers	Connector Kit Numbers
10	499252-5	746290-1
14	499252-9	746290-2
16	499252-8	746290-3
20	499252-2	746290-4
24	1-499252-0	746290-5
26	499252-3	746290-6
30	1-499252-2	746290-7
34	499252-6	746290-8
40	499252-1	746290-9
50	499252-4	1-746290-0
60	499252-7	1-746290-1
64	1-499252-3	1-746290-2



Notes: 1. These receptacles include a housing assembly and recessed cover (preassembled). Strain reliefs may be purchased separately.
2. Preassembled receptacle kits listed above are for right-hand orientation of cable.

Novo Receptacles, Center and Military Polarized .100" x .100" Centers

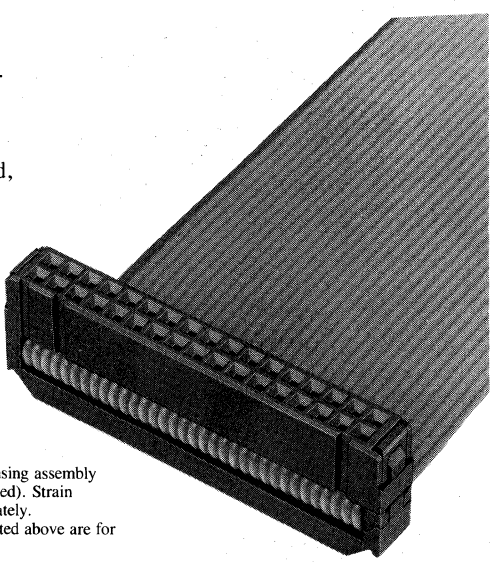
Contacts mate with .025" square or round pins with .245" maximum and .195" minimum lengths.

These receptacles can be used in applications requiring center military polarization.

Material and Finish:

Housing, Cover, & Strain Relief — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated .000030" gold on post/pin mating end, .000100"-.000200" bright tin-lead on termination end, with entire contact underplated .000050" nickel

Number of Positions	Strain Relief Part Numbers	Connector Kit Numbers
10	499252-5	746288-1
14	499252-9	746288-2
16	499252-8	746288-3
20	499252-2	746288-4
24	1-499252-0	746288-5
26	499252-3	746288-6
30	1-499252-2	746288-7
34	499252-6	746288-8
40	499252-1	746288-9
50	499252-4	1-746288-0
60	499252-7	1-746288-1
64	1-499252-3	1-746288-2



Notes: 1. These receptacles include a housing assembly and recessed cover (preassembled). Strain reliefs may be purchased separately.
2. Preassembled receptacle kits listed above are for right-hand orientation of cable.

AMP-LATCH—Trademark of AMP Incorporated

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Card Edge Connectors Without Mounting Ears

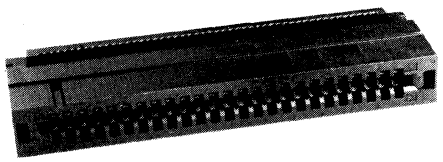
For .055″-.070″ thick pc boards

Material and Finish:

Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated .000030″ gold on pc board mating end, .000100″-.000200″ bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Positions	Connector Kit Numbers
10	111109-8
14	111109-9
16	1-111109-0
20	111109-6
26	111109-5
30	111109-4
34	111109-3
40	111109-2
44	1-111109-2
50	111109-1
60	111109-7
64	1-111109-1

Note: These connector kits include a housing assembly and cover (preassembled).



Card Edge Connectors With Round-Hole Mounting Ears

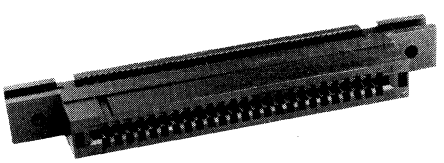
For .055″-.070″ thick pc boards

Material and Finish:

Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated .000030″ gold on pc board mating end, .000100″-.000200″ bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Positions	Connector Kit Numbers
10	111210-8
14	111210-9
16	1-111210-0
20	111210-6
26	111210-5
30	111210-4
34	111210-3
40	111210-2
44	1-111210-2
50	111210-1
60	111210-7
64	1-111210-1

Note: These connector kits include a housing assembly and cover (preassembled).



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AMP Incorporated, Harrisburg, PA 17105

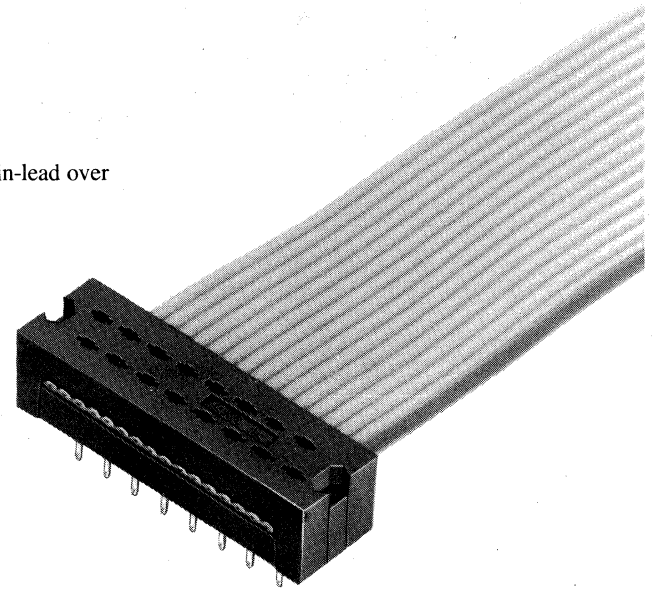
AMP

.050" Centerline Mass-Terminated Ribbon Cable Connector System (AMP-LATCH)

DIP Plugs
.100" x .100" Centers

.156" Post Length

Material and Finish:
Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, plated .000100"-.000200" bright tin-lead over .000050" nickel on entire contact



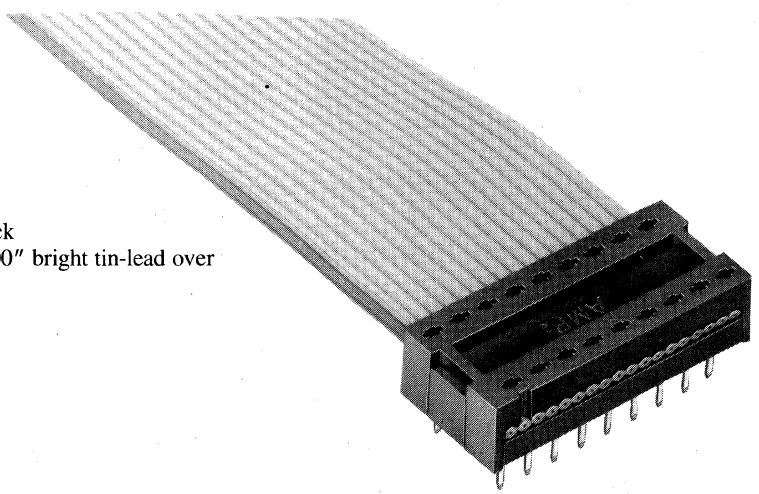
Number of Positions	Plug Kit Numbers
10	746610-1
14	746610-2
16	746610-3
20	746610-4
24	746610-5
26	746610-6
30	746610-7
34	746610-8
40	746610-9
44	1-746610-3
50	1-746610-0
60	1-746610-1
64	1-746610-2

Note: These plug kits contain a housing assembly and cover (preassembled).

DIP Plugs
.100" x .300" Centers

.156" Post Length

Material and Finish:
Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, plated .000100"-.000200" bright tin-lead over .000050" nickel on entire contact



Number of Positions	Plug Kit Numbers
8	746613-1
14	746613-2
16	746613-3
18	746613-4
20	746613-5

Note: These plug kits contain a housing assembly and cover (preassembled).

AMP-LATCH—Trademark of AMP Incorporated

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Paddle Board Connectors "Full Row" Contact Pattern

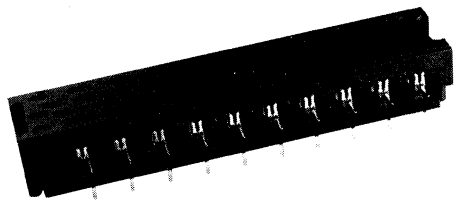
.100″ Post Length

Material and Finish:

Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, plated .000100″-.000200″ bright tin-lead over .000050″ nickel on entire contact

Number of Positions	Connector Kit Numbers
12	111035-1
16	111035-2
20	111035-3
24	111035-4
36	111035-7
40	111035-8
60	1-111035-3

Note: These connector kits include a housing assembly and cover (preassembled).



Paddle Board Connectors Special Contact Centers

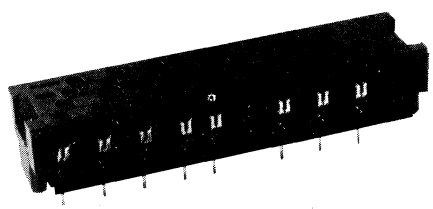
.100″ Post Length

Material and Finish:

Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, plated .000100″-.000200″ bright tin-lead over .000050″ nickel on entire contact

Number of Positions	Connector Kit Numbers
10	111039-1
26	111039-2
34	111039-3
50	111039-4

Note: These connector kits include a housing assembly and cover (preassembled).



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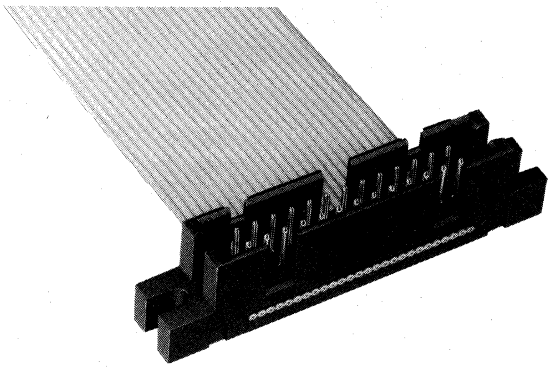
AMP

.050" Centerline Mass-Terminated Ribbon Cable Connector System (AMP-LATCH)



With Slotted Mounting Ears

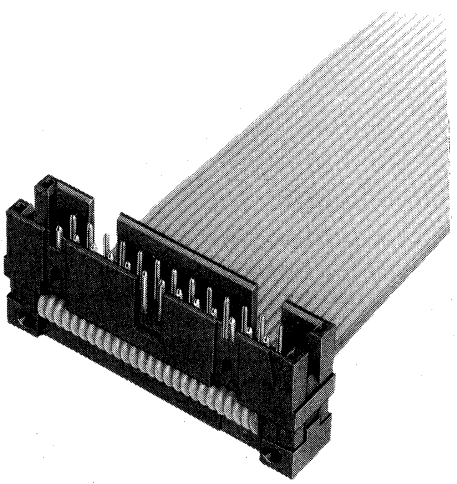
Pin Connectors
With and Without Mounting Ears

Material and Finish:

Housing & Cover — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated with .000030" gold pin mating end, .000100"-.000200" bright tin-lead on termination end, with entire contact underplated .000050" nickel

Number of Positions	Connector Kit Numbers	
	With Slotted Mounting Ears	Without Mounting Ears
10	746353-1	746364-1
14	746353-2	746364-2
16	746353-3	746364-3
20	746353-4	746364-4
24	746353-5	746364-5
26	746353-6	746364-6
30	746353-7	746364-7
34	746353-8	746364-8
40	746353-9	746364-9
50	1-746353-1	1-746364-1
60	1-746353-2	1-746364-2
64	1-746353-3	1-746364-3

Notes: 1. These connector kits include a housing assembly and recessed cover (preassembled).
2. No slot on one end of 10- and 14-position connector.
3. No slot for snap-in polarizer on one end of 10- and 14-position connector.
4. Preassembled connector kits listed above are for right-hand orientation of cable.



Without Mounting Ears

AMP-LATCH—Trademark of AMP Incorporated

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AMP Incorporated, Harrisburg, PA 17105

AMP

Latch/Pin Header Applications

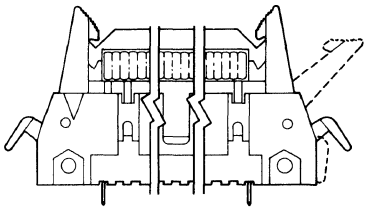


Figure 1. Use Latch Part Number 102186-1 for AMP receptacles with recessed cover and strain relief.

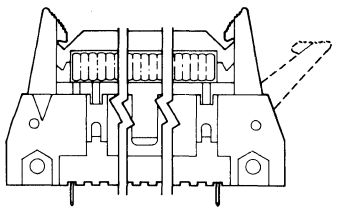


Figure 2. Use Latch Part Number 102320-1 for AMP receptacles with recessed cover and strain relief.

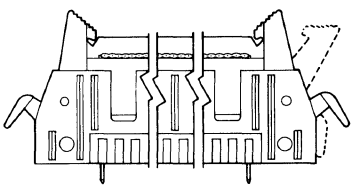


Figure 3. Use Latch Part Number 102185-1 for AMP receptacles with recessed cover.

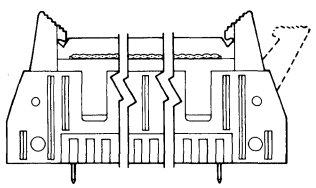


Figure 4. Use Latch Part Number 102312-1 for AMP receptacles with recessed cover.

Latches for Ejection-Style Pin Headers

Material:
Thermoplastic, 94V-0 rated, black

Part Number 102186-1
(With push tabs; see Figure 1

Part Number 102320-1
(Without push tabs; see Figure 2

Part Number 102185-1
(With push tabs; see Figure 3

Part Number 102312-1
(Without push tabs; see Figure 4

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

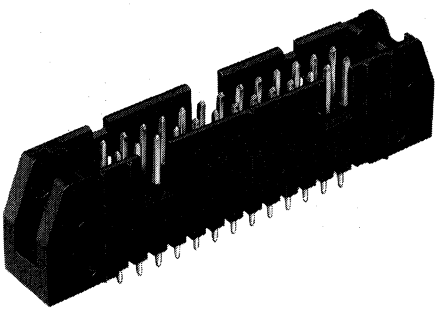
AMP

.050" Centerline Mass-Terminated Ribbon Cable Connector System (AMP-LATCH)

Universal Ejection-Style Pin Headers Military, Center and Dual Polarized .100" x .100" Centers

Material and Finish:

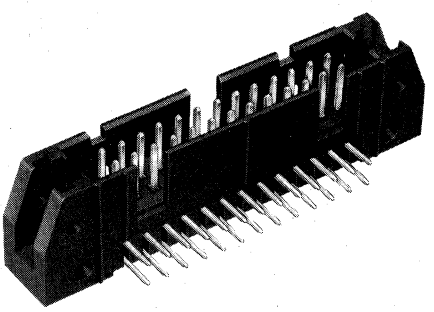
Housing & Latches — Thermoplastic, 94V-0 rated, black
Contacts — Brass or phosphor bronze (at AMP's option), duplex plated .000030" gold on mating end, .000100"-.000200" bright tin-lead on termination end, with entire contact underplated .000050" nickel



Straight-Through, 4-Sided, .025" Square Posts Without Latches .110" Post Length

Number of Positions	Pin Header Part Numbers (Without Latches)
10	102154-1
14	102154-2
16	102154-3
20	102154-4
24	102154-5
26	102154-6
30	102154-7
34	102154-8
40	102154-9
50	1-102154-0
60	1-102154-1
64	1-102154-2

Note: For information regarding latch/pin header applications and for ordering latches separately, see page C•1171.



Right-Angle, 4-Sided, .025" Square Posts Without Latches .110" Post Length

Number of Positions	Pin Header Kit Numbers (Without Latches)
10	102160-1
14	102160-2
16	102160-3
20	102160-4
24	102160-5
26	102160-6
30	102160-7
34	102160-8
40	102160-9
50	1-102160-0
60	1-102160-1
64	1-102160-2

Note: For information regarding latch/pin header applications and for ordering latches separately, see page C•1171.

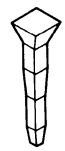
AMP-LATCH—Trademark of AMP Incorporated

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

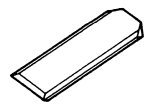
Keying Plug
(For Novo Receptacles)



Material:
Thermoplastic, 94V-0 rated, black

Part Number 499712-1

Keying Plug
(For Card Edge Connectors)



Material:
Thermoplastic, 94V-0 rated, natural color

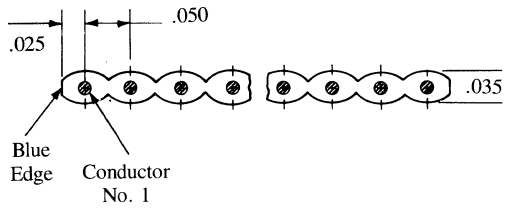
Part Number 88113-1

Planar Ribbon Cable

Conductors — 20 AWG tinned copper, 7/36 stranded
Insulation — Standard gray PVC, flame-retardant, with blue edge on Conductor Number 1 side

Number of Positions	Reel Part Numbers Continuous 100-Foot Reels
9	2-499116-1
10	499116-7
14	499116-1
15	2-499116-0
16	499116-2
18	1-499116-7
20	499116-3
24	1-499116-1
25	1-499116-8
26	499116-4
30	1-499116-2
34	499116-8
36	1-499116-6
37	1-499116-9
40	499116-5
44	1-499116-0
50	499116-6
60	499116-9

Note: Continuous reels are splice free.

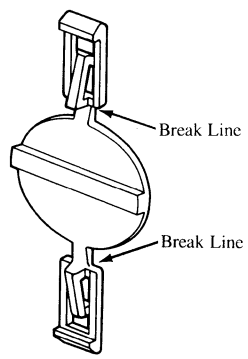


- Cable recognized under the Component Program of Underwriters Laboratories Inc., File No. E53793 UL Style Number 2651, IPC-FC-222/19 Approved, Flammability Rating: VW-1

Polarizer, Snap-In
(For Connectors and Universal Pin Headers)

Material:
Thermoplastic, 94V-0 rated, black

Part Number 499991-2
(Packaged 50 per bag)



The snap-in polarizer provides military polarization for pin connectors (without detent windows) and universal pin headers.

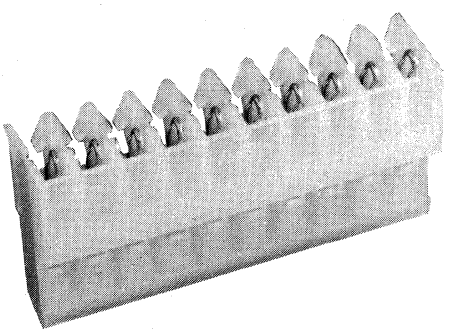
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

- Recognized under the Component Program of Underwriters Laboratories Inc. File No. E28476
- CSA Certified, File No. LR16455



Closed-End Housings .100" Centers

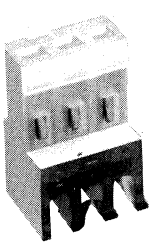
Accepts insulation range of .060" diameter maximum

Material and Finish:

Housing — Thermoplastic, 94V-2 rated
Contacts — Copper alloy, plated as follows:
Tin
Gold[1] — .000015" thick
Gold[2] — .000030" thick

Number of Circuits	Part Numbers						
	Tin Plated				Gold[1]		Gold[2]
	28 AWG	26 AWG	24 AWG	22 AWG	26 AWG	22 AWG	22 AWG
2	640443-2	640442-2	640441-2	640440-2	—	641190-2	641237-2
3	640443-3	640442-3	640441-3	640440-3	—	641190-3	641237-3
4	640443-4	640442-4	640441-4	640440-4	—	641190-4	641237-4
5	640443-5	640442-5	640441-5	640440-5	—	641190-5	—
6	640443-6	640442-6	640441-6	640440-6	641192-6	641190-6	641237-6
7	640443-7	640442-7	640441-7	640440-7	641192-7	641190-7	641237-7
8	640443-8	640442-8	640441-8	640440-8	641192-8	641190-8	641237-8
9	—	640442-9	640441-9	640440-9	—	641190-9	—
10	1-640443-0	1-640442-0	1-640441-0	1-640440-0	—	1-641190-0	1-641237-0
11	—	1-640442-1	1-640441-1	1-640440-1	—	—	—
12	—	1-640442-2	1-640441-2	1-640440-2	—	1-641190-2	—
13	—	—	1-640441-3	1-640440-3	—	1-641190-3	—
14	—	1-640442-4	1-640441-4	1-640440-4	—	1-641190-4	—
15	—	—	1-640441-5	1-640440-5	—	—	—
16	—	—	1-640441-6	1-640440-6	—	—	—
17	—	—	—	1-640440-7	—	—	—
18	—	—	—	1-640440-8	—	—	—
20	—	—	2-640441-0	2-640440-0	—	—	—
28	—	—	—	2-640440-8	—	—	—

Feed-Through Housings .100" Centers



For discrete wire, accepts insulation range of .060" diameter maximum
For ribbon cable, accepts insulation range of .050" diameter maximum

Material and Finish:

Housing — Thermoplastic, 94V-2 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers	
	24 AWG	22 AWG
3	—	640620-3
4	640621-4	640620-4
6	640621-6	640620-6
8	640621-8	—

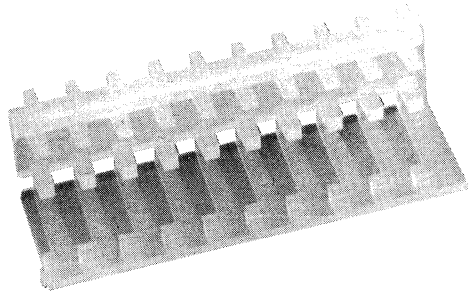
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Strain Relief Covers .060″ OD Wire .100″ Centers

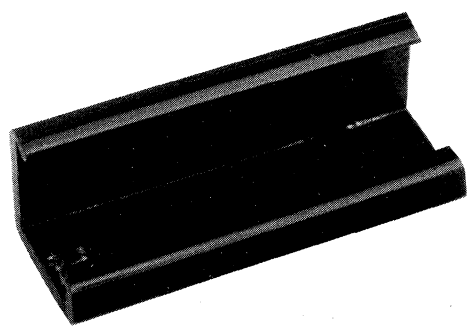
Material:
Nylon, 94V-2 rated, natural color



Number of Circuits	Part Numbers
2	643075-2
3	643075-3
4	643075-4
5	643075-5
6	643075-6
7	643075-7
8	643075-8
10	1-643075-0
12	1-643075-2
13	1-643075-3
15	1-643075-5

Standard Dust Covers .100″ Centers

Material:
Thermoplastic, 94V-2 rated, black

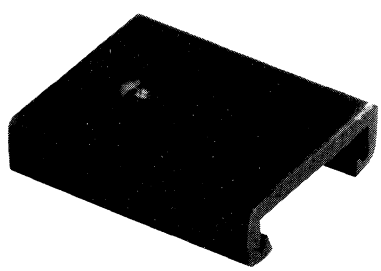


Number of Circuits	Part Numbers
2	640550-2
3	640550-3
4	640550-4
5	640550-5
6	640550-6
7	640550-7
8	640550-8
9	640550-9
10	1-640550-0
11	1-640550-1
12	1-640550-2
14	1-640550-4
16	1-640550-6
18	1-640550-8
20	2-640550-0

Feed-Through Dust Cover .100″ Centers

Material:
6/6 nylon, 94V-2 rated, black

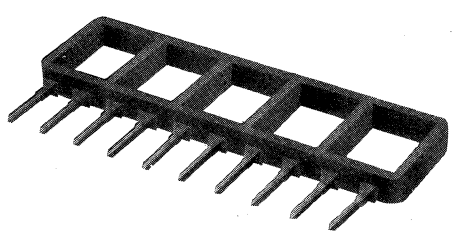
Part Number **640642-5** (5-Circuit)



Keying Plug With Carrier Strip .100″ Centers

Material:
6/6 nylon, natural color

Part Number **641994-1**



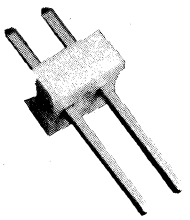
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

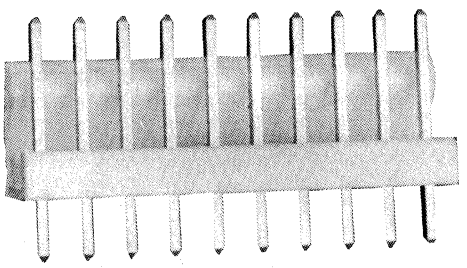
.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

Straight Post Header Assembly (.025" Square Posts) .100" Centers



Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated
Part Number 640452-2 (2-Circuit)

Friction-Lock Straight Post Header Assemblies (.025" Square Posts) .100" Centers



Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, plated as follows:
Tin
Gold[1] — .000015" thick
Gold[2] — .000030" thick

Number of Circuits	Part Numbers		
	Tin plated	Gold[1]	Gold[2]
2	640456-2	641126-2	641215-2
3	640456-3	641126-3	641215-3
4	640456-4	641126-4	641215-4
5	640456-5	641126-5	—
6	640456-6	641126-6	641215-6
7	640456-7	641126-7	—
8	640456-8	641126-8	641215-8
9	640456-9	641126-9	—
10	1-640456-0	1-641126-0	1-641215-0
11	1-640456-1	—	—
12	1-640456-2	1-641126-2	—
13	1-640456-3	—	—
14	1-640456-4	1-641126-4	—
15	1-640456-5	1-641126-5	—
16	1-640456-6	1-641126-6	—
17	1-640456-7	—	—
18	1-640456-8	—	—
19	1-640456-9	—	—
20	2-640456-0	—	—
22	2-640456-2	—	—
24	2-640456-4	—	—

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

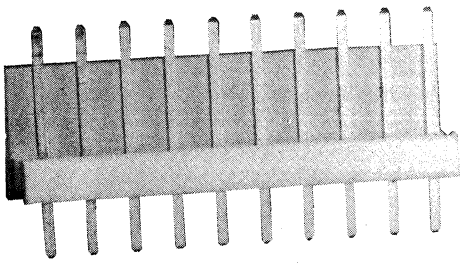
AMP Incorporated, Harrisburg, PA 17105

AMP

Polarized Straight Post Header Assemblies (.025″ Square Posts) .100″ Centers

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

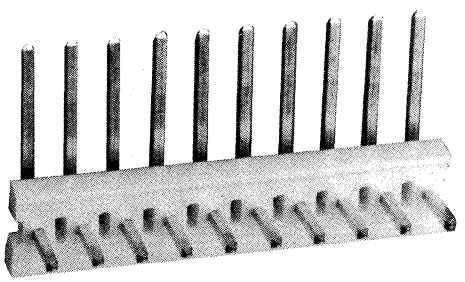
Number of Circuits	Part Numbers
2	640454-2
3	640454-3
4	640454-4
5	640454-5
6	640454-6
7	640454-7
8	640454-8
9	640454-9
10	1-640454-0
12	1-640454-2
14	1-640454-4
15	1-640454-5



Right-Angle Post Header Assemblies (.025″ Square Posts) .100″ Centers

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

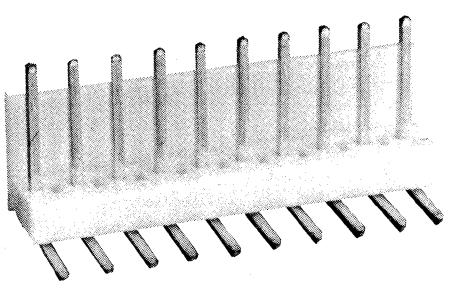
Number of Circuits	Part Numbers
6	640453-6
8	640453-8
10	1-640453-0



Polarized Right-Angle Post Header Assemblies (.025″ Square Posts) .100″ Centers

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers
2	640455-2
3	640455-3
4	640455-4
5	640455-5
7	640455-7
8	640455-8
10	1-640455-0



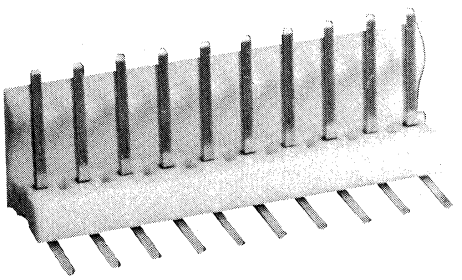
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

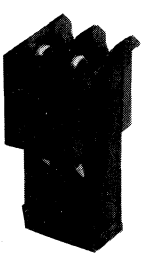
Friction-Lock Right-Angle Post Header Assemblies (.025" Square Posts) .100" Centers



Material and Finish:
Housing — Thermoplastic 94V-0 rated
Contacts — Copper alloy, tin plated or .000015" thick gold plated

Number of Circuits	Part Numbers	
	Tin plated	Gold plated
2	640457-2	—
3	640457-3	—
4	640457-4	—
5	640457-5	—
6	640457-6	—
7	640457-7	—
8	640457-8	—
9	640457-9	—
10	1-640457-0	1-641127-0
11	1-640457-1	—
12	1-640457-2	—
14	1-640457-4	—
15	1-640457-5	—
16	1-640457-6	—
18	1-640457-8	—

Special Connectors for .014"-.020" Diameter Round or Square Leads .100" Centers



Material and Finish:
Housing — Thermoplastic, 94V-2 rated
Contacts — Copper alloy, tin plated

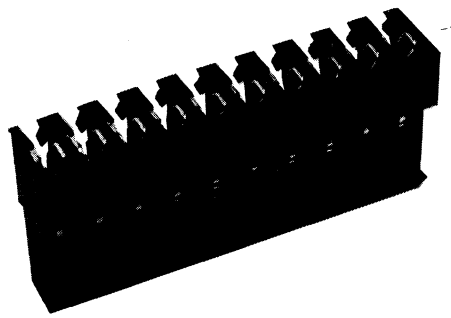
Number of Circuits	Part Numbers		
	26 AWG	24 AWG	22 AWG
2	641536-2	641535-2	641534-2
3	—	—	641534-3

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Closed-End Housings With Lock .156″ Centers



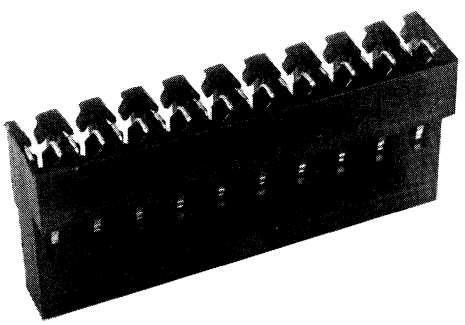
Accepts insulation range of .095″ diameter maximum

Material and Finish:

Housing — Thermoplastic, 94V-2 rated
Contacts — Copper alloy, plated as follows:
Tin
Gold[1] — .000015″ thick
Gold[2] — .000030″ thick

No. of Cir.	Part Numbers							
	Tin plated				Gold[1]		Gold[2]	
	24 AWG	22 AWG	20 AWG	18 AWG	22 AWG	18 AWG	22 AWG	18 AWG
2	640429-2	640428-2	640427-2	640426-2	—	—	641219-2	—
3	640429-3	640428-3	640427-3	640426-3	641150-3	—	—	—
4	640429-4	640428-4	640427-4	640426-4	—	—	—	641217-4
5	640429-5	640428-5	640427-5	640426-5	—	—	—	—
6	640429-6	640428-6	640427-6	640426-6	—	641148-6	—	—
7	640429-7	640428-7	640427-7	640426-7	—	641148-7	—	—
8	640429-8	640428-8	640427-8	640426-8	—	641148-8	—	—
9	640429-9	640428-9	—	640426-9	—	—	—	—
10	1-640429-0	1-640428-0	1-640427-0	1-640426-0	—	1-641148-0	—	—
11	—	1-640428-1	—	1-640426-1	—	—	—	—
12	—	1-640428-2	1-640427-2	1-640426-2	—	—	—	—
13	—	—	—	1-640426-3	—	—	—	—
14	—	—	—	1-640426-4	—	—	—	—
15	—	—	—	1-640426-5	—	—	—	—
16	—	—	—	1-640426-6	—	—	—	—

Closed-End Housings Without Lock .156″ Centers



Accepts insulation range of .095″ diameter maximum

Material and Finish:

Housing — Thermoplastic, 94V-2 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers		
	22 AWG	20 AWG	18 AWG
2	640433-2	640432-2	640431-2
3	640433-3	640432-3	640431-3
4	640433-4	—	640431-4
5	640433-5	—	640431-5
6	640433-6	640432-6	640431-6
7	640433-7	—	640431-7
8	640433-8	640432-8	640431-8
9	640433-9	—	640431-9
10	1-640433-0	1-640432-0	1-640431-0
12	1-640433-2	1-640432-2	1-640431-2
13	—	—	1-640431-3
15	—	—	1-640431-5
18	—	—	1-640431-8

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

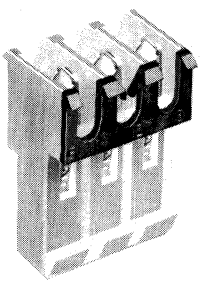
AMP Incorporated, Harrisburg, PA 17105

AMP

.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

Feed-Through Housings With Lock .156" Centers

Accepts insulation range of .095" diameter maximum

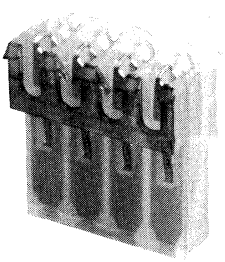


Material and Finish:
Housing — Thermoplastic, 94V-2 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers		
	22 AWG	20 AWG	18 AWG
2	—	640600-2	640599-2
3	640601-3	—	640599-3
4	—	640600-4	640599-4
5	—	—	640599-5
6	640601-6	—	640599-6
8	—	—	640599-8

Feed-Through Housings Without Lock .156" Centers

Accepts insulation range of .095" diameter maximum

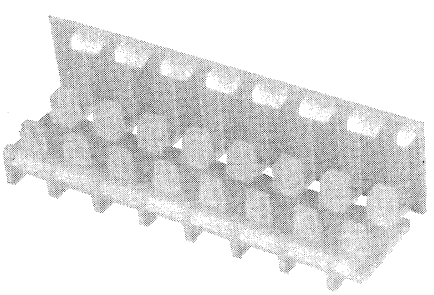


Material and Finish:
Housing — Thermoplastic 94V-2 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Number
	18 AWG
4	640604-4
6	640604-6

Strain Relief Covers .156" Centers

Material:
Nylon, 94V-2 rated, natural color



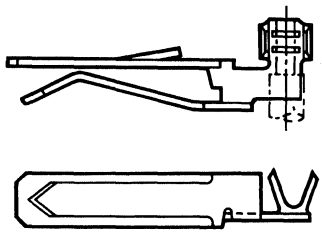
Number of Circuits	Part Numbers	
	.065" Maximum OD	.095" Maximum OD
2	643069-2	643067-2
3	643069-3	643067-3
4	—	643067-4
5	—	643067-5
6	643069-6	643067-6
7	—	643067-7
8	643069-8	643067-8
10	—	1-643067-0
12	1-643069-2	1-643067-2
15	—	1-643067-5

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Crimp Snap-in Contact .156″ Centers



Material and Finish:
Copper alloy, tin plated
.012″ stock thickness

22-18 AWG wire range

Part Number 640559-1 (Loose Piece)

Standard Dust Covers .156″ Centers

Material:
Thermoplastic, 94V-2 rated, black

Number of Circuits	Part Numbers
2	640551-2
3	640551-3
4	640551-4
5	640551-5
6	640551-6
7	640551-7
8	640551-8
9	640551-9
10	1-640551-0
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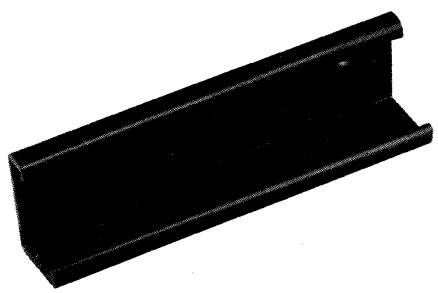
16	1-640551-6

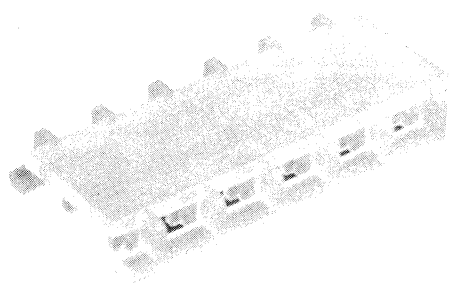


Feed-Through Strain Relief Cover .156″ Centers

Material:
Nylon, 94V-2 rated, natural

Used with .095″ OD maximum wire

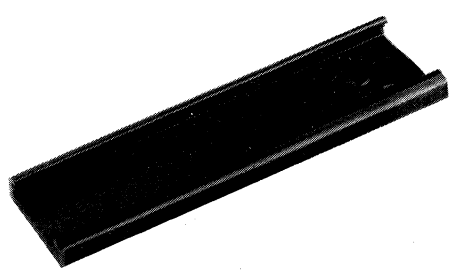
Part Number 643071-6 (6-Circuit)



Feed-Through Dust Cover .156″ Centers

Material:
6/6 nylon, 94V-2 rated, black

Part Number 1-640643-0 (10-Circuit)



Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

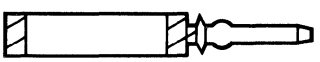
AMP

.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

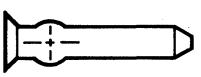
Keying Plugs
.156" Centers

Material:
Nylon, natural color

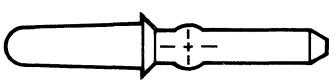
Part Number 641623-1 (flush)
Keying Plug on Carrier Strip
(10 per strip)



Part Number 640629-1 (flush)
Used with Keyed Headers



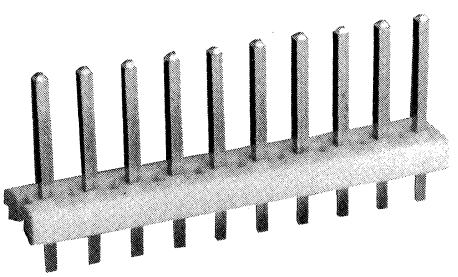
Part Number 640630-1 (long nose)
Used with Staked Posts



Straight Post Header Assemblies
(.045" Square and Round Posts)
.156" Centers

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers	
	Square Post	Round Post
2	640383-2	—
3	640383-3	—
4	640383-4	—
5	640383-5	—
6	640383-6	—
7	640383-7	—
8	640383-8	—
9	640383-9	640384-9
10	1-640383-0	—
12	1-640383-2	1-640384-2
14	1-640383-4	—
15	1-640383-5	—
18	1-640383-8	—
20	2-640383-0	—



Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

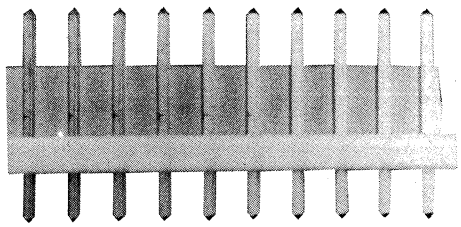
AMP Incorporated, Harrisburg, PA 17105

AMP

Polarized Straight Post Header Assemblies (.045″ Square and Round Posts) .156″ Centers

(Must be used with connectors without locking ramps)

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

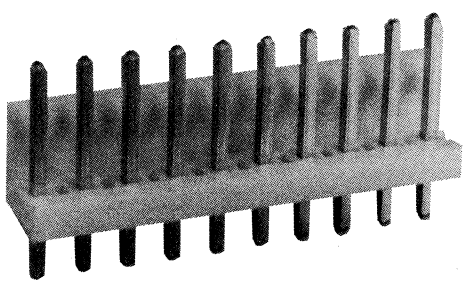


Number of Circuits	Part Numbers	
	Square Posts	Round Posts
2	640444-2	640386-2
3	640444-3	640386-3
4	640444-4	640386-4
5	640444-5	640386-5
6	640444-6	640386-6
7	640444-7	640386-7
8	640444-8	640386-8
9	640444-9	—
10	1-640444-0	1-640386-0
11	1-640444-1	—
12	1-640444-2	1-640386-2
13	1-640444-3	—
15	1-640444-5	—
16	1-640444-6	—
18	1-640444-8	—

Friction Lock Straight Post Header Assemblies (.045″ Square and Round Posts) .156″ Centers

(Must be used with connectors having locking ramps to be effective)

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated or gold plated
Tin
Gold[1] — .000015″ thick
Gold[2] — .000030″ thick



Number of Circuits	Part Numbers			
	Square Posts			Round Posts
	Tin plated	Gold[1]	Gold[2]	Tin plated
2	640445-2	641119-2	641208-2	640388-2
3	640445-3	—	641208-3	640388-3
4	640445-4	641119-4	641208-4	640388-4
5	640445-5	—	—	640388-5
6	640445-6	—	—	640388-6
7	640445-7	—	—	640388-7
8	640445-8	—	—	640388-8
9	640445-9	—	—	640388-9
10	1-640445-0	1-641119-0	—	1-640388-0
11	1-640445-1	—	—	1-640388-1
12	1-640445-2	—	—	1-640388-2
13	1-640445-3	—	—	—
14	1-640445-4	—	—	1-640388-4
15	1-640445-5	—	—	1-640388-5
17	1-640445-7	—	—	—
18	1-640445-8	—	—	—

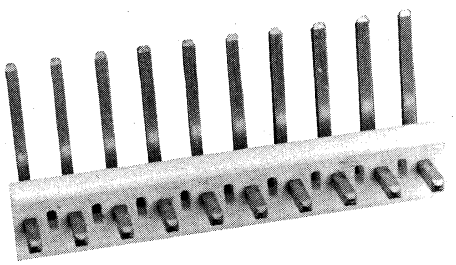
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

Right-Angle Post Header Assemblies (.045" Square Posts) .156" Centers

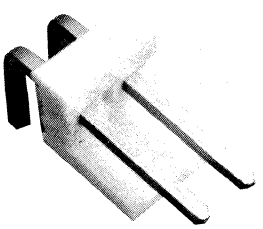


Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers
3	640385-3
4	640385-4
5	640385-5
6	640385-6
7	640385-7
8	640385-8
9	640385-9
10	1-640385-0
18	1-640385-8

Polarized Right-Angle Post Header Assemblies (.045" Square Posts) .156" Centers

(Must be used with connectors without locking ramps)



Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

Number of Circuits	Part Numbers
2	640387-2
3	640387-3
4	640387-4
5	640387-5
6	640387-6
7	640387-7
8	640387-8

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

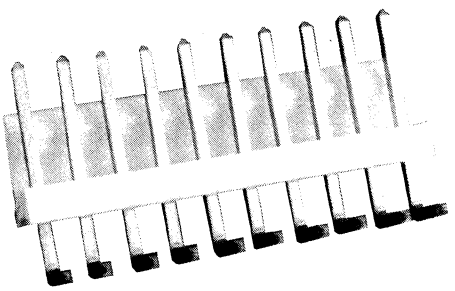
AMP Incorporated, Harrisburg, PA 17105

AMP

Friction-Lock Right-Angle Post Header Assemblies (.045″ Square Posts) .156″ Centers

(Must be used with connectors having locking ramps to be effective)

Material and Finish:
Housing — Thermoplastic, 94V-0 rated
Contacts — Copper alloy, tin plated

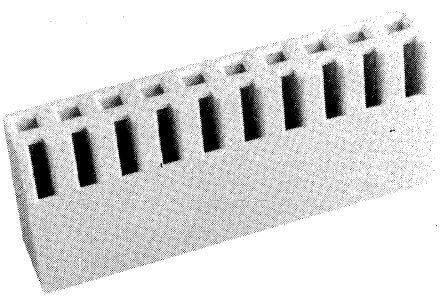


Number of Circuits	Part Numbers
2	640389-2
3	640389-3
4	640389-4
5	640389-5
6	640389-6
7	640389-7
8	640389-8
9	640389-9
10	1-640389-0
11	1-640389-1
12	1-640389-2
15	1-640389-5
16	1-640389-6
20	2-640389-0

Wire-to-Board Receptacle Housing Assemblies (SL) (With and without Locking Ramp) .156″ Centers

Material:
Thermoplastic, 94V-0 rated

Accepts contact **Part Number 640252** for 1 through 12 positions and contact **Part Number 350980** for 13 through 24 positions.



Number of Positions	Part Numbers	
	With Locking Ramp	Without Locking Ramp
1	—	640251-1
2	640250-2	640251-2
3	640250-3	640251-3
4	640250-4	640251-4
5	640250-5	640251-5
6	640250-6	640251-6
7	640250-7	640251-7
8	640250-8	640251-8
9	640250-9	640251-9
10	1-640250-0	1-640251-0
11	1-640250-1	1-640251-1
12	1-640250-2	1-640251-2
13	1-640250-3	1-640251-3
14	1-640250-4	1-640251-4
15	1-640250-5	1-640251-5
16	1-640250-6	1-640251-6
17	1-640250-7	—
18	1-640250-8	1-640251-8
19	—	1-640251-9
24	2-640250-4	—

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

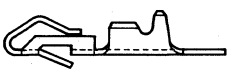
AMP

.100" and .156" Centerline Mass-Terminated Discrete Wire/Ribbon Cable Connector Assemblies (MTA)

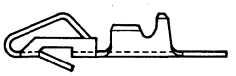
Contacts (SL)
.156" Centers

24-18 AWG wire range
.100" insulation diameter
.012" stock thickness

Contact	Material and Finish	Part Numbers	
		Strip	Loose Piece
High Force	Brass, bright tin plated	640252-1	640706-1
	Pre-tin brass	640252-2	—
Low Force	Brass, bright tin plated	350980-1	640707-1
	Pre-tin brass	350980-2	—
	Gold	350980-3	770258-1



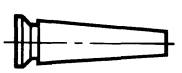
High Force



Low Force

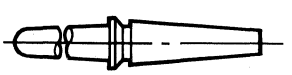
Keying Plug (SL)
.156" Centers

Part Number 640254-1



Keying Pin (SL)
.156" Centers

Part Number 640255-1



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AMP Incorporated, Harrisburg, PA 17105

AMP

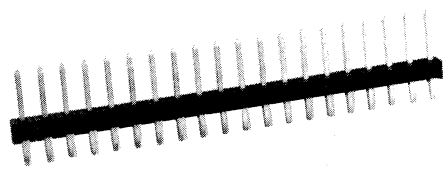
.025" Square Posts, Headers and Receptacles (AMPMODU)

- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476
- CSA Certified, File No. LR-16455

Straight Header Assemblies, Breakaway — Unshrouded Single Row (.025" x .025" Post) .100" Centers

Material and Finish:

Housing — Thermoplastic, black
Contacts — Copper alloy, plated as follows:
Duplex — .000015" gold on mating area, .000100"-.000200" matte tin-lead on solder area, with entire post underplated .000050" nickel
Tin — .000100"-.000200" bright tin-lead over .000050" nickel



Number of Positions	Part Numbers Solder Tail = .120" Mating Length = .230"	
	Duplex	Tin
1	103185-1	103327-1
2	103185-2	103327-2
3	103185-3	103327-3
4	103185-4	103327-4
5	103185-5	103327-5
6	103185-6	103327-6
7	103185-7	103327-7
8	103185-8	103327-8
9	103185-9	103327-9
10	1-103185-0	1-103327-0
11	1-103185-1	1-103327-1
12	1-103185-2	1-103327-2
13	1-103185-3	1-103327-3
14	1-103185-4	1-103327-4
15	1-103185-5	1-103327-5
20	2-103185-0	2-103327-0
25	2-103185-5	2-103327-5
30	3-103185-0	3-103327-0
35	3-103185-5	3-103327-5
40	4-103185-0	4-103327-0

AMPMODU—Trademark of AMP Incorporated

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

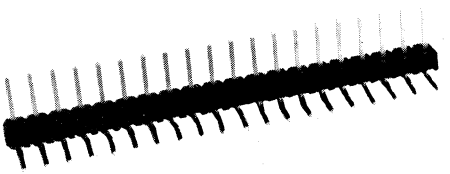
.025" Square Posts, Headers and Receptacles (AMPMODU)

Right-Angle Header Assemblies, Breakaway — Unshrouded
Single Row
(.025" x .025" Post)
.100" Centers

Material and Finish:

Housing — Thermoplastic, black
Contacts — Copper alloy, plated as follows:
Duplex — .000015" gold on mating area, .000100"-.000200" matte tin-lead on solder area, with entire post underplated .000050" nickel
Tin — .000100"-.000200" bright tin-lead over .000050" nickel

Number of Positions	Part Numbers Solder Tail = .120" Mating Length = .230"	
	Duplex	Tin
1	103325-1	103329-1
2	103325-2	103329-2
3	103325-3	103329-3
4	103325-4	103329-4
5	103325-5	103329-5
6	103325-6	103329-6
7	103325-7	103329-7
8	103325-8	103329-8
9	103325-9	103329-9
10	1-103325-0	1-103329-0
11	1-103325-1	1-103329-1
12	1-103325-2	1-103329-2
13	1-103325-3	1-103329-3
14	1-103325-4	1-103329-4
15	1-103325-5	1-103329-5
20	2-103325-0	2-103329-0
25	2-103325-5	2-103329-5
30	3-103325-0	3-103329-0
35	3-103325-5	3-103329-5
40	4-103325-0	4-103329-0



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AMP Incorporated, Harrisburg, PA 17105

AMP

Straight Header Assemblies, Breakaway — Unshrouded Double Row (.025″ x .025″ Straight Post) .100″ Centers

Material and Finish:

Housing — Thermoplastic, black
Contacts — Copper alloy, plated as follows:
Duplex — .000015″ gold on mating area, .000100″-.000200″ matte tin-lead on solder area, with entire post underplated .000050″ nickel
Tin — .000100″-.000200″ bright tin-lead over .000050″ nickel

Number of Positions	Part Numbers Solder Tail = .120″ Mating Length = .230″	
	Duplex	Tin
2	103186-1	103328-1
4	103186-2	103328-2
6	103186-3	103328-3
8	103186-4	103328-4
10	103186-5	103328-5
12	103186-6	103328-6
14	103186-7	103328-7
16	103186-8	103328-8
18	103186-9	103328-9
20	1-103186-0	1-103328-0
22	1-103186-1	1-103328-1
24	1-103186-2	1-103328-2
26	1-103186-3	1-103328-3
30	1-103186-5	1-103328-5
34	1-103186-7	1-103328-7
40	2-103186-0	2-103328-0
50	2-103186-5	2-103328-5
60	3-103186-0	3-103328-0
70	3-103186-5	3-103328-5
80	4-103186-0	4-103328-0

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

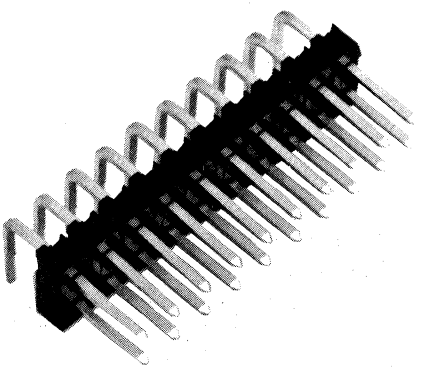
AMP

.025" Square Posts, Headers and Receptacles (AMPMODU)

Right-Angle Header Assemblies, Breakaway — Unshrouded Double Row (.025" x .025" Post) .100" Centers

Material and Finish:
Housing — Thermoplastic, black
Contacts — Copper alloy, plated as follows:
Duplex — .000015" gold on mating area, .000100"-.000200" matte tin-lead on solder area, with entire post underplated .000050" nickel
Tin — .000100"-.000200" bright tin-lead over .000050" nickel

Number of Positions	Part Numbers	
	Solder Tail = .120" Mating Length = .230"	
	Duplex	Tin
2	103326-1	103330-1
4	103326-2	103330-2
6	103326-3	103330-3
8	103326-4	103330-4
10	103326-5	103330-5
12	103326-6	103330-6
14	103326-7	103330-7
16	103326-8	103330-8
18	103326-9	103330-9
20	1-103326-0	1-103330-0
22	1-103326-1	1-103330-1
24	1-103326-2	1-103330-2
26	1-103326-3	1-103330-3
30	1-103326-5	1-103330-5
34	1-103326-7	1-103330-7
40	2-103326-0	2-103330-0
50	2-103326-5	2-103330-5
60	3-103326-0	3-103330-0
70	3-103326-5	3-103330-5
80	4-103326-0	4-103330-0



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AMP Incorporated, Harrisburg, PA 17105

AMP

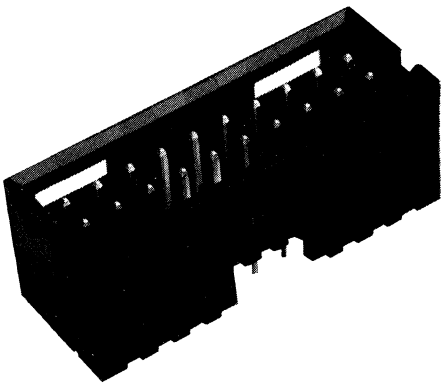
Straight Header Assemblies — Shrouded Double Row With Pin Protection and Detent Windows (.025″ x .025″ Posts) .100″ Centers

Mates with polarized and non-polarized AMPMODU Connectors **(.066″ end dimension)**

Material and Finish:

Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030″ gold on mating area, .000100″-.000200″ matte tin/lead on solder area, with entire post underplated .000050″ nickel

Number of Positions	Part Numbers
10	103168-3
20	103168-8
26	1-103168-1
34	1-103168-5
40	1-103168-8
50	2-103168-3



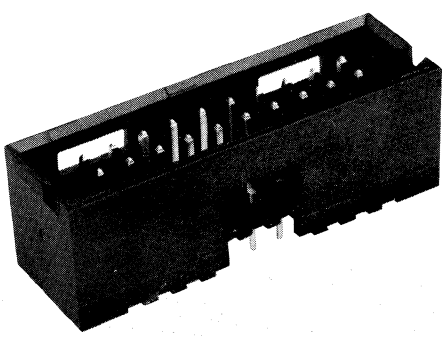
Straight Header Assemblies — Shrouded Double Row With Pin Protection and Detent Windows (.025″ x .025″ Posts) .100″ Centers

Mates with polarized AMPMODU Connectors **(.150″ end dimension)**

Material and Finish:

Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030″ gold on mating area, .000100″-.000200″ matte tin/lead on solder area, with entire post underplated .000050″ nickel

Number of Positions	Part Numbers
10	103169-3
20	103169-8
26	1-103169-1
34	1-103169-5
40	1-103169-8
50	2-103169-3



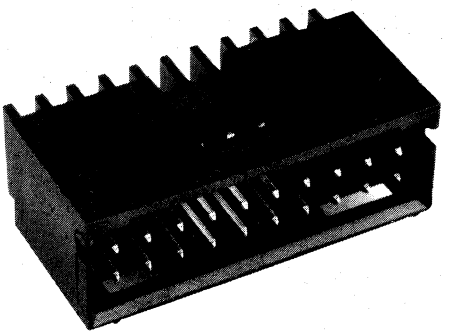
.025" Square Posts, Headers and Receptacles (AMPMODU)

Right-Angle Header Assemblies — Shrouded Double Row With Pin Protection (4 Sides) and Detent Windows (.025" x .025" Posts) .100" Centers

Mates with polarized and non-polarized AMPMODU Connectors **(.066" end dimension)**

Material and Finish:
Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030" gold on mating area, .000100"-.000200" matte tin/lead on solder area, with entire post underplated .000050" nickel

Number of Positions	Part Numbers
10	103166-3
20	103166-8
26	1-103166-1
34	1-103166-5
40	1-103166-8
50	2-103166-3

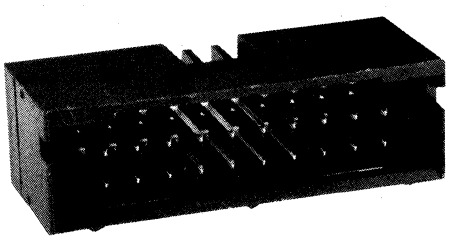


Right-Angle Header Assemblies — Shrouded Double Row With Pin Protection (4 Sides) and Detent Windows (.025" x .025" Posts) .100" Centers

Mates with polarized AMPMODU Connectors **(.150" end dimension)**

Material and Finish:
Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030" gold on mating area, .000100"-.000200" matte tin/lead on solder area, with entire post underplated .000050" nickel

Number of Positions	Part Numbers
10	103167-2
20	103167-7
26	1-103167-0
34	1-103167-4
40	1-103167-7
50	2-103167-2



AMPMODU—Trademark of AMP Incorporated

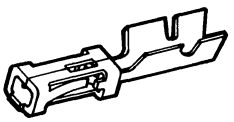
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

.025″ Square Receptacle Contacts

Wire Crimp Receptacle
With Insulation Support, Snap-In



Plating:

Duplex[1] — .000015″ gold in contact area, tin plated in crimp area, with entire contact underplated .000050″ nickel

Duplex[2] — .000030″ gold in contact area, tin plated in crimp area, with entire contact underplated .000050″ nickel

Select Gold — .000030″ gold in contact area, with gold flash over .000050″ nickel on entire contact

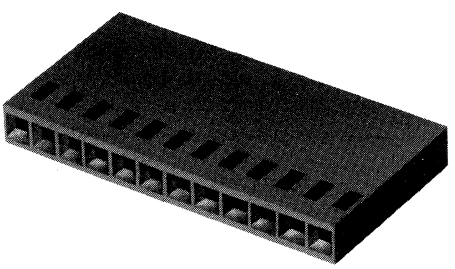
Tin — Bright tin .000100″-.000200″ over nickel .000030″

Wire Size Range (AWG)	Insul. Dia. (Max.)	Contact Length	Plating	Part Numbers					
				Standard Pressure		Intermediate Pressure		High Pressure	
				Strip Form	Loose Piece	Strip Form	Loose Piece	Strip Form	Loose Piece
32-27	.040	.445	Duplex[1]	102316-6	—	—	—	—	—
	.040	.445	Select Gold	102917-1	102917-2	102918-1	—	—	—
26-22	.061	.445	Duplex[2]	1-87756-7	1-87756-8	103171-4	103171-5	—	—
	.061	.445	Tin	—	—	—	—	87809-2	—
	.061	.445	Select Gold	—	—	—	—	87809-1	102128-1
24-20	.069	.470	Duplex[2]	1-87523-8	1-87523-9	1-87195-7	—	—	—
	.069	.470	Tin	—	—	—	—	87309-8	—
	.069	.470	Select Gold	85969-8	86016-2	86492-6	87046-3	87309-9	1-87309-4

Keying Plugs
Part Numbers 87077-1
(for .645″ Housings)
and 87077-2
(for .600″ Housings)
(Plug directly into Housing)

Housings — Wire Applied, Single and Double Row (For Crimp Snap-In Receptacle Contacts) .100″ Centers

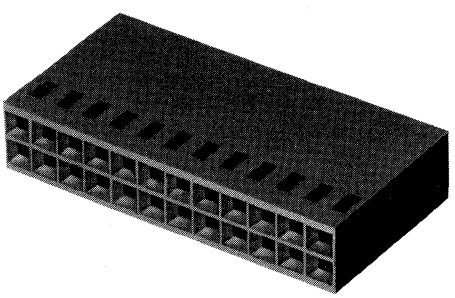
Non-Polarized
(Without Strain Relief/Pull Tab)



Material:

Thermoplastic, flame-retardant, black

Number of Positions	Part Numbers			
	Single Row		Double Row	
	Stamped*	Unstamped	Stamped*	Unstamped
1	7-87499-1	7-87499-2	—	—
2	87499-3	87499-4	—	5-87456-3
3	87499-5	87499-6	—	—
4	87499-7	87499-8	5-87456-0	4-87456-9
5	87499-9	1-87499-0	—	—
6	1-87499-1	1-87499-2	87456-2	87456-1
8	1-87499-3	1-87499-4	87456-4	87456-3
10	1-87499-7	1-87499-8	87456-6	87456-5
12	2-87499-1	2-87499-2	87456-8	—
14	—	—	1-87456-0	87456-9
16	—	—	1-87456-2	1-87456-1
20	—	—	1-87456-6	1-87456-5
26	—	—	2-87456-2	2-87456-1
34	—	—	3-87456-0	2-87456-9
50	—	—	4-87456-0	3-87456-9



*Cavity identification, AMP, part number and date code stamped on housing and/or strain relief where size permits.

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

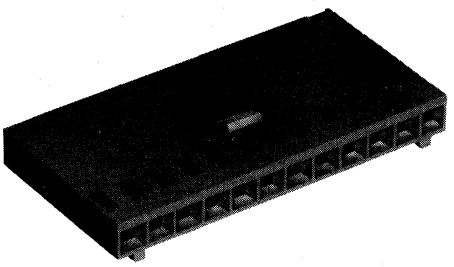
AMP Incorporated, Harrisburg, PA 17105

AMP

.025" Square Posts, Headers and Receptacles (AMPMODU)

Housings — Wire Applied, Single and Double Row (For Crimp Snap-In Receptacle Contacts) .100" Centers

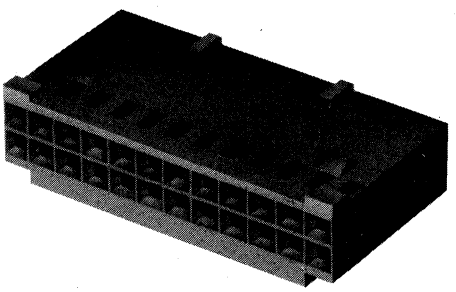
Polarized With Detent Latching (Without Strain Relief/Pull Tab)



Material:
Thermoplastic, flame-retardant, black

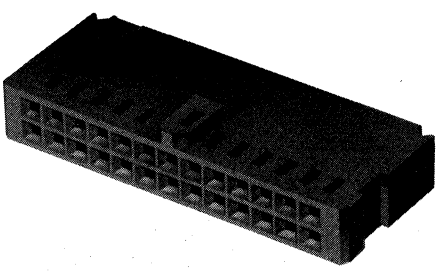
Number of Positions	Single Row Part Numbers	Number of Detents	Double Row Part Numbers Without Strain Relief	
	Unstamped[1]		Stamped[2]	Unstamped[1]
3	102241-1	—	—	—
4	102241-2	—	—	—
5	102241-3	—	—	—
6	102241-4	1	87631-2	87631-1
7	102241-5	—	—	—
8	102241-6	1	87631-4	87631-3
10	102241-8	1	87631-6	87631-5
12	1-102241-0	1	87631-8	87631-7
14	1-102241-2	1	1-87631-0	87631-9
16	—	1	1-87631-2	1-87631-1
20	—	2	1-87631-6	1-87631-5
24	—	2	2-87631-0	1-87631-9
28	—	2	—	2-87631-3
34	—	2	—	2-87631-9
40	—	2	—	3-87631-5
50	—	2	4-87631-2	4-87631-1
60	—	2	—	5-87631-1

[1]No marking on housings.
[2]Cavity identification, AMP, Part Number and date code stamped on housing where size permits.



Housings — Wire Applied, Double Row (For Crimp Snap-In Receptacle Contacts) .100" Centers

Center Polarized
(Mate with AMP-LATCH Universal Ejection Headers and AMPMODU Low Profile Latching Headers — .576" Eject Latches)



Material:
Thermoplastic, flame-retardant, black

Number of Positions	Part Numbers (Stamped)*
10	102387-1
14	102387-2
16	102387-3
20	102387-4
24	102387-5
26	102387-6
34	102387-8
40	102387-9
50	1-102387-0
60	1-102387-1

*Cavity identification - AMP part number and date code stamped on housing where size permits.

AMP, AMP-LATCH, AMPMODU—Trademark of AMP Incorporated

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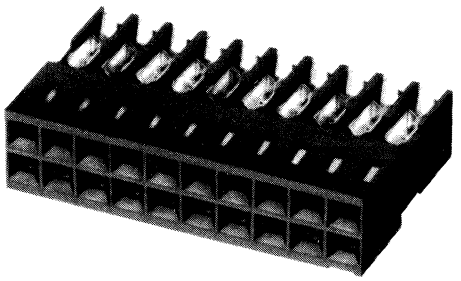
AMP Incorporated, Harrisburg, PA 17105

AMP

Double Row MT Receptacle Connectors .100″ Centers



Housings Preloaded with Standard-Pressure Contacts
Insulation Diameter: .050″ maximum
Mating Post Length: .222″-.273″ maximum

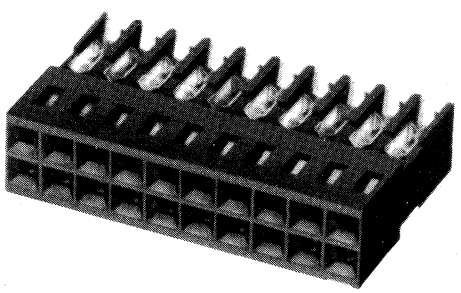
Material and Finish:

Housing and Cover — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030″ gold on mating end, bright tin-lead on termination end, with entire contact underplated .000030″ nickel

Number of Positions	Part Numbers		
	30-26 AWG	26-22 AWG	22-20 AWG
6	102393-1	102398-1	—
8	102393-2	102398-2	—
10	102393-3	102398-3	—
12	102393-4	102398-4	—
14	102393-5	102398-5	102448-5
16	102393-6	102398-6	102448-6
18	102393-7	102398-7	102448-7
20	102393-8	102398-8	102448-8
26	1-102393-1	1-102398-1	1-102448-1
34	1-102393-5	1-102398-5	—
40	1-102393-8	1-102398-8	1-102448-8
50	2-102393-3	2-102398-3	2-102448-3
60	2-102393-8	2-102398-8	—

Note: Cavity identification, AMP, part number and date code stamped on housing and/or strain relief where size permits-white ink stamping for 26-22 AWG.

Double Row MT Receptacle Connectors .100″ Centers



Housings Preloaded with High-Pressure Contacts
Insulation Diameter: .050″ maximum
Mating Post Length: .200″-.273″ maximum

Material and Finish:

Housing and Cover — Thermoplastic, flame-retardant, black
Contacts — Copper alloy

Numbers of Positions	Part Numbers (Stamped)* 26-22 AWG wire
6	102694-1
8	102694-2
10	102694-3
16	102694-6
20	102694-8

*Cavity identification - every fifth cavity (one side) - AMP, part number and date code stamped on housing where size permits - white ink stamped for 26-22 AWG.

AMP—Trademark of AMP Incorporated

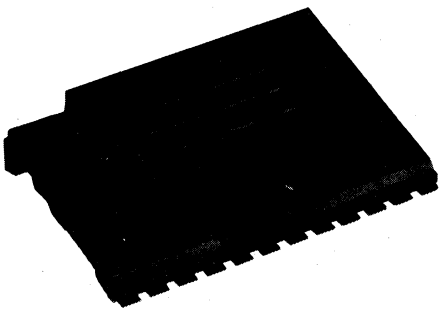
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

.025" Square Posts, Headers and Receptacles (AMPMODU)

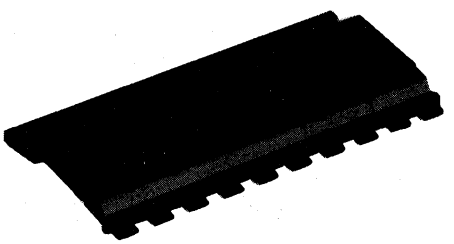
Standard Profile (Hermaphroditic) Covers For Double-Row MT Receptacle Connectors .100" Centers



Material:
Thermoplastic, flame-retardant, black

Number of Positions	Part Numbers
6	102396-1
8	102396-2
10	102396-3
12	102396-4
14	102396-5
16	102396-6
20	102396-8
26	1-102396-1
34	1-102396-5
50	2-102396-3

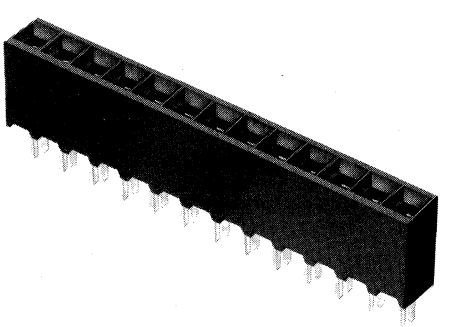
Low Profile Covers for Double Row MT Receptacle Connectors .100" Centers



Material:
Thermoplastic, flame-retardant, black

Number of Positions	Cover Part Numbers		
	Polarizing	Non-Polarizing	Back
6	102540-1	102541-1	102536-1
8	102540-2	102541-2	102536-2
10	102540-3	102541-3	102536-3
12	102540-4	102541-4	102536-4
14	—	102541-5	102536-5
16	102540-6	102541-6	102536-6
18	—	102541-7	102536-7
20	102540-8	102541-8	102536-8
26	—	1-102541-1	1-102536-1
34	—	1-102541-5	1-102536-5
40	—	1-102541-8	1-102536-8
50	—	2-102541-3	2-102536-3
60	—	2-102541-8	2-102536-8

Receptacle Assemblies — Single Row, Low Profile, Top Entry .100" Centers (Mates with .025" Square or Round Posts)



Material and Finish:
Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, selectively plated .000030" gold on contact area, with gold flash over .000050" nickel on entire contact

Number of Positions	Part Numbers
6	87334-1
18	87334-7
20	87334-8

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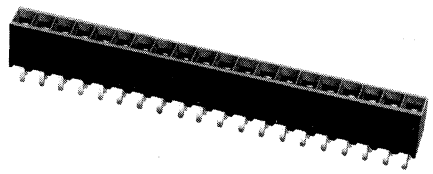
AMP Incorporated, Harrisburg, PA 17105

AMP

Receptacle Assemblies — Single Row, Low Profile, Bottom Entry .100″ Centers (Mates with .025″ Square or Round Posts)

Material and Finish:

Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, selectively plated .000030″ gold on contact area, with gold flash over .000050″ nickel on entire contact

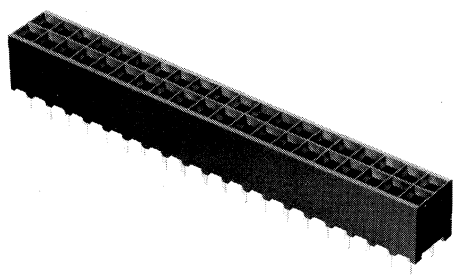


Number of Positions	Part Numbers
9	87879-5
10	87879-2

Receptacle Assemblies — Double Row, Low Profile, Top Entry .150″ Row-to-Row Board Mounting .100″ Centers (Mates with .025″ Square or Round Posts)

Material and Finish:

Housing and Cover — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030″ gold on contact area, .000100″-.000200″ bright tin/lead on solder area, with entire post underplated .000050″ nickel

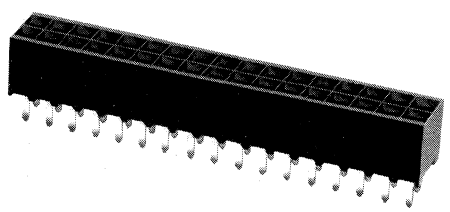


Number of Positions	Part Numbers
10	103183-4
40	1-103183-6
50	1-103183-7
60	1-103183-8

Receptacle Assemblies — Double Row, Low Profile, Top Entry .100″ Row-to-Row Board Mounting .100″ Centers (Mates with .025″ Square or Round Posts)

Material and Finish:

Housing — Thermoplastic, flame-retardant, black
Contacts — Copper alloy, duplex plated .000030″ gold on contact area, .000100″-.00200″ bright tin/lead on solder area, with entire post underplated .000050″ nickel



Number of Positions	Part Numbers
10	534998-5
20	1-534998-0
30	1-534998-5
40	2-534998-0
50	2-534998-5
60	3-534998-0

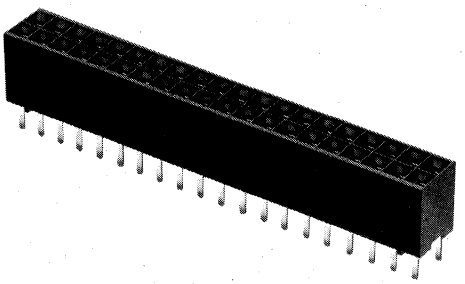
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

.025" Square Posts, Headers and Receptacles (AMPMODU)

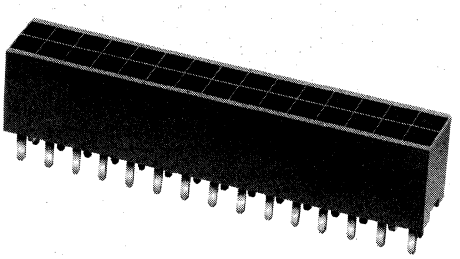
Receptacle Assemblies — Double Row, Top Entry .150" Row-to-Row Board Mounting .100" Centers (Mates with .025" Square or Round Posts)



Material and Finish:
Housing — Thermoplastic, flame-retardant, brown
Contacts — Copper alloy, selectively plated .000030" gold on contact area, gold flash on remainder of contact with .000050" nickel underplate

Number of Positions	Part Numbers
34	1-86418-8
50	102916-1

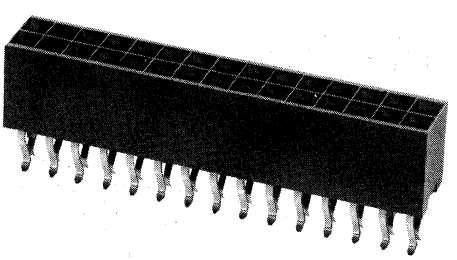
Receptacle Assemblies — Double Row, Top Entry .100" Row-to-Row Board Mounting .100" Centers (Mates with .025" Square or Round Posts)



Material and Finish:
Housing — Thermoplastic, flame-retardant, brown
Contacts — Copper alloy, plated as follows:
Duplex[1] — .000030" gold on contact area, .000100"-.000200" bright tin/lead on solder area, with entire contact underplated .000050" nickel
Duplex[2] — .000015" gold on contact area, .000100"-.000200" bright tin/lead on solder area, with entire contact underplated .000050" nickel

Number of Positions	Part Numbers	
	Duplex[1]	Duplex[2]
24	1-534206-2	—
28	1-534206-4	—
32	1-534206-6	2-103256-3
40	2-534206-0	—
50	2-534206-5	—
60	3-534206-0	—

Receptacle Assemblies — Double Row, Vertical Pc Board Edge Mount, End Stackable .100" Centers (Mates with .025" Square or Round Posts)



Material and Finish:
Housing — Thermoplastic, flame-retardant, brown
Contacts — Copper alloy, selectively plated .000030" gold on contact area, gold flash over .000050" nickel on entire contact
Part Number 87331-8 (50-Position)

AMPMODU—Trademark of AMP Incorporated

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

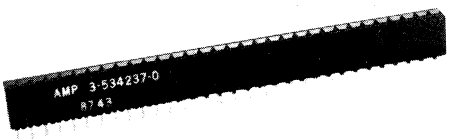
AMP

Receptacle Assemblies — Single Row, Closed Entry .100″ Centers (Mates with .025″ Square or Round Posts)

Material and Finish:

Housing — Thermoplastic, flame-retardant, black
Contacts — Phosphor bronze, duplex plated .000030″ gold in contact area, .000050″-.000100″ bright tin/lead on tines, all over .000050″ nickel

Number of Positions	Part Numbers
5	534237-3
10	534237-8
15	1-534237-3
20	1-534237-8
25	2-534237-3
30	2-534237-8
32	3-534237-0



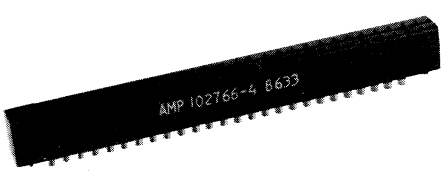
Receptacle Assemblies — Double Row, Top Entry, High Profile, Selectively Loaded (with Standoffs), .100″ Centers, Stacking (Mates with .025″ Square or Round Posts)

Material and Finish:

Housing — Thermoplastic, flame-retardant, brown
Contacts — Phosphor bronze, duplex plated .000015″ gold on mating area, .000050″ bright tin/lead on solder area, with entire contact underplated .000050″ nickel

Number of Positions	Part Numbers
60* (52 Active)	102766-4

*In addition to the active positions, each receptacle has four cavities on each end that are not loaded with contacts. These empty cavities aid in aligning the receptacle with header posts during mating.



Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

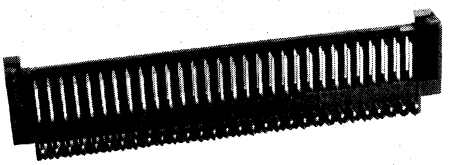
AMP Incorporated, Harrisburg, PA 17105

.025" Square Posts, Headers and Receptacles (AMPMODU)

Two-Piece Right-Angle Header Assemblies—Board-to-Board (.025" Square Solder Post, Card Extender) (With Pin Protection and Guide Pins)

Material and Finish:

Housing — Thermoplastic, flame-retardant
Contacts — Phosphor bronze, plated as follows:
Duplex[1] — .000015" gold on mating end, .000100"-.000200" bright tin/lead on solder tail, with entire contact underplated .000050" nickel
Duplex[2] — .000030" gold on mating end, .000100"-.000200" bright tin/lead on solder tail, with entire contact underplated .000050" nickel



Number of Positions	Part Numbers	
	Duplex[1]	Duplex[2]
50	102589-5	534245-1*
60	102589-7	—
72	1-102589-7	—
80	—	102802-5
100	—	102802-6
120	—	102802-2
130	—	1-102802-9

*Board Retention Feature

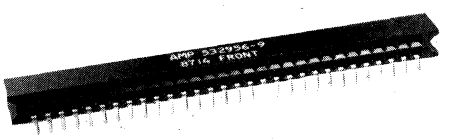
Two-Piece Receptacle Assemblies—Closed Entry, Board Mounted, Board-to-Board .100" Centers

Horizontal Mount
(with Guide Pin Slots and Standoffs)

Material and Finish:

Housing — Polyphenylene Sulfide
Contacts — Phosphor bronze, plated as follows:
Duplex[1] — .000015" gold on mating end, .000050"-.000100" bright tin/lead on solder tail, with entire contact underplated .000050" nickel
Duplex[2] — .000030" gold on mating end, .000050"-.000100" bright tin/lead on solder tail, with entire contact underplated .000050" nickel

.115" solder tail



Number of Positions	Part Numbers	
	Duplex[1]	Duplex[2]
50	532955-8	534204-1*
60	—	532956-9
70	—	1-532956-0
80	—	1-532956-2
100	—	1-532956-6
120	—	1-532956-8
130	—	2-532956-0

*Board Retention Feature

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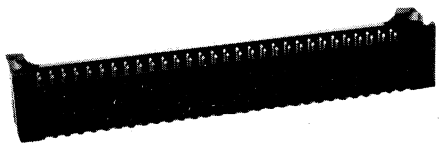
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Two-Piece Straight Header Assemblies, Board-to-Board (.025″ Square Solder Post and ACTION PIN contacts) (With Pin Protection and Guide Pins) .100″ Centers



Material and Finish:

Housing — Thermoplastic, flame-retardant
Contacts — Phosphor bronze, plated as follows:
Duplex[1] — .000015″ gold on mating end, .000100″-.000200″ bright tin/lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — .000030″ gold on mating end, .000100″-.000200″ bright tin/lead on termination end, with entire contact underplated .000050″ nickel
Select Gold — flash over .000050″ nickel on entire contact, with additional .000030″ gold on mating end and .000015″ gold on termination end

Number of Positions	Part Numbers			
	with .180″ Solder Posts		with ACTION PIN Posts	
	Duplex[1]	Duplex[2]	Duplex[2]	Select Gold
50	102567-6	102692-4	—	—
60	—	102692-5	—	—
70	—	1-102692-4	—	—
80	—	533023-1*	102690-6	—
100	102567-9	—	102690-8	—
110	1-102567-5	—	—	—
120	102567-7	102692-9	—	1-102666-1

*With .120″ solder tail

ACTION PIN—Trademark of AMP Incorporated

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

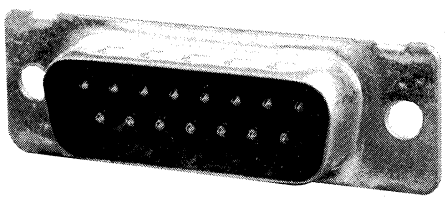
Subminiature D Connectors (AMPLIMITE)

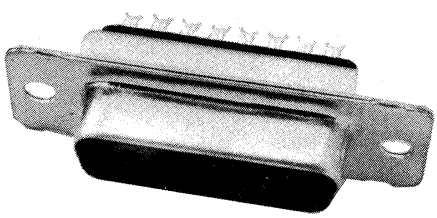
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476
- CSA Certified, File No. LR 16455

HDP-20 Metal-Shell Connectors With Preloaded Solder Cup Contacts (Nonremovable)

Material and Finish:

Connector Shells — Steel, tin plated
Connector Insert — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated with gold flash on mating end, .000150″-.000300″ tin-lead on solder cup, with entire contact underplated .000030″ nickel





Plugs

Number of Contact Positions (Shell Size)	Part Numbers
9 (1)	747904-2
15 (2)	747908-2
25 (3)	747912-2
37 (4)	747916-2

Receptacles

Number of Contact Positions (Shell Size)	Part Numbers
9 (1)	747905-2
15 (2)	747909-2
25 (3)	747913-2
37 (4)	747917-2

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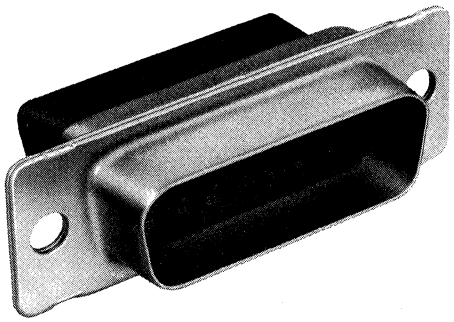
AMP Incorporated, Harrisburg, PA 17105

AMP

HDP-20 Metal-Shell Connectors For Snap-In Contacts

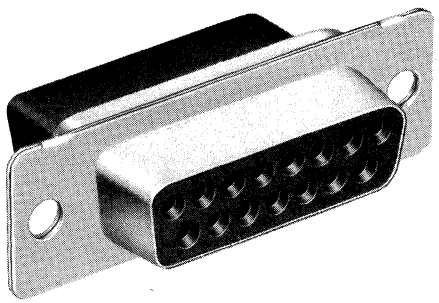


Material and Finish:

Shell — Steel, zinc (yellow chromate) or tin plated
Insert — Thermoplastic, 94V-0 rated, black

Plugs — Standard

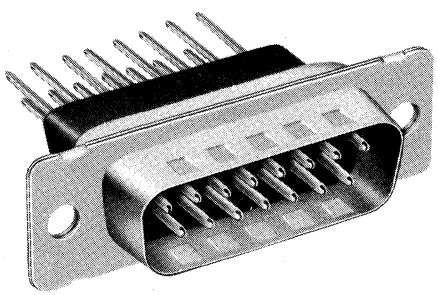
Number of Contact Positions (Shell Size)	Part Numbers	
	Zinc-Plated Shell	Tin-Plated Shell With Grounding Indents
9 (1)	205204-1	205204-4
15 (2)	205206-1	205206-3
25 (3)	205208-1	207464-2
37 (4)	205210-1	205210-3
50 (5)	205212-1	205212-3



Receptacles — Standard

Number of Contact Positions (Shell Size)	Part Numbers	
	Zinc-Plated Shell	Tin-Plated Shell
9 (1)	205203-1	205203-3
15 (2)	205205-1	205205-2
25 (3)	205207-1	207463-1
37 (4)	205209-1	205209-2
50 (5)	205211-1	205211-2

HDP-20 Metal-Shell Connectors With .025″ Square Straight Posted Contacts (For Pc Board Mounting or Wrap-Type Terminations)



Plug Assemblies

Without Grounding Indents, Zinc- or Tin-Plated Shell
With Grounding Indents, Tin-Plated Shell Only

Material and Finish:

Shell — Steel, zinc (yellow chromate) or tin plated
Insert — Thermoplastic, 94V-0 rated, black
Pin Contacts (posted) — Brass, plated as follows:
Select Gold — Gold flash over .000050″ nickel on entire contact, with additional .000030″ gold on mating end for length of .150″ minimum
Gold — Gold flash over .000030″ nickel

Number of Contact Positions (Shell Size)	Part Numbers				
	Zinc-Plated Shell Select Gold	Tin-Plated Shell			
		Without Grounding Indents		With Grounding Indents	
		Select Gold	Gold	Select Gold	Gold
9 (1)	—	—	—	745410-1	745410-2
15 (2)	—	—	—	745411-1	745411-2
25 (3)	205737-1	—	—	745412-1	745412-2
37 (4)	—	745188-1	745188-2	745413-1	745413-2
50 (5)	—	—	—	745414-1	745414-2

Note: All plug assemblies are preloaded with size 20 DF posted pin contacts.

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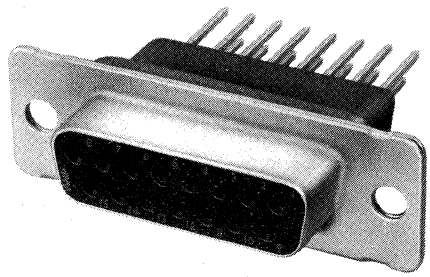
AMP Incorporated, Harrisburg, PA 17105

AMP

Subminiature D Connectors (AMPLIMITE)

HDP-20 Metal-Shell Connectors With .025″ Square Straight Posted Contacts (For Pc Board Mounting or Wrap-Type Terminations)

Receptacle Assemblies With Tin-Plated Shell



Material and Finish:

Shell — Steel, tin plated
Insert — Thermoplastic, 94V-0 rated, black
Socket Contacts (posted) — Phosphor bronze, plated as follows:
Select Gold — Gold flash over .000050″ nickel on entire contact, with additional .000030″ gold on mating end for length of .150″ minimum
Gold — Gold flash over .000030″ nickel

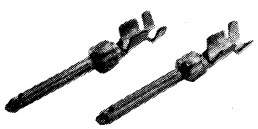
Number of Contact Positions (Shell Size)	Part Numbers	
	With Standard Mounting Holes	
	Select Gold	Gold
9 (1)	745183-1	745183-2
15 (2)	745185-1	745185-2
25 (3)	745187-1	745187-2
37 (4)	745189-1	745189-2

Note: All receptacle assemblies are preloaded with size 20 DF posted socket contacts.

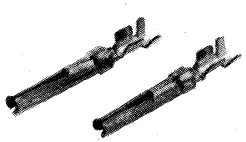
HD-20 Connector Contacts, Precision Formed (with Insulation Support)

Material and Finish:

Pin — Brass
Socket — Phosphor bronze
Duplex[1] — Gold flash on mating end for a length of .100″ minimum (socket), .150″ minimum (pin); tin-plated termination end; entire contact underplated with .000030″ nickel
Duplex[2] — Gold plated .000030″ thick on mating end for a length of .100″ minimum (socket), .150″ minimum (pin); tin-plated termination end; entire contact underplated with .000050″ nickel
Select Gold — Plated gold flash over .000050″ nickel on entire contact, with additional .000030″ gold on mating end for a length of .100″ minimum (socket), .150″ minimum (pin)
Gold Flash — Plated gold flash over .000030″ nickel on entire contact



Pin



Socket

Wire Size Range (AWG)	Insulation Diameter (Maximum)	Contact Plating	Part Numbers				Color Code (Loose Piece)
			Strip Form		Loose Piece		
			Pin	Socket	Pin	Socket	
24-20	.060	Duplex[1]	2-66506-5	5-66504-6	5-66506-9	5-66504-7	Red
		Duplex[2]	2-66506-4	5-66504-9	5-66506-7	6-66504-0	
		Select Gold	66506-3	66504-3	66506-9	66504-9	
		Gold Flash	66506-4	66504-4	1-66506-0	1-66504-0	
28-24	.040	Duplex[1]	3-66507-1	5-66505-7	5-66507-9	5-66505-9	Blue
		Duplex[2]	3-66507-0	6-66505-0	5-66507-7	6-66505-2	
		Select Gold	66507-3	66505-3	66507-9	66505-9	
		Gold Flash	66507-4	66505-4	1-66507-0	1-66505-0	

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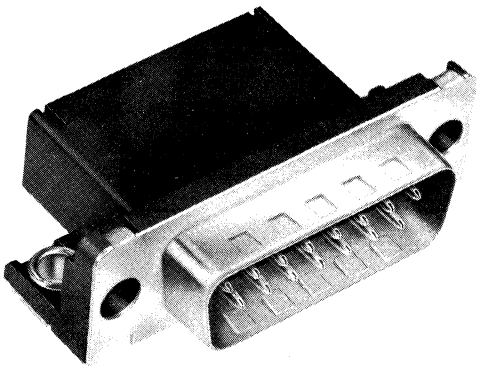
AMP Incorporated, Harrisburg, PA 17105

AMP

HDP-20 Metal-Shell Connectors With .026″ Diameter Right-Angle Posted Contacts 590 Mount (For Pc Board Mounting)



Plug Assemblies

Short Mounting Flange, With Grounding Indents and Threaded Inserts

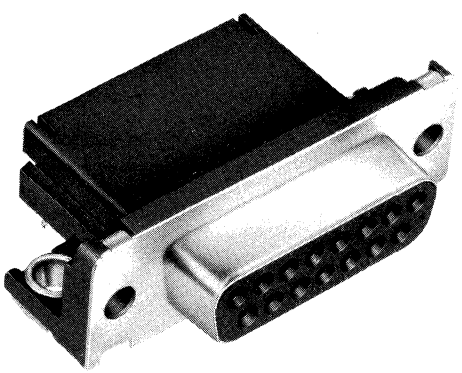
Material and Finish:

Front Shell — Steel, tin plated
Housing — Thermoplastic, 94V-0 rated, black
Eyelets — Brass, tin plated
Threaded Inserts — Brass, unplated
Female Screwlocks — Brass, nickel plated
Pin Contacts (posted) — Brass, duplex plated as follows:
Duplex[1] — .000030″ gold on mating end for length of .150″ minimum .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — Gold flash on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Contact Positions (Shell Size)	Plug Assembly Part Number (With Grounding Straps)	
	Duplex[1]	Duplex[2]
9 (1)	745990-4	745990-3
15 (2)	745986-4	745986-3
25 (3)	745994-4	745994-3
37 (4)	745998-4	745998-3

Note: All plug assemblies are preloaded with size 20 DF posted pin contacts.

HDP-20 Metal-Shell Connectors With .026″ Diameter Right-Angle Posted Contacts 590 Mount (For Pc Board Mounting)



Receptacle Assemblies

Short Mounting Flange, With Threaded Inserts

Material and Finish:

Front Shell — Steel, tin plated
Housing — Thermoplastic, 94V-0 rated, black
Eyelets — Brass, tin plated
Threaded Inserts — Brass, unplated
Female Screwlocks — Brass, nickel plated
Socket Contacts (posted) — Phosphor bronze, duplex plated as follows:
Duplex[1] — .000030″ gold on mating end for length of .100″ minimum .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — Gold flash on mating end for length of .100″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Contact Positions (Shell Size)	Receptacle Assembly Part Number (With Grounding Straps)	
	Duplex[1]	Duplex[2]
9 (1)	745988-4	745988-3
15 (2)	745984-4	745984-3
25 (3)	745992-4	745992-3
37 (4)	745996-4	745996-3

Note: All receptacle assemblies are preloaded with size 20 DF posted socket contacts.

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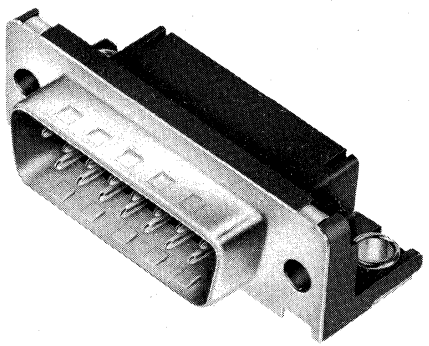
AMP Incorporated, Harrisburg, PA 17105

AMP

Subminiature D Connectors (AMPLIMITE)

HDP-20 Metal-Shell Connectors With .026″ Diameter Right-Angle Posted Contacts 318 Mount (For Pc Board Mounting)



Plug Assemblies (With Ground Indents and Threaded Inserts)

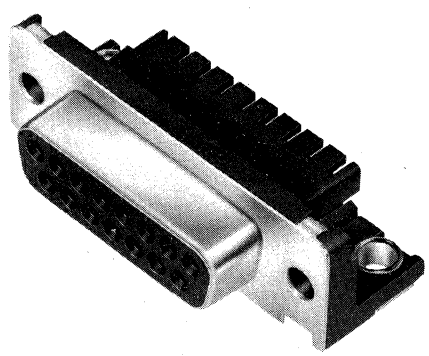
.125″ Post Length
(Recommended for pc board thickness of .093″ maximum)

Material and Finish:
Front Shell — Steel, tin plated
Housing — Thermoplastic, 94V-0 rated, black
Eyelets — Brass, tin plated
Pin Contacts (posted) — Brass, duplex plated as follows:
Duplex[1] — .000030″ gold on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — Gold flash on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Contact Positions (Shell Size)	Part Numbers	
	Duplex[1]	Duplex[2]
9 (1)	747250-4	747250-3
15 (2)	747236-4	747236-3
25 (3)	747238-4	747238-3
37 (4)	747252-4	747252-3

Note: All plug assemblies are preloaded with size 20 DF posted pin contacts.

HDP-20 Metal-Shell Connectors With .026″ Diameter Right-Angle Posted Contacts 318 Mount (For Pc Board Mounting)



Receptacle Assemblies (With Threaded Inserts)

.125″ Post Length
(Recommended for pc board thickness of .093″ maximum)

Material and Finish:
Front Shell — Steel, tin plated
Housing — Thermoplastic, 94V-0 rated, black
Eyelets — Brass, tin plated
Socket Contacts (posted) — Phosphor bronze, duplex plated as follows:
Duplex[1] — .000030″ gold on mating end for length of .100″ minimum .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — Gold flash on mating end for length of .100″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Contact Positions (Shell Size)	Part Numbers	
	Duplex[1]	Duplex[2]
9 (1)	745781-4	745781-3
15 (2)	745782-4	745782-3
25 (3)	745783-4	745783-3
37 (4)	745784-4	745784-3

Note: All receptacle assemblies are preloaded with size 20 DF posted socket contacts.

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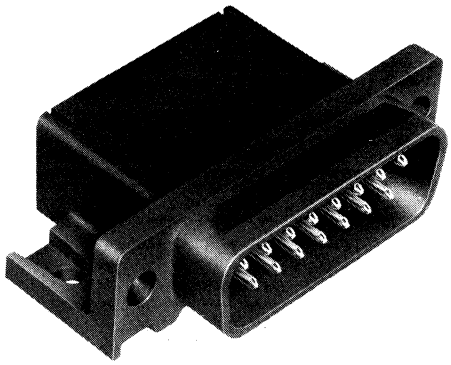
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

HDP-20 All Plastic Connectors With .026″ Diameter Right-Angle Posted Contacts 590 Mount (For Pc Board Mounting)



Plug Assemblies With 4-40 Threaded Inserts

.125″ Post Length
(Recommended for pc board thickness of .093″ maximum)

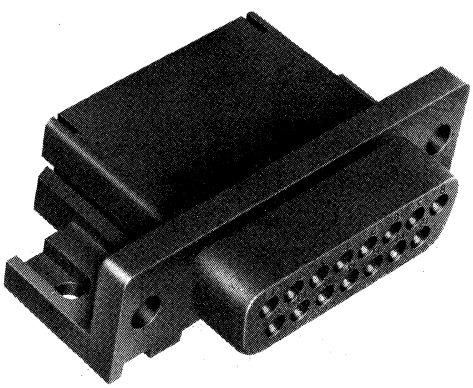
Material and Finish:

Housing — Thermoplastic, 94V-0 rated, black
Threaded Inserts — Brass, unplated
Pin Contacts (posted) — Brass, duplex plated as follows:
Duplex[1] — .000030″ gold on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — Gold flash on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Contact Positions (Shell Size)	Plug Assembly Part Number	
	Duplex[1]	Duplex[2]
9 (1)	747467-4	747467-3
15 (2)	747468-4	747468-3
25 (3)	747469-4	747469-3
37 (4)	747470-4	747470-3

Note: All plug assemblies are preloaded with size 20 DF posted pin contacts.

HDP-20 All-Plastic Connectors With .026″ Diameter Right-Angle Posted Contacts 590 Mount (For Pc Board Mounting)



Receptacle Assemblies With 4-40 Threaded Inserts

.125″ Post Length
(Recommended for pc board thickness of .093″ maximum)

Material and Finish:

Housing — Thermoplastic, 94V-0 rated, black
Threaded Inserts — Brass, unplated
Socket Contact (posted) — Phosphor bronze, duplex plated as follows:
Duplex[1] — .000030″ gold on mating end for length of .100″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel
Duplex[2] — Gold flash on mating end for length of .100″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Number of Contact Positions (Shell Size)	Part Numbers	
	Duplex[1]	Duplex[2]
9 (1)	747459-4	747459-3
15 (2)	747460-4	747460-3
25 (3)	747461-4	747461-3
37 (4)	747462-4	747462-3

Note: All receptacle assemblies are preloaded with size 20 DF posted socket contacts.

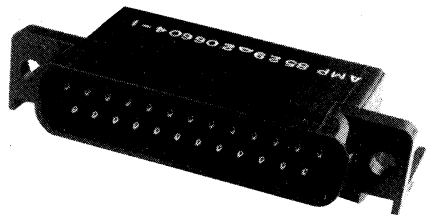
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

Subminiature D Connectors (AMPLIMITE)

HDP-20 All-Plastic Connectors With .025″ Square Right-Angle Posted Contacts 590 Mount (For Pc Board Mounting)



Plug Assemblies

.125″ Post Length
(Recommended for pc board thickness of .093″ maximum)

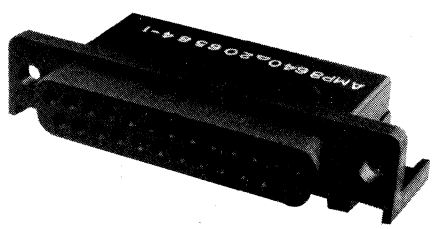
Material and Finish:

Housing — Thermoplastic, 94V-0 rated, black
Plug Contact — Brass, plated as follows:
Gold Flash — over .000030″ nickel on entire contact
Select Gold — .000030″ gold on mating end for a length of .150″ minimum, gold flash on remainder, all over .000050″ nickel on entire contact

Number of Contact Positions (Shell Size)	Part Numbers	
	Gold Flash	Select Gold
9 (1)	207081-1	207081-2
15 (2)	206913-1	206913-2
25 (3)	206604-1	206604-2
37 (4)	206816-1	206816-2
50 (5)	206971-1	206971-2

Note: All plug assemblies are preloaded with size 20 DF posted pin contacts.

HDP-20 All-Plastic Connectors With .025″ Square Right-Angle Posted Contacts 590 Mount (For Pc Board Mounting)



Receptacle Assemblies

.125″ Post Length
(Recommended for pc board thickness of .093″ maximum)

Material and Finish:

Housing — Thermoplastic, 94V-0 rated, black
Receptacle Contact — Phosphor bronze, plated as follows:
Gold Flash — over .000030″ nickel on entire contact
Select Gold — .000030″ gold on mating end for a length of .100″ minimum, gold flash on remainder, all over .000050″ nickel on entire contact

Number of Contact Positions (Shell Size)	Part Numbers	
	Gold Flash	Select Gold
9 (1)	207084-1	207084-2
15 (2)	206914-1	206914-2
25 (3)	206584-1	206584-2
37 (4)	206817-1	206817-2
50 (5)	206973-1	206973-2

Note: All receptacle assemblies are preloaded with size 20 DF posted socket contacts.

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AMP Incorporated, Harrisburg, PA 17105

AMP

HDE-20 Metal-Shell Connectors With Insulation Displacement Contacts

Material and Finish:

Shell — Steel, tin plated

Insert — Thermoplastic, 94V-0 rated, black

Pin Contact — Phosphor bronze, duplex plated as follows:

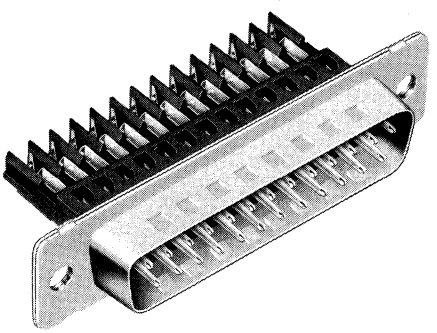
Duplex[1] — .000030″ gold on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

Duplex[2] — Gold flash on mating end for length of .150″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000030″ nickel

Socket Contact — Phosphor bronze, duplex plated as follows:

Duplex[1] — .000030″ gold on mating end for length of .100″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000050″ nickel

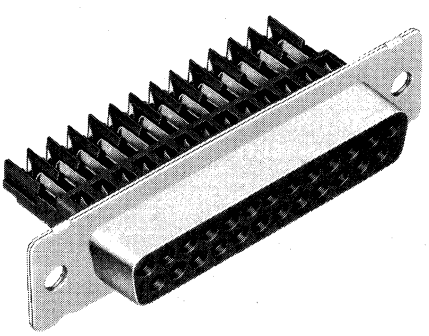
Duplex[2] — Gold flash on mating end for length of .100″ minimum, .000100″-.000200″ bright tin or bright tin-lead on termination end, with entire contact underplated .000030″ nickel



Plug Assemblies

Number of Contact Positions (Shell Size)	Part Numbers	
	Duplex[1]	Duplex[2]
9 (1)	745492-2	745492-5
15 (2)	745494-2	745494-5
25 (3)	745496-2	745496-5
37 (4)	745498-2	745498-5

Notes: 1. All plug assemblies are preloaded with insulation displacement crimp pin contacts. Contacts accept a maximum wire insulation wall thickness of .015″ and a maximum wire insulation diameter of .060″
2. For solid or stranded (7-strand) wire, 26-22 AWG



Receptacle Assemblies

Number of Contact Positions (Shell Size)	Part Numbers	
	Duplex[1]	Duplex[2]
9 (1)	745491-2	745491-5
15 (2)	745493-2	745493-5
25 (3)	745495-2	745495-5
37 (4)	745497-2	745497-5

Notes: 1. All receptacle assemblies are preloaded with insulation displacement crimp socket contacts. Contacts accept a maximum wire insulation wall thickness of .015″ and a maximum wire insulation diameter of .060″
2. For solid or stranded (7-strand) wire, 26-22 AWG

Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

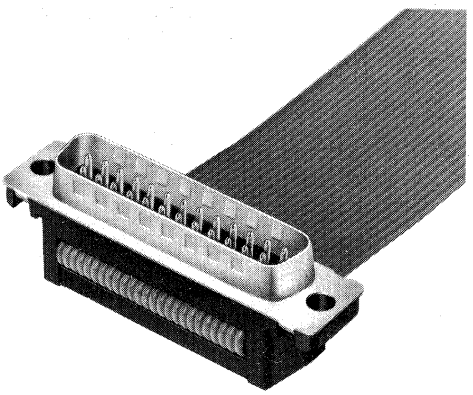
AMP

Subminiature D Connectors (AMPLIMITE)

HDF-20 Low-Profile Metal-Shell Connectors (For Round-Conductor Flat Ribbon Cable)

Material and Finish:

Front Shell — Steel, tin plated
Housing, Cover, & Strain Relief — Thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, duplex plated .000030″ gold on mating end, .000100″-.000200″ bright tin-lead on termination end, with entire contact underplated .000050″ nickel



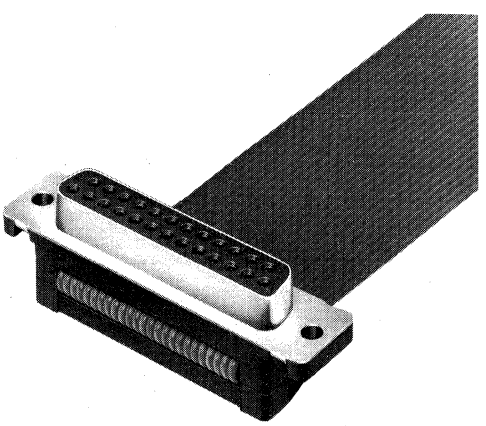
Plug Assemblies

(With Standard Mounting Holes)

Number of Positions (Shell Size)	Strain Relief Part Numbers	Plug Assembly Part Numbers
9 (1)	747275-4	747306-4
15 (2)	747275-3	747306-3
25 (3)	747275-2	747306-2
37 (4)	747275-1	747306-1
50 (5)	746785-1	746790-1*

*With threaded inserts

Note: These plug assemblies are supplied with housing and cover (preassembled). Strain reliefs may be purchased separately.



Receptacle Assemblies

(With Standard Mounting Holes)

Number of Positions (Shell Size)	Strain Relief Part Numbers	Receptacle Assembly Part Numbers
9 (1)	747275-4	747303-4
15 (2)	747275-3	747303-3
25 (3)	747275-2	747303-2
37 (4)	747275-1	747303-1
50 (5)	746785-1	746789-1*

*With threaded inserts

Note: These receptacle assemblies are supplied with housing and cover (preassembled). Strain reliefs may be purchased separately.

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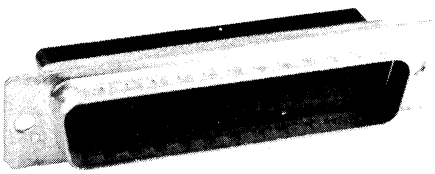
AMP

HDP-22 Metal-Shell Connectors For Snap-In Contacts

Material and Finish:

Shell — Steel, tin plated
Insert — Glass-filled nylon, 94V-0 rated, black



Plugs

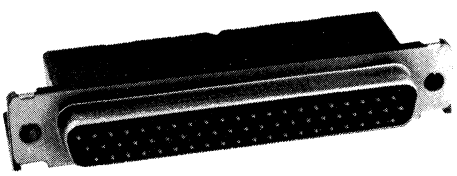
Number of Contact Positions (Shell Size)	Part Numbers
15 (1)	748364-1
62 (4)	748367-1
78 (5)	748368-1

Note: All plugs accept size 22 precision formed pin contacts (see below).

HDP-22 Metal-Shell Connectors With Right-Angle Posted Contacts (For Pc Board Mounting)

Material and Finish:

Shell — Steel, tin plating over copper plating
Solderable Eyelet — Brass, tin-lead plated
Pin Contact — Phosphor bronze, duplex plated .000030″ thick on mating end, .000100″-.000200″ tin-lead on termination end, with entire contact underplated .000050″ nickel



Receptacle Assemblies With Threaded Inserts and Solderable Eyelet

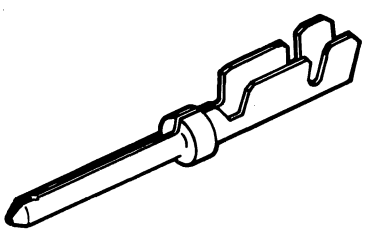
Number of Contact Positions (Shell Size)	Part Numbers
15 (1)	1-748390-4
62 (4)	1-748394-4
78 (5)	1-748483-4

Note: All receptacle assemblies are preloaded with size 22 DF posted socket contacts.

HDP-22 Connector Pin Contacts, Precision Formed

Material and Finish:

Pin — Brass, duplex plated .000030″ gold on mating end for length of .150″, tin-plated wire barrels over .000050″ nickel



Wire Size Range (AWG)	Insulation Diameter (Maximum)	Part Number	
		Strip Form	Loose Piece
28-22	.040	748333-2	748333-4

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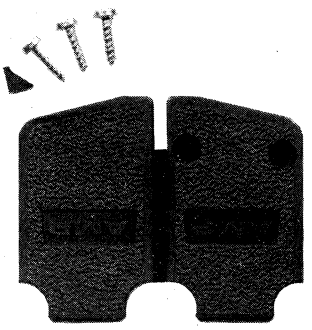
AMP Incorporated, Harrisburg, PA 17105

AMP

Subminiature D Connectors (AMPLIMITE)

Accessories

Straight/45° Exit Cable Clamp Assemblies (One Piece)



For use with HDP-20 metal-shell solder cup and snap-in contact connectors

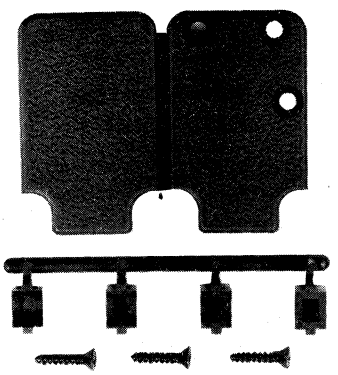
They can be used on either a plug or receptacle and will not interfere with commonly used hardware, such as male screw retainers or female screw locks.

Material and Finish:
Cable Clamp Housing — Thermoplastic, textured finish, black
Gates — Thermoplastic, black
Screws — Steel, zinc plated

Shell Size (Number of Contact Positions)	Cable Diameter (Maximum)	Part Numbers
1 (9)	.256	205729-1
2 (15)	.320	205730-1
3 (25)	.420	205718-1
4 (37)	.490	205731-1
5 (50)	.600	205732-1

Note: All parts packaged unassembled in individual kits.

Straight/90° Exit Cable Clamp Assemblies (One Piece)



For use with HDP-20 metal-shell solder cup and snap-in contact connectors

They can be used on either a plug or receptacle and will not interfere with commonly used hardware, such as male screw retainers or female screw locks.

Material and Finish:
Cable Clamp Housing — Thermoplastic, textured finish, black
Gates — Thermoplastic, black
Screws — Steel, zinc plated, black

Shell Size (Number of Contact Positions)	Cable Diameter (Maximum)		Part Numbers
	Straight Exit	90° Exit	
1 (9)	.250	.250	207467-1
2 (15)	.325	.325	207470-1
3 (25)	.500	.500	207345-1
4 (37)	.675	.500	207473-1
5 (50)	.500	.500	207476-1

Note: All parts packaged unassembled in individual kits.

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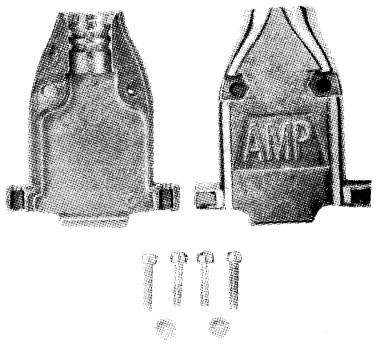
AMP

Straight/Exit RFI/EMI Shields For Jacketed Cable (Two Piece)

This RFI/EMI shield allows cable to be fully prepared and terminated to the connector before the shield is installed. During installation, the shield is folded back and compressed into the cable opening of the shield. For greater cable support and shielding effectiveness, use split-ring or crimp ferrules.



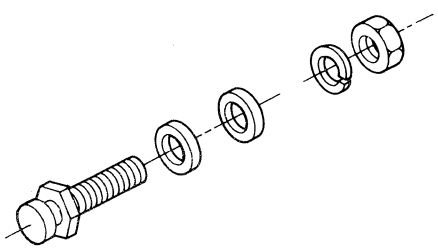
Material and Finish:

Shield — Zinc alloy, plated bright nickel over bright copper
Fillister Head Screws — Steel, zinc plated
Mounting Screws & Hex Nuts — Steel, zinc plated

Shell Size (Number of Contact Positions)	Cable Diameter (Maximum)	Part Numbers
1 (9)	.250	745171-1
	.370	745171-5
2 (15)	.300	745172-2
	.375	745172-1
	.430	1-745172-3
3 (25)	.280	745173-5
	.350	745173-4
	.430	745173-3
4 (37)	.425	745174-4
	.500	745174-3
5 (50)	.450	745175-5
	.525	745175-4

Note: All parts are packaged unassembled in individual kits.

4-40 Locking Post Assemblies



Material and Finish:

All Parts — Cold-rolled steel, zinc plated (yellow chromate)

Part Number 206514-1 (Locking Post Assembly 4-40 Thread)

Notes: 1. All parts are packaged unassembled.
2. Each kit is comprised of two complete assemblies.
3. Locking post assemblies must be used with slide latch assembly.

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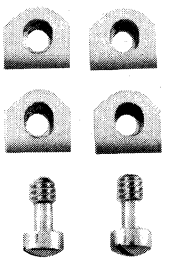
AMP

Subminiature D Connectors (AMPLIMITE)

Accessories



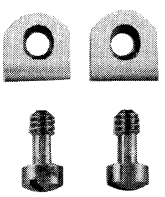
4-40 Male Screw Retainers

For metal-shell connectors (HDP-20, HDE-20)

Material and Finish:
Male Screw — Steel, zinc plated (clear or yellow chromate)
Retaining Clip — Steel, .012″ thick, zinc plated (yellow chromate)

Kit Number 205980-1 (yellow chromate screw)
205980-4 (clear chromate screw)

Notes: 1. All parts are packaged unassembled.
2. Each kit contains two male screws and two retaining clips.
3. Male screws mate with female screwlocks.



4-40 Male Screw Retainers

For metal-shell connectors (HDF-20)

Material and Finish:
Male Screw — Steel, zinc plated (clear chromate)
Retaining Clip — Steel, .012″ thick, zinc plated (yellow chromate)

Kit Number 746881-1
(Two assemblies per kit)

Notes: 1. All parts are packaged unassembled.
2. Each kit includes two male 4-40 screws and two retaining clips.
3. Retaining clips must be assembled onto connector flanges with threaded holes toward ribbon cable side of connector.
4. Male screws mate with female screwlocks.

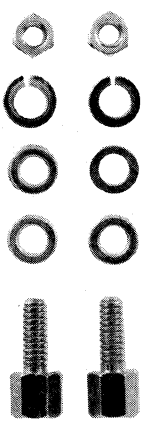
4-40 Female Screwlocks

For metal-shell and all-plastic connectors (HDP-20), metal-shell connectors (HDF-20)

Male Thread Lengths:
Short, .250″
Standard, .312″
Long, .560″

Material and Finish:
All Parts — Cold-rolled steel, zinc plated (clear or yellow chromate)

Finish	Kit Number				
	Short Female Screwlock	Standard Female Screwlock		Individual Long Female Screwlock	Standard Screwlock Only
		Individual	Bulk Packed*		
Yellow Chromate	207952-1	205817-1	205817-2	207719-1	205818-2
Clear Chromate	207952-3	—	—	207719-3	205818-3



Notes: 1. All parts are packaged unassembled.
2. Short female screwlock kits contain two square nuts, two female screwlocks and four flat washers. Other kits contain two hex nuts, two female screwlocks, two lock washers and four flat washers.
3. One or two flat washers may be required for panel thickness less than .060″. Female screwlocks are not recommended for panel thicknesses greater than .060″
4. Standard female screwlocks can be used on any HDP-20 or HDF-20 metal-shell or all-plastic plug or receptacles.
5. Female screwlocks mate with male screw retainers.
6. Short female screwlocks not for use with HDF-20 connectors.

*Each part is individually bulk packed for multiple kit orders.

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AMP Incorporated, Harrisburg, PA 17105

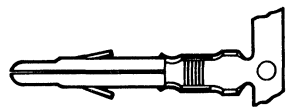
AMP

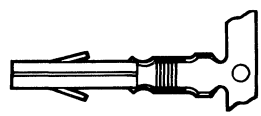
Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

- Recognized under the Component Program of Underwriters Laboratories, Inc., File No. E28476
- CSA Certified, File No. LR 16455

Pin and Socket Contacts (Universal MATE-N-LOK Connectors)

.084″ diameter pin
.012″ stock thickness
Can be used in either plug or cap housings



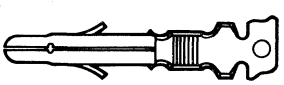


Wire Size Range (AWG)	Insulation Diameter Range	Material and Finish	Part Numbers			
			Strip Form		Loose Piece	
			Pin	Socket	Pin	Socket
30-26	.032–.057	Brass, Pre-tin	350924-1	350925-1	—	—
24-18	.040–.100	Brass, Pre-tin	350561-1	350570-1* 350851-1	350690-1	350689-1*
		Brass, Gold	350561-2	350570-2* 350851-2	350690-2	350689-2*
		Brass, Select Gold	350561-7	350570-7* 350851-7	350690-7	350689-7*
		Phosphor Bronze, Pre-tin	350561-3	350570-3*	350690-3	350689-3*
		Phosphor Bronze, Select Gold	—	350570-6*	—	—
20-14	.060–.130	Brass, Pre-tin	350218-1	350536-1	350547-1	350550-1
		Brass, Gold	350218-2	350536-2	350547-2	350550-2
		Brass, Select Gold	350218-7	350536-7	350547-7	350550-7
		Phosphor Bronze, Pre-tin	350218-3	350536-3	350547-3	350550-3
		Phosphor Bronze, Select Gold	350218-6	350536-6	350547-6	350550-6
20-14	.130–.200	Brass, Pre-tin	350538-1	350537-1	350552-1	350551-1
		Brass, Gold	350538-2	350537-2	350552-2	350551-2
		Brass, Select Gold	—	350537-7	350552-7	350551-7
		Phosphor Bronze, Pre-tin	350538-3	350537-3	350552-3	350551-3
		Phosphor Bronze, Select Gold	350538-6	350537-6	350552-6	350551-6
18-14**	.130–.200	Brass, Pre-tin	350873-1	350874-1	—	—
		Phosphor Bronze, Pre-tin	350873-3	350874-3	350918-3	350919-3
12-10	.200 Maximum[1]	Phosphor Bronze, Pre-tin	350922-3	350923-3	640309-3	640310-3
		Phosphor Bronze, Select Gold	350922-6	350923-6	—	640310-6
		Phosphor Bronze, Gold	350922-4	350923-4	—	—

*Socket contact — .010″ stock thickness.
**Contacts have larger wire barrel and are recommended for predominant use of 14 AWG.
[1]No insulation barrel these contacts; insulation maximum diameter limited by housing.

Universal Split Pin Contacts

.084″ pin diameter
.012″ stock thickness
Can be used in either plug or cap housings



Wire Size Range (AWG)	Insulation Diameter Range	Part Numbers					
		Strip Form			Loose Piece		
		Brass Pre-Tin	Brass Gold Plated	Brass Select Gold	Brass Pre-Tin	Brass Gold Plated	Brass Select Gold
24-18	.040–.100	350699-1	350699-2	350699-7	350706-1	350706-2	350706-7
20-14	.060–.130	350687-1	350687-2	350687-7	350705-1	350705-2	350705-7
20-14	.130–.200	350700-1	350700-2	350700-7	350707-1	—	350707-7

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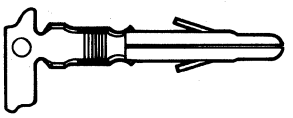
AMP Incorporated, Harrisburg, PA 17105

AMP

Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

Universal Grounding Pin

.100″ longer than standard pin contacts
.012″ stock thickness
Can be used in either plug or cap housings

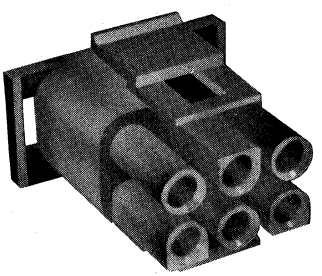


Wire Size Range (AWG)	Insulation Diameter Range	Part Numbers	
		Strip Form	Loose Piece
20-14	.060-.130	350654-1	350669-1

Note: Pre-tin brass

Connector Housings (Universal MATE-N-LOK Connectors)

Material:
Nylon, 94V-2 rated, natural, or 94V-0 rated, brick red

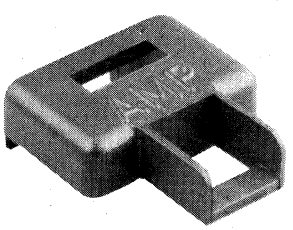


Number of Circuits	Part Numbers			
	Plug		Cap	
	94V-2	94V-0	94V-2	94V-0
1	1-350867-0	350865-1	1-350868-0	350866-1
	1-641084-0[1]	—	1-641083-0[1]	—
2	1-480698-0*	350777-1*	1-480699-0*	350778-1*
3	1-480700-0*	350766-1*	1-480701-0*	350767-1*
4	1-480702-0*	350779-1*	1-480703-0*	350780-1*
5	1-480763-0*	350809-1*	1-480764-0*	350810-1*
6	640585-1*	640581-1*	—	—
	1-480704-0	350715-1	1-480705-0	350781-1
8	640586-1*	640582-1*	—	—
9	1-480706-0	350720-1	1-480707-0	350782-1
	1-641769-0[1]	—	—	—
12	1-480708-0	350735-1	1-480709-0	350783-1
	1-641768-0[1]	—	—	—
15	1-480710-0	350736-1	1-480711-0	350784-1

*In-line version.
[1]Material has 125°C temperature rating.

Adapters for Cap Housings (Universal MATE-N-LOK Connectors)

Designed to anchor the strain reliefs and assembly modules to the cap housings



Material:
Nylon, 94V-2 or 94V-0 rated

Used With	Part Numbers			
	With Nibs		Without Nibs	
	94V-2	94V-0	94V-2	94V-0
2 & 6 Circuit Cap Housings	643182-1	643182-2	643131-1	643131-2
All Other Cap Housings	641777-1	641778-1	641777-2	641778-2

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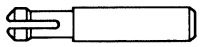
AMP Incorporated, Harrisburg, PA 17105

AMP

Keying Plug

Snaps into either plug or cap housing

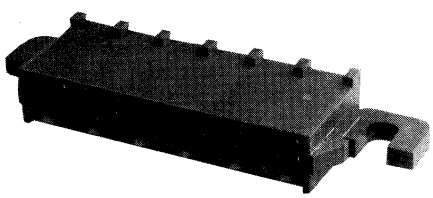


Material	Part Numbers
94V-2	1-640415-1
94V-0	1-640415-0

Right-Angle Pc Board Headers (Universal MATE-N-LOK Connectors)

Material and Finish:

Housing — Nylon, 94V-2 rated, natural, or 94V-0 rated, brick red
Contact — Phosphor bronze, pre-tin plated or .000030″ minimum gold over .000050″ minimum nickel



Number of Circuits	Contact Finish	Part Numbers	
		Pin	Socket
		94V-0	94V-0
2	Pre-tin	1-350942-0	643226-1
	Gold	2-350942-0	—
3	Pre-tin	1-350943-0	643228-1
	Gold	2-350943-0	—
4	Pre-tin	1-350944-0	643230-1
	Gold	2-350944-0	—
5	Pre-tin	1-350945-0	—
	Gold	2-350945-0	—
6	Pre-tin	640583-1	643234-1
	Gold	640583-2	—
8	Pre-tin	640584-1	643236-1
	Gold	640584-2	—

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AMP Incorporated, Harrisburg, PA 17105

AMP

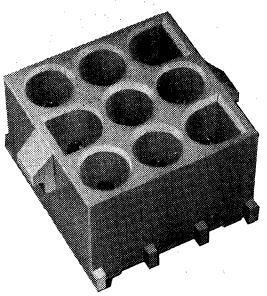
Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

Pc Board Pin Headers
(Universal MATE-N-LOK Connectors)

Material and Finish:
Housing — Nylon, 94V-2 rated, natural, or 94V-0 rated, brick red
Contact — Phosphor bronze, pre-tin plated or .000030″ minimum gold over .000050″ minimum nickel.

In-Line Circuits

Number of Circuits	Housing Material	Pin Finish	Pin Header Part Numbers		
			Standard Tail*	Standard Tail* Polarized	Long Tail**
2	94V-2	Pre-tin	350428-1	641963-1	350582-1
		Gold	350428-2	—	350582-2
	94V-0	Pre-tin	350786-1	641964-1	350787-1
		Gold	350786-2	—	350787-2
3	94V-2	Pre-tin	350429-1	641965-1	350583-1
		Gold	350429-2	—	350583-2
	94V-0	Pre-tin	350789-1	641966-1	350790-1
		Gold	350789-2	—	350790-2
4	94V-2	Pre-tin	350430-1	641967-1	350584-1
		Gold	350430-2	—	350584-2
	94V-0	Pre-tin	350792-1	641968-1	350793-1
		Gold	350792-2	—	350793-2
5	94V-2	Pre-tin	640466-1	—	—
	94V-0	Pre-tin	640900-1	643406-1	—
6	94V-2	Pre-tin	641832-1	—	—
	94V-0	Pre-tin	641831-1	643408-1	—
8	94V-2	Pre-tin	641825-1	—	—
	94V-0	Pre-tin	641828-1	643410-1	—



Multiple-Row Circuits Shown

Multiple-Row Circuits

Number of Circuits	Housing Material	Pin Finish	Pin Header Part Numbers		
			Standard Tail*	Standard Tail* Polarized	Long Tail**
6	94V-2	Pre-tin	350431-1	—	350585-1
		Gold	350431-2	—	350585-2
	94V-0	Pre-tin	350711-1	641970-1	350732-1
		Gold	350711-2	—	350732-2
9	94V-2	Pre-tin	350432-1	641971-1	350586-1
		Gold	350432-2	—	350586-2
	94V-0	Pre-tin	350712-1	641972-1	350742-1
		Gold	350712-2	—	350742-2
12	94V-2	Pre-tin	350433-1	—	350587-1
		Gold	350433-2	—	350587-2
	94V-0	Pre-tin	350713-1	641974-1	350737-1
		Gold	350713-2	—	350737-2
15	94V-2	Pre-tin	350434-1	641975-1	350588-1
		Gold	350434-2	—	—
	94V-0	Pre-tin	350714-1	641976-1	350738-1
		Gold	350714-2	—	350738-2

*Use standard tail for .062″ thick printed circuit board.

**Use long tail for .125″ thick printed circuit board.

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AMP Incorporated, Harrisburg, PA 17105

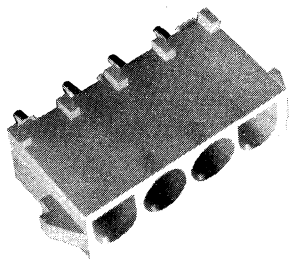
AMP

Pc Board Socket Headers (Universal MATE-N-LOK Connectors)

Material and Finish:

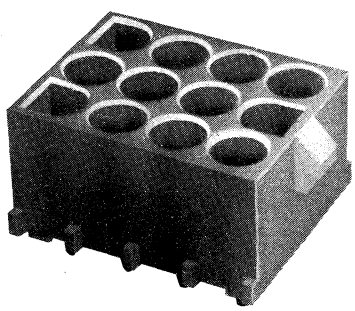
Housing — Nylon, 94V-2 rated, natural, or 94V-0 rated, brick red
Contact — Phosphor bronze, pre-tin plated or .000030″ minimum gold over .000050″ minimum nickel

In-Line Circuits



Number of Circuits	Housing Material	Socket Finish	Socket Header Part Numbers		
			Standard Tail*	Standard Tail* Polarized	Long Tail**
2	94V-2	Pre-tin	350759-4	—	350986-4
		Gold	350759-3	—	—
	94V-0	Pre-tin	350824-1	—	350831-1
		Gold	350824-2	—	—
3	94V-2	Pre-tin	350760-4	—	350987-4
		Gold	350760-3	—	—
	94V-0	Pre-tin	350825-1	643414-1	350832-1
		Gold	350825-2	—	—
4	94V-2	Pre-tin	350761-4	—	350988-4
	94V-0	Pre-tin	350826-1	643416-1	350833-1
		Gold	350826-2	—	350833-2
5	94V-2	Pre-tin	640467-1	—	—
	94V-0	Pre-tin	640901-1	—	—
		Gold	640901-2	—	—

Multiple-Row Circuits



Number of Circuits	Housing Material	Socket Finish	Socket Header Part Numbers		
			Standard Tail*	Standard Tail* Polarized	Long Tail**
6	94V-2	Pre-tin	350762-4	643423-1	350989-4
		Gold	350762-3	—	—
	94V-0	Pre-tin	350827-1	643424-1	350834-1
		Gold	350827-2	—	—
9	94V-2	Pre-tin	—	—	350990-4
	94V-0	Pre-tin	350828-1	643426-1	350835-1
		Gold	350828-2	—	350835-2
12	94V-2	Pre-tin	350764-4	—	350991-4
	94V-0	Pre-tin	350829-1	643428-1	350836-1
		Gold	350829-2	—	—
15	94V-2	Pre-tin	350765-4	643429-1	350992-4
	94V-0	Pre-tin	350830-1	—	350837-1
		Gold	—	—	350837-2

*Use standard tail for .062″ thick printed circuit board.
**Use long tail for .125″ thick printed circuit board.

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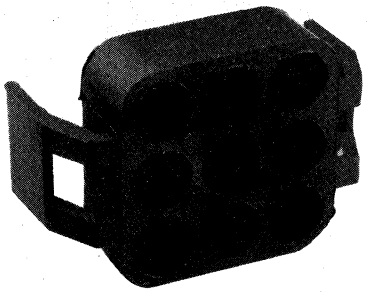
AMP Incorporated, Harrisburg, PA 17105

AMP

Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

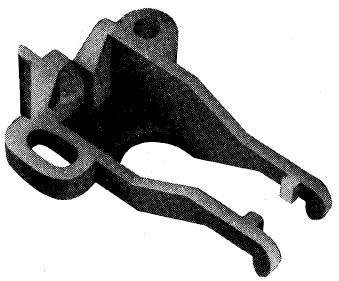
Assembly Modules (Universal MATE-N-LOK Connectors)



Material:
94V-0 rated, brick red
.160″ maximum wire outside diameter

Description	Number of Circuits	Part Numbers
In-Line Circuits	2	643250-1
	3	643251-1
	4	643252-1
Multiple Row Circuits	6	643253-1
	9	643254-1
	12	643255-1
	15	643256-1

Strain Reliefs (Universal MATE-N-LOK CONNECTORS)



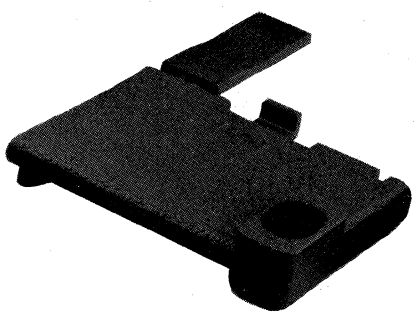
Material:
94V-2 or 94V-0 rated

Standard Version

Number of Circuits	Part Numbers	
	94V-2	94V-0
2, 3, 4, 5	1-350589-0	350811-1
6, 9, 12, 15	1-350590-0	350812-1

Notes: 1. Requires two No. 6 x ⅜″ long Type B pan head sheet metal screws (not supplied).
2. Strain relief part numbers represent one half of an assembly. Order two of a part number per connector.

Enclosed Version



Type	Number of Circuits	Single Wire Diameter Range	Wire Bundle Diameter Range	Part Numbers	
				94V-2	94V-0
In-Line Circuits	2	.040–.190	—	1-640719-0	640713-1
		—	.200–.350	1-640719-1	640713-2
	3	.040–.190	—	1-640720-0	640714-1
		—	.200–.350	641763-1	641945-1
	4	.040–.190	—	641775-1	641776-1
		—	.200–.350	641775-2	641776-2
	5	.040–.190	—	643030-3	643030-1
		—	.200–.350	643030-2	643030-4
	6	.040–.190	—	—	643313-1
		—	.200–.350	—	643313-2
	8	.040–.190	—	—	643314-1
Multiple Row Circuits	6	—	.120–.650	1-640721-0	640715-1
	9	—	.120–.650	1-640722-0	640716-1
	12	—	.150–.750	1-640723-0	640717-1
	15	—	.200–.850	1-640724-0	640718-1

Notes: 1. Requires two No. 6 x ⅜″ long Type B pan head sheet metal screws (not supplied).
2. Strain relief part numbers represent one half of an assembly. Order two of a part number per connector.

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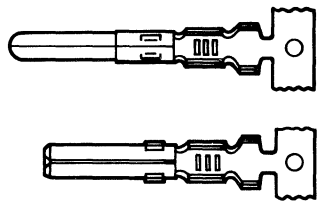
AMP

Pin and Socket Contacts (Commercial MATE-N-LOK Connectors)

.084″ pin diameter
.012″ stock thickness

Material and Finish:
See chart



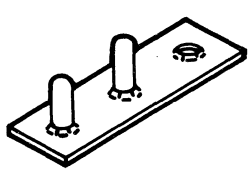
Wire Size Range (AWG)	Insulation Diameter (Maximum)	Material and Finish	Part Numbers			
			Pin		Socket	
			Strip	Loose Piece	Strip	Loose Piece
30–22	.075	Brass, Tin Plated	350079-1	61174-1	350078-1	61173-1
		Phosphor Bronze, Tin Plated	350079-4	—	350078-4	61173-4
		Brass*	350079-5	—	350078-5	61173-5
24–18	.100	Brass, Tin Plated	61116-1	60618-1	61314-1	60617-1
		Brass	—	—	—	60617-2
		Phosphor Bronze, Tin Plated	61116-4	60618-4	61314-4	60617-4
		Brass*	61116-5	60618-5	61314-5	60617-5
		Phosphor Bronze**	61116-6	60618-6	61314-6	60617-6
20–14	.130	Brass, Tin Plated	61118-1	60620-1	61117-1	60619-1
		Brass	61118-2	—	—	—
		Phosphor Bronze, Tin Plated	61118-4	60620-4	61117-4	60619-4
		Brass*	61118-5	60620-5	61117-5	60619-5
		Phosphor Bronze*	—	—	61117-6	—
(2) 18 or (1) 18 & (1) 16 Stocked	(2) .115	Brass, Tin Plated	—	—	350557-1	60615-1
		Phosphor Bronze, Tin Plated	—	—	350557-4	—
PCB Contacts	—	Phosphor Bronze, Tin Plated	—	—	—	61320-1[1]
	—	Phosphor Bronze, Bright Tin Plated	—	—	—	61320-4[1]
		Phosphor Bronze, Tin Plated	—	350074-1[2]	—	350073-1[2]
Side Feed Ground Pin	—	Brass, Tin Plated	61527-2	—	—	—

*.000030″ gold in mating area and inside wire barrel; remainder of contact is nickel plated.
**.000030″ gold in mating area ONLY; remainder of contact is nickel plated.
[1]For .062″ maximum board thickness.
[2]For .125″ maximum board thickness.

Commoning Tabs, Free Hanging (Commercial MATE-N-LOK Connectors)

.008″ stock thickness

Material and Finish:
Brass, tin plated



Number of Circuits	Part Numbers
2*	60843-1
3**	60842-1

*Used to common any two adjacent terminals in free-hanging or motor-mount housings.
**Used to common any three adjacent terminals in free-hanging or motor-mount housings.

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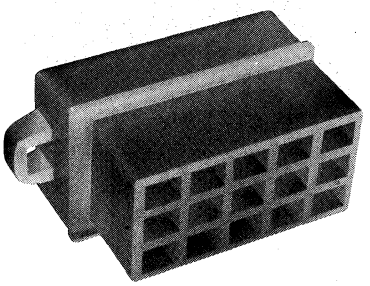
AMP

Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

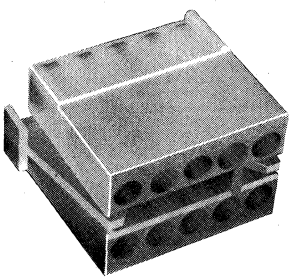
Panel-Mount Connector Housings (Commercial MATE-N-LOK Connectors)



Material:
Nylon, natural

Number of Circuits	Part Numbers	
	Pin Housing	Socket Housing
3	1-480305-0	1-480304-0
4	1-480426-0	1-480425-0
6	1-480276-0	1-480273-0
9	1-480277-0	1-480274-0
12	1-480278-0	1-480275-0
15	1-480324-0	1-480323-0

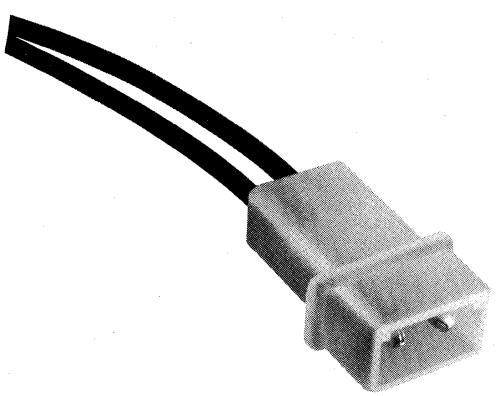
Motor-Mount Connector Housings (Commercial MATE-N-LOK Connectors)



Material:
Nylon, natural

Number of Circuits	Part Numbers	
	Pin Housing	Socket Housing
6	1-480271-0	1-480270-0
8	1-480284-0	1-480283-0
10	1-480286-0	1-480285-0
12	1-480288-0	1-480287-0
16	1-480439-0	1-480438-0

Free-Hanging Connector Housings (Commercial MATE-N-LOK Connectors)



Material:
Nylon, natural

Number of Circuits	Part Numbers	
	Pin Housing	Socket Housing
1	1-480350-0*	1-480349-0
	1-480351-0**	1-480349-0
2	1-480319-0[1]	1-480318-0[1]
	1-480319-9[1,2]	1-480318-9[1,2]
3	1-480305-0[1]	1-480303-0[1]
	1-480305-9[1,2]	1-480303-9[1,2]
4	1-480426-0[1]	1-480424-0[1]
6	1-480340-0	1-480270-0[1]
8	1-480345-0	1-480283-0[1]
10	1-480339-0	1-480285-0[1]

*Detent lock
**Positive lock
[1]Housing accepts double wire applications where individual insulation diameters do not exceed .115".
[2]Black housing color

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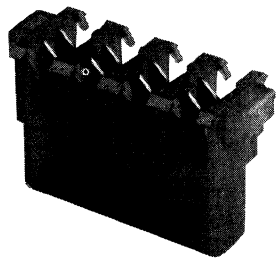
AMP

Insulation Displacement Plug Assemblies (Commercial MATE-N-LOK Connectors)

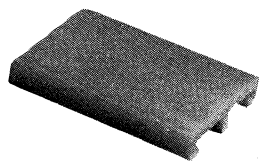


4 circuit

Material and Finish:
Housing — Nylon, 94V-2 rated
Contact — Phosphor bronze, tin plated

Wire Size (AWG)	Housing Color	Part Numbers
22	Red	770156-2
18	Orange	770156-3

Dust Covers
Insulation Displacement Plug Assemblies (Commercial MATE-N-LOK Connectors)

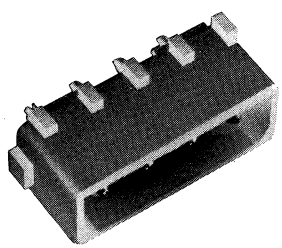


Material:
PVC, 94V-0 rated, cream

Type	Part Numbers
Standard	770232-1
Feed Through	770233-1

Pc Board Pin Headers (Commercial MATE-N-LOK Connectors)

Mate with commercial, motor-mount, and free-hanging socket connectors



Material:
Housing — Nylon, natural
Pin — Copper alloy

Number of Circuits	Part Numbers		
	Standard Pin*		Long Pin**
	Tin Plated	Gold Plated	Tin Plated
2	350539-1	—	350540-1
	350209-1[1]	350209-2[1]	350422-1[1]
3	350541-1	—	—
	350210-1[1]	—	350423-1[1]
4	350543-1	—	350544-1
	350211-1[1]	350211-2[1]	350424-1[1]
6	1-380999-0	2-380999-0	350425-1
8	350212-1	350212-2	350426-1
10	1-380991-0	2-380991-0	350219-1
12	350213-1	—	350220-1
16	350214-1	—	350427-1

*Use standard pin for .062″ thick printed circuit boards.
**Use long pin for .125″ thick printed circuit boards.
[1]Detent lock; all others positive lock.

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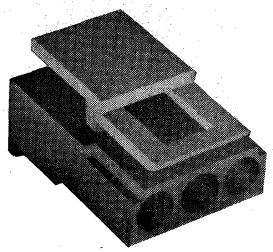
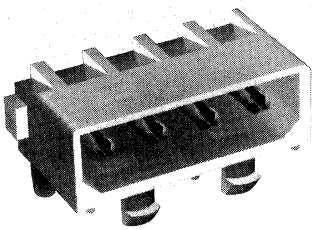
Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)



Positive Lock Socket Housing (Commercial MATE-N-LOK Connectors)

Material:
Nylon, natural

Number of Circuits	Part Numbers
2	1-480720-0
3	1-480721-0
4	1-480722-0

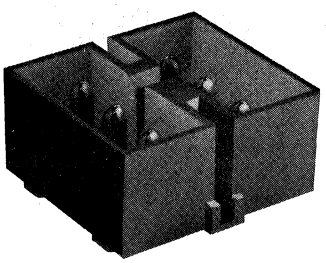


Right-Angle Pc Board Pin Headers (Commercial MATE-N-LOK Connectors)

Material:
Housing — Nylon, 94V-0 rated, natural
Contacts — Phosphor bronze, pre-tin

Number of Circuits	Part Numbers
3	643488-1
4	641737-1

Note: Use with .062″ thick printed circuit board.



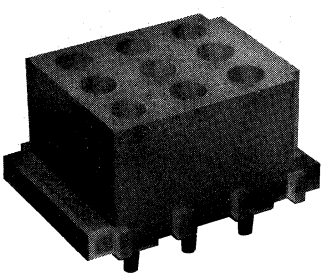
Pc Board Pin Headers with Anti-Solder Wicking Feature (Commercial MATE-N-LOK Connectors)

.010″ stock thickness

Material and Finish:
Housing — Nylon, 94V-2 rated, natural
Contacts — Copper alloy, pre-tin

Number of Circuits	Part Numbers
2	641983-1
4	641985-1
6	641986-1
16	641990-1

Note: Use with .062″ thick printed circuit board.



Pc Board Socket Headers (Commercial MATE-N-LOK Connectors)

Materials:
Housing — Nylon, natural
Contact — Copper alloy, tin plated

Number of Circuits	Part Numbers
9	350642-1
15	350644-1

Note: Use with .062″ thick printed circuit board.

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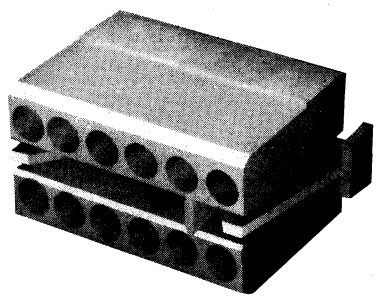
AMP

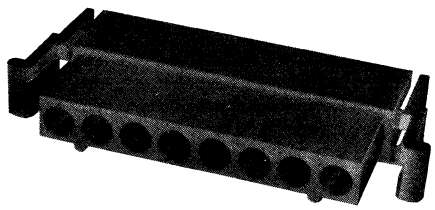
Cap Mount Connector (Commercial MATE-N-LOK Connectors)



Material:
Nylon

12-Circuit Socket Housing **Part Number 1-480433-0**
(.020″–.060″ recommended panel thickness)

8-Circuit Panel-Mount Connector Housings (Commercial MATE-N-LOK Connectors)

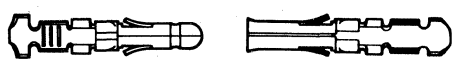


Material:
Nylon

Housing	Part Numbers
Pin (Cap)	1-480460-0
Socket (Plug)	1-480459-0

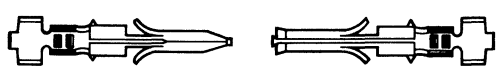
.093″ and .062″ Diameter Pin and Socket Contacts (Commerical Pin and Socket Connectors)

Material and Finish:
Brass, pre-tin plated



.093″ Pin Diameter; .010″ Stock Thickness

Wire Size Range (AWG)	Insulation Diameter (Maximum)	Strip Form Part Numbers	
		Pin	Socket
24–18	.110	350418-1	350417-1
20–14	.140	350416-1	350415-1



.062″ Pin Diameter; .008″ Stock Thickness

Wire Size Range (AWG)	Insulation Diameter (Maximum)	Strip Form Part Numbers	
		Pin	Socket
30–24	.060	640391-1	640392-1
24–18	.110	350629-1	350628-1

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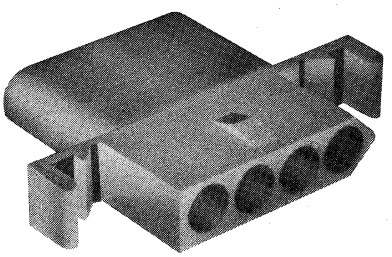
AMP Incorporated, Harrisburg, PA 17105

AMP

Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

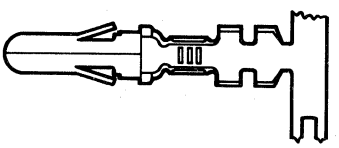
.093″ Diameter Connector Housings (Commerical Pin and Socket Connectors)

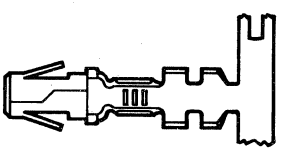


Material:
Nylon, 94V-2 rated, natural

Number of Circuits	Part Numbers			
	Plug		Receptacle	
	With Mounting Ears	Without Mounting Ears	With Mounting Ears	Without Mounting Ears
1	—	770064-1	—	770063-1
2	770068-1	770069-1	770066-1	770065-1
3	770073-1	—	—	770072-1
4	770077-1	—	770076-1	770075-1
9	—	770096-1	770093-1	—

.140″ Diameter Pin and Socket Contacts (.140″ MATE-N-LOK Connectors)



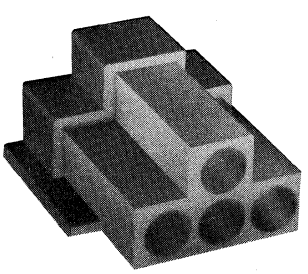


Material and Finish:
Brass, pre-tin
.014″ stock thickness

Wire Size Range* (AWG)	Part Numbers			
	Pin		Socket	
	Strip	Loose Piece	Strip	Loose Piece
20-14	61627-1	350389-1	61626-1	350388-1
14-10	350201-1	350391-1	350200-1	350390-1

*.100″–.180″ insulation diameter range

.140″ Diameter Connector Housings (.140″ MATE-N-LOK Connectors)



Material:
Nylon, natural

Number of Circuits	Application	Part Numbers	
		Pin (Cap)	Socket (Plug)
2	Panel Mount	1-350345-0	1-350344-0
3	Panel Mount	1-350347-0	1-350346-0
4	Free Hanging	1-480512-0	1-480510-0
9	Panel Mount	1-480673-0	1-480672-0
	Free Hanging	1-480586-0	1-480585-0

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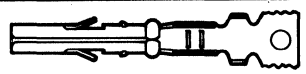
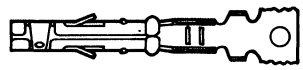
AMP

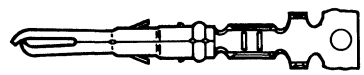
Pin and Socket Contacts (MR Connectors)



Standard Socket



Cantilever Socket



Live Split Pin

Material and Finish:

Phosphor bronze, pre-tin plated or .000050″ nickel over entire contact and .000030″ gold in contact area
.008″ stock thickness

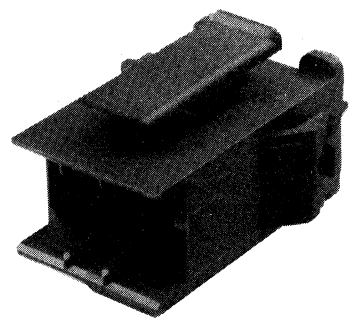
Wire Size Range (AWG)	Insulation Range	Contact Finish	Part Numbers				
			Live Split Pin		Standard Socket*	Cantilever Socket	
			Strip	Loose Piece	Strip	Strip	Loose Piece
26–18	.050–.115	Pre-tin	—	640545-1	641294-1	350665-1	350666-1
		Gold	350967-2	640545-2	641294-2	350665-2	350666-2
26–24	.025–.050	Pre-tin	350968-1	640579-1	—	350696-1	350697-1
		Gold	—	640579-2	—	—	350697-2

*Preferred combination is live split pin and standard socket.

Housings (MR Connectors)

Material:

Nylon, 94V-0 rated, brick red



Number of Circuits	Part Numbers	
	Pin Housing	Socket Housing
2	1-640507-0	1-640517-0
3	1-640508-0	1-640518-0
4	1-640509-0	1-640519-0
6	1-640510-0	1-640520-0
9	1-640511-0	1-640521-0
12	1-640512-0	1-640522-0
15	1-640513-0	1-640523-0
20	1-640514-0	1-640524-0
24	—	1-640525-0
36	—	1-640526-0

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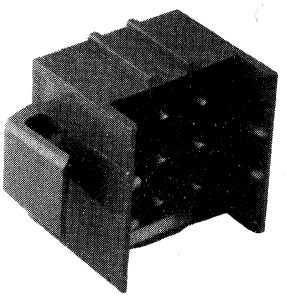
AMP Incorporated, Harrisburg, PA 17105

AMP

Soft-Shell Pin and Socket Connectors (MATE-N-LOK, MR)

Pc Board Pin Headers (MR Connectors)

Material:
Housings — Nylon, 94V-0 rated, brick red
Contacts — Plated tin or .000030″ gold over .000050″ nickel over contact length and matte tin on solder tail end



Number of Circuits	Board Thickness	Part Numbers	
		Tin	Gold
2	.063	640497-1	640497-2
	.130	—	640497-4
3	.063	640498-1	640498-2
	.130	—	640498-4
4	.063	640499-1	640499-2
5	.063	640500-1	640500-2
	.130	640500-3	640500-4
9	.063	640501-1	640501-2
	.130	—	640501-4
12	.063	640502-1	640502-2
	.130	640502-3	640502-4
15	.063	640503-1	640503-2
	.130	640503-3	640503-4
20	.063	640504-1	640504-2
	.130	640504-3	—
24	.063	640505-1	640505-2
36	.063	640506-1	640506-2
	.130	—	640506-4

Accessories (MR Connectors)

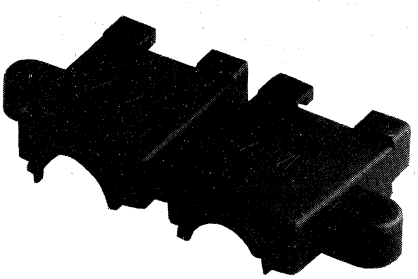
Keying Plug

Material:
Nylon, natural

Part Number 350591-1

Strain Relief One Piece, Clam Shell

Material:
Nylon, 94V-2 rated, black



Number of Circuits	Part Numbers
6	1-350373-9
12	1-350374-9

Note: These strain reliefs can be used with either pin or socket housings.

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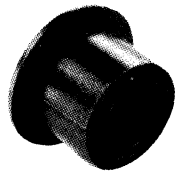
AMP

Adapting Grommet for Strain Relief

Material:

Flexible PVC (55/75 Durometer), black



Number of Circuits	Inside Diameter	Part Numbers
6	.156	1-350377-0
	.218	1-350376-0
	.296	1-350375-0
9, 12 & 15	.218	1-350378-1
	.250	1-350379-1
	.281	1-350380-1
20, 24 & 36	.437	1-380935-0
	.375	1-380936-0
	.312	1-380937-0

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AMP Incorporated, Harrisburg, PA 17105

AMP

Miniature Ribbon Connectors (CHAMP)

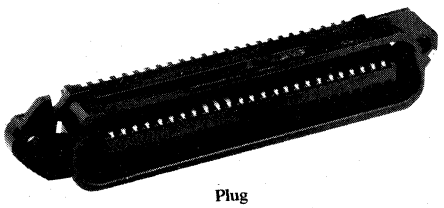
■ Recognized under the Component Program of Underwriters Laboratories Inc. File No. E28476 ®

Insulation Displacement Cable-to-Cable Connectors

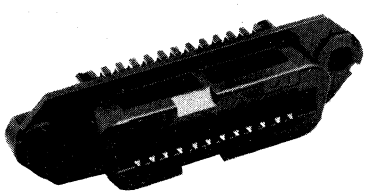
Material and Finish:

Housing — Thermoplastic, oxygen index 28% minimum
Terminal — High-strength copper alloy, selectively plated gold over nickel in contact area

Style PS — Plug, screwlock (thick flange)
Style PB — Plug, bail lock
Style RS — Receptacle, screw or bail lock (thick flange)
Style RP — Receptacle, panel mount, screw or bail lock (thin flange)



Plug



Receptacle

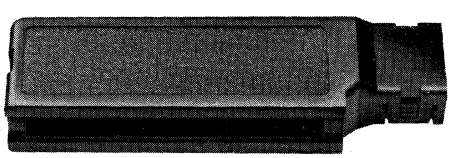
No. of Pos.	Wire Size (AWG)		Housing Color Dot Designation	Contact Letter Designation	Part Numbers			
					Plug		Receptacle	
	Solid	7 Strand			Style PS	Style PB	Style RS	Style RP
24	24-26	24	Blue	B	552283-1	552272-1	552313-1	—
36					552284-1	552274-1	552314-1	—
50					229974-1	552032-1	229975-1	2-552001-1
36	—	26-27-28	Yellow	E	—	552470-1	—	—
50					552390-1	—	552391-1	—

Note: Acceptable wire insulations are polyvinyl chloride (PVC), polyethylene, irradiated polyethylene, and polypropylene. Maximum insulation diameter is .045″ for tools that mass terminate conductors on one side at a time and .043″ for tools that insert one conductor per side at a time.

Insulation Displacement Connector Accessories 90° Tapered Slide-On Strain Relief Cover Kit (For 50-Position Only)

Part Number 552560-1
(.350″-.425″ cable diameter)

Insulation Displacement Connector Accessories 90° Snap-On Strain Relief Cover



Material:

Thermoplastic, oxygen index 28% minimum

Number of Positions	Cable Diameter Range	Part Numbers
24	.250-.300	552413-1
36	.305-.360	552414-1
50	.340-.400	552014-1

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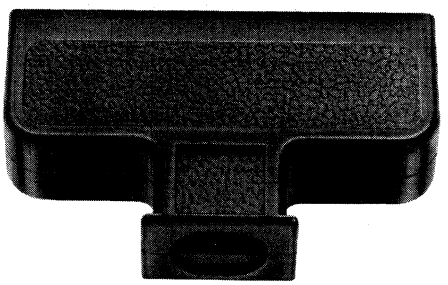
AMP

Insulation Displacement Connector Accessories
180° Snap-On Strain Relief Cover



Material:
Thermoplastic, oxygen index 28% minimum

Number of Positions	Cable Diameter Range	Part Numbers
24	.230-.280	552076-1
36	.290-.360	552073-1
	.360-.430	552073-5
50	.380-.430	2-552008-1
	.430-.490	552008-1

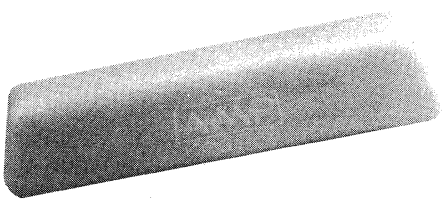
Insulation Displacement Panel-Mount Connector Accessories
Snap-On Strain Relief, Low Profile

Material:
Thermoplastic

Number of Positions	Part Numbers
24	1-552298-1
36	1-552297-1
50	1-552027-1

Note: Two required per connector assembly

Insulation Displacement Connector Accessories
Dust Covers



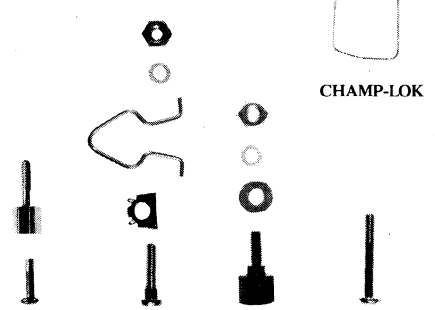
Material:
Thermoplastic

Number of Positions	Cover Part Numbers	
	Plug (Blue)	Receptacle (Red)
24	229968-4	229969-4
36	229968-3	229969-3
50	229968-1	229969-1

Hardware Kits

	Kit Part Numbers				
	Screw-lock	Bail Lock	CHAMP-LOK	IEEE-488	Miscellaneous
Insulation Displacement Connectors					
Cable-to-Cable	—	—	552723-1	—	—
Cable-to-Panel	552568-1	552567-1	—	—	—
	—	552567-3	—	—	—
Low-Profile, Cable-to-Cable	—	552561-3	—	—	—
Standard Pc Board Connectors					
Right-Angle, Rear Mount Only	552631-1	—	—	—	—
Right-Angle, Standard	—	—	—	552633-3	—
Vertical-Mount	552563-1	552562-1	—	—	—
Miscellaneous Hardware					
Captive Pan Head Screw (4-40)	—	—	—	—	229911-1

CHAMP-LOK



Screwlock Bail Lock IEEE-488 Miscellaneous

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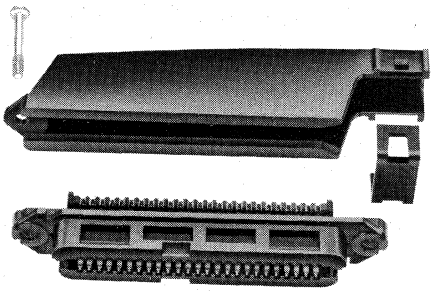
AMP

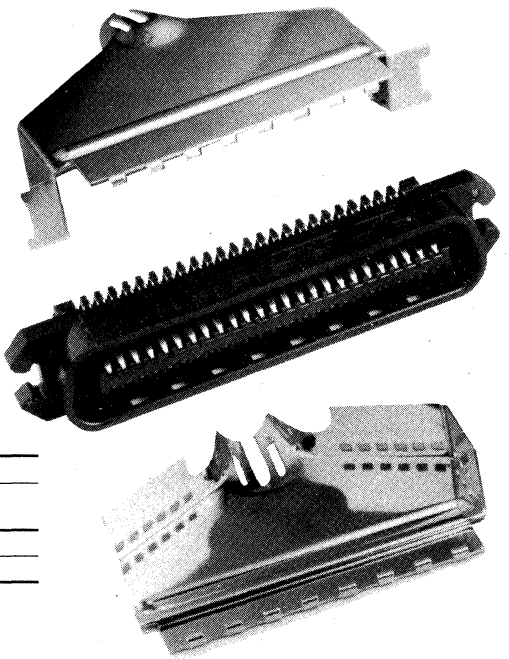
Miniature Ribbon Connectors (CHAMP)



Insulation Displacement Connectors
Cable-to-Cable Plug and Receptacle with Tapered Cover and Screw, 50-Positions

Material and Finish:
Housing — Thermoplastic, oxygen index 28% minimum
Terminal — High-strength copper alloy, selectively plated gold over nickel in contact area

Wire Size (AWG)		Housing Color Dot Designation	Contact Letter Designation	Cable Diameter Range	Kit Part Numbers	
Solid	7 Stranded				Plug	Receptacle
24-26	24	Blue	B	.350-.425	229976-1	229977-1

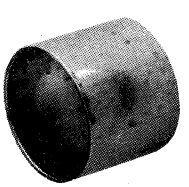


Insulation Displacement Connectors
Shielded Cable Connector Kits

Material and Finish:
Housing and Cover — Thermoplastic, black, oxygen index 28% minimum
Terminals — High-strength copper alloy, plated gold over nickel
Shield — Carbon steel, bright nickel plated
Strain Relief — Nylon, flame-retardant, black
Hardware — Steel, zinc plated

Number of Positions	Cable Diameter Range	Part Numbers	
		Shielded Plug Kit Bail Lock — E Slot	Cover Kits
36	.250-.500	554950-1	554945-1
50	.350-.625	554953-1	554946-1

Ferrules For Shielded Cable Connectors



Material:
Copper alloy

Inside Diameter	Part Numbers
.350	554725-3
.400	554725-4
.450	554725-5

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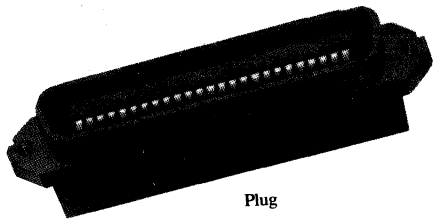
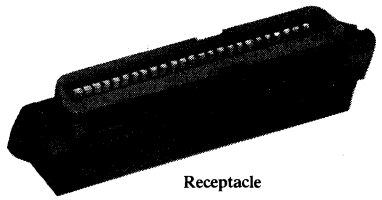
AMP

Insulation Displacement Connectors
Low Profile, Standard



Plug



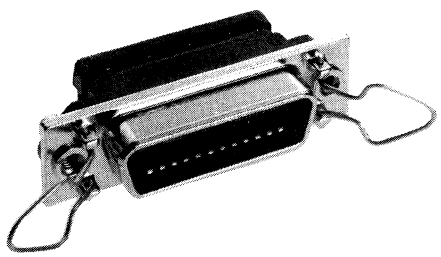
Receptacle

Material and Finish:

Housing — Thermoplastic, 94V-0 rated
Terminal — High-strength copper alloy, selectively plated gold over nickel in contact area

Number of Positions	Assembly Part Numbers			
	Bail Lock Plug	Screw Lock Plug	Screw Lock Receptacle	Panel Mount Receptacle
24	—	—	—	554088-1
36	554084-1	—	—	554089-1
50	—	553602-1	553603-1	554090-1

Shielded Panel-Mount Connectors
For .050″ Ribbon Cable



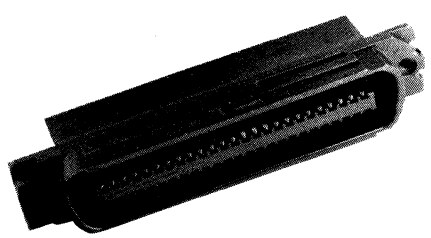
Material and Finish:

Housing & Strain Relief Clip — Thermoplastic, black
Terminals — High-strength copper alloy, plated gold over nickel on mating face and gold flash over nickel on terminating side
EMI Shield — Die casting, nickel plated

Number of Positions	Part Numbers	
	Loose Piece	Preassembled Bail Lock
24	554349-1	—
36	—	554346-2
50	—	554902-1*

*Does not have boss feature

Right-Angle Pc Board Connectors



Material and Finish:

Housing, Bracket, Plate, and Comb — Thermoplastic, 94V-0 rated, black
Terminal — High-strength copper alloy, selectively plated gold over nickel on mating end and tin plated on tails

Number of Positions	Part Numbers	
	Standard Orientation	
	Receptacle	Plug
24	552791-1*	—
36	552742-1	—
50	552725-1	552726-1

*For IEEE-488 applications

Note: Connectors have self-tapping mounting holes.

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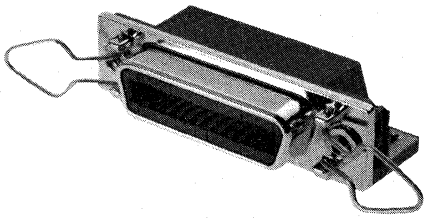
AMP

Miniature Ribbon Connectors (CHAMP)



Shielded Panel-Mount Pc Board Connectors Preassembled Right-Angle Bail Lock

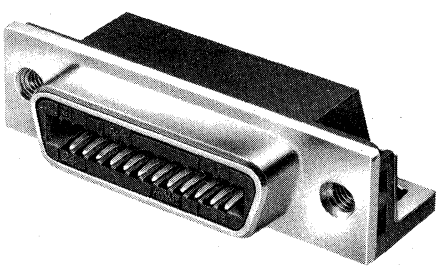
Material and Finish:

Housing, Bracket, Plate & Comb — Thermoplastic, 94V-0 rated, black
Terminals — High-strength copper alloy, selectively plated gold over nickel on mating face and tin plated on tails
EMI Shield — Die casting, nickel plated

Number of Positions	Part Numbers
36	553815-3
50	554901-1*

*Does not have boss feature.

Shielded Panel-Mount Pc Board Connectors Preassembled Right-Angle Screw Lock



Material and Finish:

Housing, Bracket, Plate & Comb — Thermoplastic, 94V-0 rated, black
Terminals — High-strength copper alloy, selectively plated gold over nickel on mating face and tin plated on tails
EMI Shield — Die casting, nickel plated

Part Number 553811-1 (24-Position)

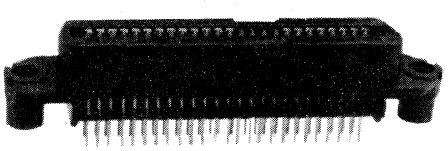
Vertical-Mount Pc Board Connectors

Material and Finish:

Housing — Thermoplastic, 94V-0 rated, black
Terminals — High-strength copper alloy, selectively plated gold over nickel on mating end and tin plated on tails

Number of Positions	Part Numbers	
	Plug Style PV	Receptacle Style RV
24	—	552224-1*
36	—	552235-1
50	552116-1	552118-1

*.189″ diameter mounting hole



CHAMP—Trademark of AMP Incorporated

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AMP Incorporated, Harrisburg, PA 17105

AMP

RF Coaxial Connectors

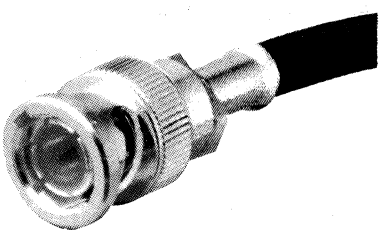
BNC Connectors

Material and Finish:
Brass per QQ-B-626
Beryllium copper per QQ-C-530
Phosphor bronze per QQ-B-750
Annealed copper per QQ-C-576
Polypropylene per LP-394
Polyethylene per LP-390
TEFLON per MIL-P-19468
VALOX per MIL-P-46160/LP-403
Silicone rubber per ZZ-R-765
Plating:
Silver per QQ-S-365
Gold per MIL-G-45204
Nickel per QQ-N-290
Zinc per QQ-Z-363
Tin-lead per ASTM-B-545
Passivate per QQ-P-35

Standard Single-Crimp BNC Plugs

Cable Type	Part Numbers	
	Polypropylene	TEFLON
RG-58, 58A, 58B, 58C	2-329066-1	2-329444-1
	2-329082-1	—
RG-59, 59A, 59B, 62, 62A, 62B, 124,140,210	2-329083-1	2-329445-1
RG-161,179,187	2-329084-1	2-329446-1
	—	331053
RG-55, 55A, 55B,223	2-329082-2	—
RG-174, 188	2-330061-1	2-330058-1
	—	331052
RG-178, 196	—	330876
Belden 8281 Western Electric 724 & 3049	330878	—

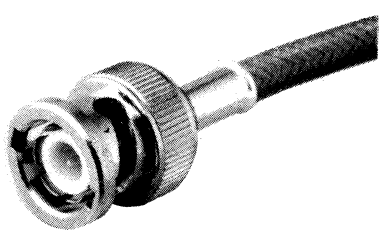
Note: Silver plate



Standard Dual-Crimp BNC Plugs

Cable Type	Part Numbers	
	Silver Plated	Tarnish Resistant Plated
RG-58, 58B	—	225395-1
RG-59, 59A, 59B	331350	225395-2
RG-142, 142A, 142B	—	225395-6
RG-174, 188	2-331350-4	225395-7
RG-179, 178	—	225395-8
RG-180, 180A, 195	2-331350-6	225395-9
Amphenol 21-597	—	1-225395-0

Note: Gold-plated center contact



TEFLON—Trademark of E.I. duPont, Inc.
VALOX—Trademark of General Electric Co.

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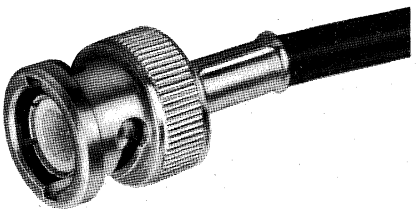
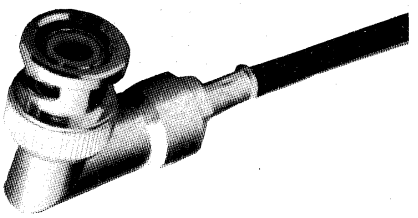
RF Coaxial Connectors

Commercial Dual-Crimp BNC Plugs

Cable Type	Part Numbers		
	Tin*	Gold*	Silver*
RG-58, 58A, 58B, 58C, 141, 141A	227079-1	227079-5	227079-9
RG-55, 55A, 55B, 223, 142, 142A, 142B	227079-2	227079-6	—
RG-59, 59A, 59B, 62, 62A, 62B	227079-3	227079-7	1-227079-1
RG-174, 188, 316	1-227079-4	1-227079-6	1-227079-5
RG-179, 187	2-227079-0	2-227079-2	2-227079-1
Amphenol 21-597 Belden 8218 Essex 2003	—	1-227079-9	—
Belden 9266	—	1-227079-3	—
Belden 9907	—	6-227079-7	—
Belden 88240, Berk-Tek BTDC-58	—	4-227079-3	—
HI-TEMP 62A, Belden 88241 Times PL 62 Berk-Tek BTDC 59 Berk-Tek BTDC 62	—	4-227079-9	—

*Center contact plating

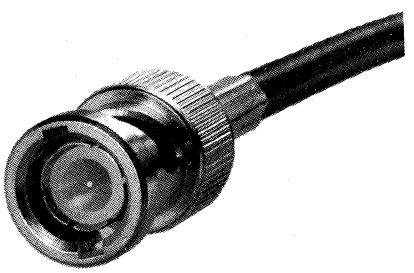




Standard Single-Crimp Right-Angle BNC Plugs

Cable Type	Part Numbers
RG-58, 58A, 58B, 58C	331175
Belden 8281, Western Electric 724 & 3049	50635

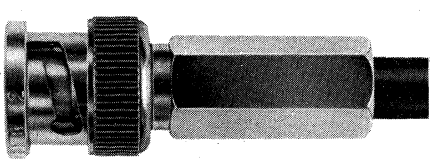
Note: TEFLON dielectric



Commercial Hex Crimp BNC Plug

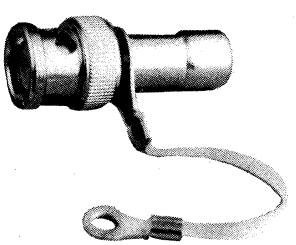
Cable Type	Part Numbers
RG-58, 58A, 58B, 58C, Belden 8218	1-221128-0
RG-59, 59A, 59B, 62, 62A, 62B Belden 8279, 9209	1-221128-1
Belden 8281, 9141	1-221128-2

Note: Gold plated center contact



Commerical Twist-On BNC Plug

Cable Type	Part Number
RG-59, 59A, 59B, 62, 62A	221984-1



Commercial BNC Terminator Plug

Resistor Specifications:
1 watt
50 ohms
1% tolerance

Part Number 221629-1 (with mounting strap)

Part Number 221629-4 (without mounting strap)

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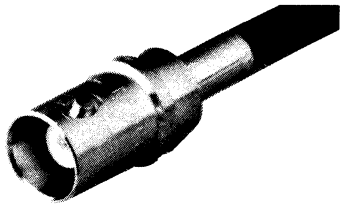
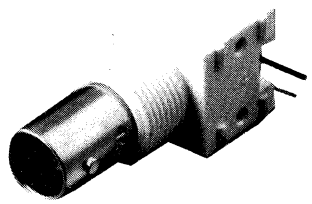
AMP

Standard Dual-Crimp BNC Jacks



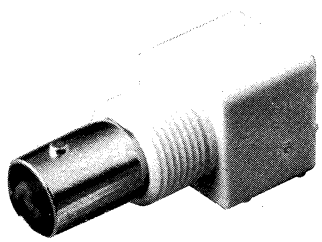
Cable Type	Part Numbers	
	Silver Plated	Tarnish Resistant Plated
RG-58, 58B,	—	225396-1
RG-59, 59A, 59B	331351	225396-2

Commercial Pc Board/Panel-Mount BNC Jacks



Style	Part Numbers		
	White Valox Body		
	Tin Contact	Silver Contact	Gold Contact
Right Angle Without Flanges Without Mounting Posts	226990-1	226990-5	226990-3
Right Angle Without Flanges With Mounting Posts	227161-1 227161-7*	227161-5	227161-3
Vertical Without Flanges Without Mounting Posts	226993-1	226993-5	226993-3
Vertical Without Flanges With Mounting Posts	227222-1	227222-5	227222-3
Right Angle with Flanges	226978-1	226978-5	226978-3
Vertical With Flanges	226987-1	—	—

*Low profile



Style	Part Numbers		
	Black Valox Body		
	Tin Contact	Silver Contact	Gold Contact
Right Angle Without Flanges Without Mounting Posts	226990-2	—	226990-6
Right Angle Without Flanges With Mounting Posts	227161-2	227161-4	227161-6
Vertical Without Flanges Without Mounting Posts	—	—	226993-6
Vertical Without Flanges With Mounting Posts	227222-2	227222-4	227222-6

Style	Part Numbers		
	Metal Body		
	Tin Contact	Silver Contact	Gold Contact
Right Angle Without Flanges Without Mounting Posts	—	227678-1	227676-1
Right Angle Without Flanges With Mounting Posts	227661-1	227679-1	227677-1
Vertical Without Flanges Without Mounting Posts	—	—	—
Vertical Without Flanges With Mounting Posts	227671-1	227675-1	227673-1

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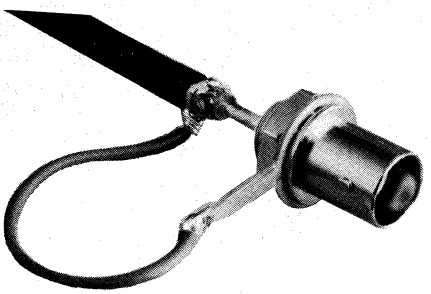
RF Coaxial Connectors

Commercial Panel Solder BNC Jacks — Short Body



Contact Plating	Dielectric	Part Numbers	
		Without Solder Terminal*	With Solder Terminal**
Tin	VALOX	227754-1	227755-1
Gold	VALOX	—	227755-2
Gold	TEFLON	—	227716-3

*Includes lockwasher and jam nut
**Includes solder terminal and jam nut

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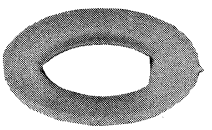
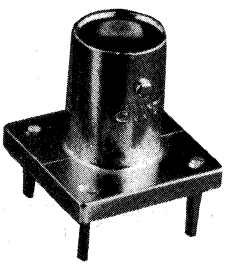
VALOX—Trademark of General Electric Co.

Nylon Insulating Bushing For Commercial Panel Solder Jacks



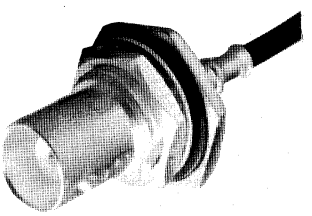
Part Number 227223-1

Commercial Vertical Metalized Pc Board-Mount BNC Jacks



Plating	Part Numbers
Silver	227699-1
Gold	227699-2
Tin	227699-3

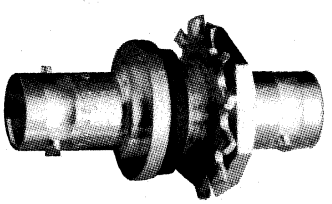
Standard Single-Crimp Bulkhead BNC Jacks



Cable Type	Part Number
RG-174, 188	2-330063-1

Note: TEFLON dielectric

Standard Bulkhead BNC Jack Adapter



Part Number 330024

Panel Insulating Bushing For Standard Single-Crimp and Dual-Crimp Bulkhead Jacks and Bulkhead BNC Jack Adapters

Part Number 330620 (two required)

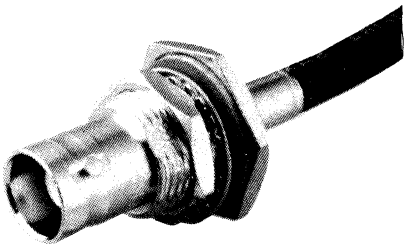
Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

AMP

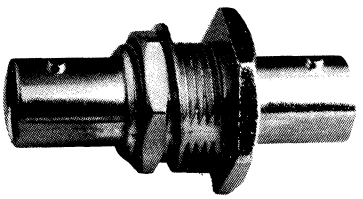
Standard Dual-Crimp Bulkhead BNC Jacks

Cable Type	Part Numbers	
	Silver Plated	Tarnish Resistant Plated
RG-58, 58A, 58B, 58C	—	225398-1
RG-59, 59A, 59B	—	225398-2
RG-174, 188	—	225398-7
RG-179, 187	1-331693-3	225398-8
Brand Rex T209A IBM 535914	2-331693-5	—
RG-62, 62A, 62B	331693	—



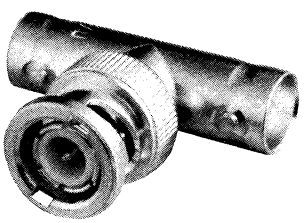
Commercial Bulkhead BNC Jack Adapter

Part Number 228226-1 (Gold-plated center contact)



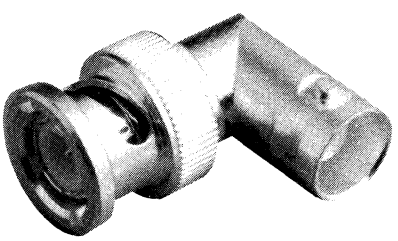
BNC Tee Adapter

Part Number 329518



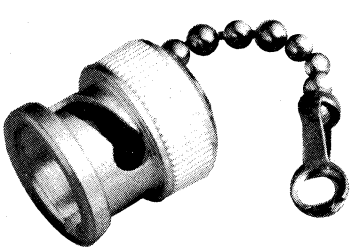
BNC Right-Angle Adapter

Part Number 329517



BNC Jack Cover

Part Number 330022



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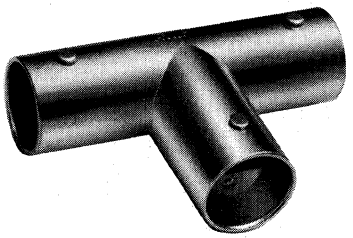
AMP

RF Coaxial Connectors

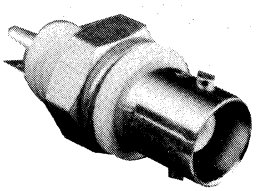
Twin BNC T-Adapter

Part Number 228833-1



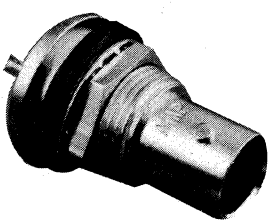
Commercial Isolated BNC Solder Receptacle

Finish	Part Numbers
Tin	227726-1
Silver	227726-2
Gold	227726-3



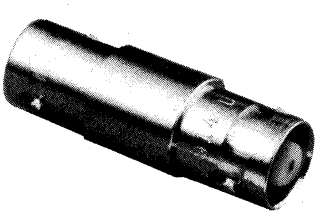
Commercial Sealed BNC Solder Receptacle

Part Number 227426-1



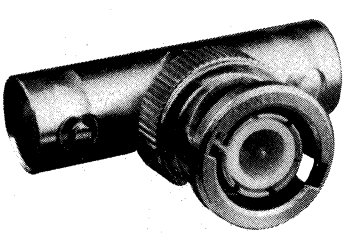
Jack-to-Jack In-Line BNC Splice

Part Number 221551-3



BNC Tee Connector

Part Number 221543-2



Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

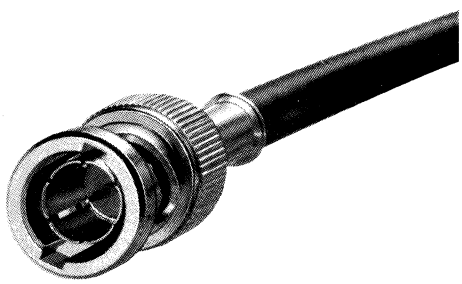
AMP

BNC Tee Insulating Cover (Short)

Part Number 221586-1

Commercial Dual-Crimp 75-Ohm BNC Plug

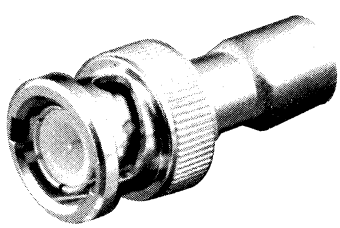
Cable Type	Part Numbers
Belden 8218	221185-3
Belden 8281	221185-5
Belden 9248	221185-1
RG-179, 179A, 179B 187, 187A	221185-8
RG-59	221185-2



Commercial 75-Ohm BNC Terminator Plug

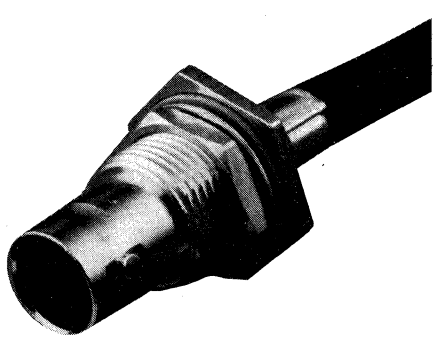
Resistor Specifications:
1 watt
75 ohms
1% tolerance

Part Number 221629-5



Commercial Dual-Crimp Bulkhead 75-Ohm BNC Jack

Cable Type	Part Numbers
RG-59	221221-2
RG-179, 179A, 179B, 187, 187A	221221-5



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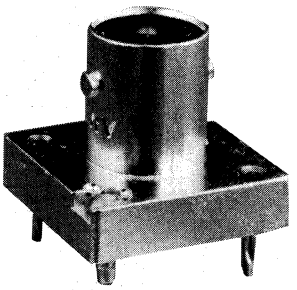
RF Coaxial Connectors

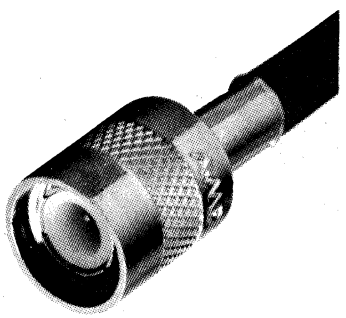
Commercial Pc Board ACTION PIN 75-Ohm BNC Receptacle

Part Number 221336-1



TNC Connectors

Material and Finish:
Brass per QQ-B-626
Polyethylene per LP-390
Silicone rubber per ZZ-R-765
Plating:
Silver per QQ-S-365
Gold per MIL-G-45204
Nickel per QQ-N-290

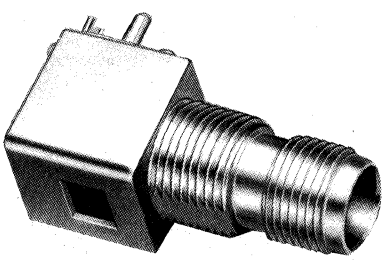


Commercial Dual-Crimp TNC Plugs

Cable Type	Part Numbers		
	Center Contact Plating		
	Tin	Gold	Silver
RG-58, 58A, 58B, 58C, 141, 141A	227000-1	227000-5	—
RG-59, 59A, 59B, 62, 62A, 62B	227000-3	227000-7	1-227000-1

Commercial Right-Angle Pc Board/Panel-Mount TNC Jacks (With Metal Body and Mounting Posts, Without Flanges)

Part Number 227839-1 (Gold-plated contact)



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AMP

Twin-Ax Interconnection System

Material and Finish:

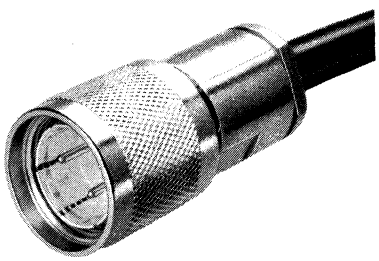
Brass per MIL-C-50, ASTM B-136, QQ-B-626
Beryllium copper per QQ-C-530, QQ-C-533
Annealed copper per QQ-C-576
Phosphor bronze per ASTM B-140 (QQ-B-750)
Silicone rubber per ZZ-R-765
Nylon per MIL-M-20693A Type I
TEFLON TFE per MIL-P-19468A

Plating:

Silver per QQ-S-365
Gold per MIL-G-45204
Nickel per QQ-N-290
Copper per MIL-C-14550
Zinc per QQ-Z-363
Tin per MIL-T-10727

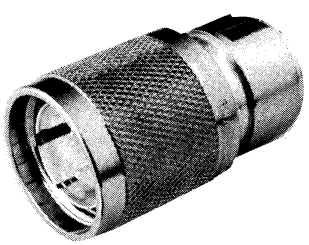
Cable Plug

Part Number 227241-1



Bulkhead Jack (Front Mount)

Part Number 226968-1 (Brass Shell)
Part Number 228284-1 (Zinc Shell)

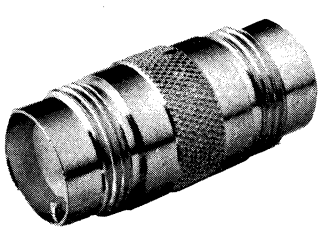


Terminator (Resistor)

Part Number 227504-1

Cable Splice

Part Number 227502-1



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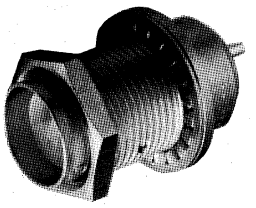
AMP

RF Coaxial Connectors

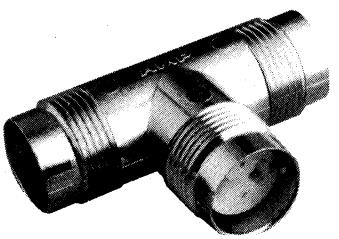
Bulkhead Jack (Rear Mount)

Part Number 227596-1 (Brass Shell)
Part Number 228523-1 (Zinc Shell)



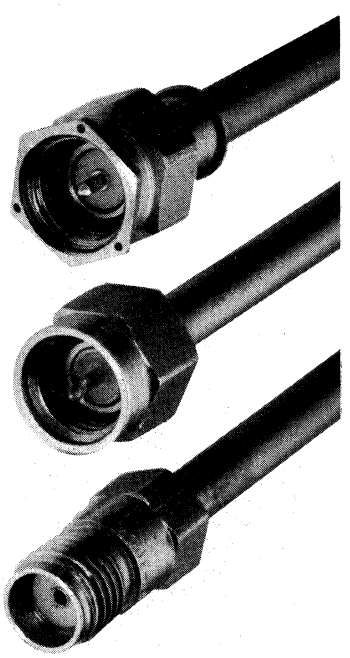
T-Adapter

Part Number 221436-1



SMA Connectors

Materials and Finish:
Beryllium copper per QQ-C-530
Stainless steel per ASTM-A-582
TEFLON TFE per MIL-P-19468
Brass per QQ-B-626
Silicone rubber per ZZ-R-765
Platings:
Gold per MIL-G-45204
Tin per MIL-T-10727
Nickel per QQ-N-290



SMA Connectors for Semirigid Cable (Mil Qualified)

Cable Type	Connector Type	Part Numbers		
		AMP	Category B	Category F
.086 OD (RG-405) 26.5 GHz	Plug**	—	227868-1	228639-1
	Short Plug**	221447-1	—	—
	Short Plug** (Weatherproof)	221812-1	—	—
	Right-Angle Plug	—	—	228583-1
.141 OD (RG-402) 26.5 GHz	Plug**	228634-2*	227743-1	—
	Plug***	—	227531-1	228635-1
	Sealed Plug	221329-1	—	—
	Jack	—	227744-1	228636-1
	Bulkhead Jack	—	227746-1	—

*Gold plated; all others passivated
**With center contact
***Without center contact

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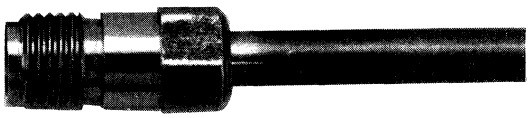
SMA Connectors for Semirigid Cable (Mil Qualified)

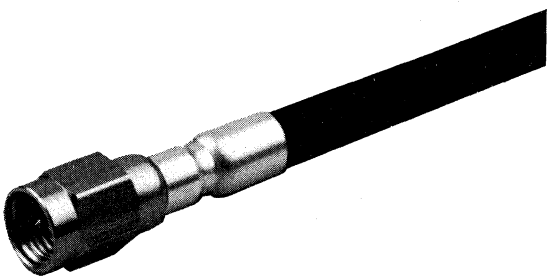
Cable Type	Connector Type	Part Numbers
.086 OD (RG-405)	Jack	227869-1
	Bulkhead Jack	227871-1

Note: Passivated finish



SMA Connectors for Flexible Cable (Mil Qualified)

Cable Type	Plug Part Numbers
RG-58A, 58C	225532-1
RG-142, 142A, 142B	225532-3
RG-174, 188A, 316	225532-4
RG-55A, 223	1-225532-0



SMB Connectors

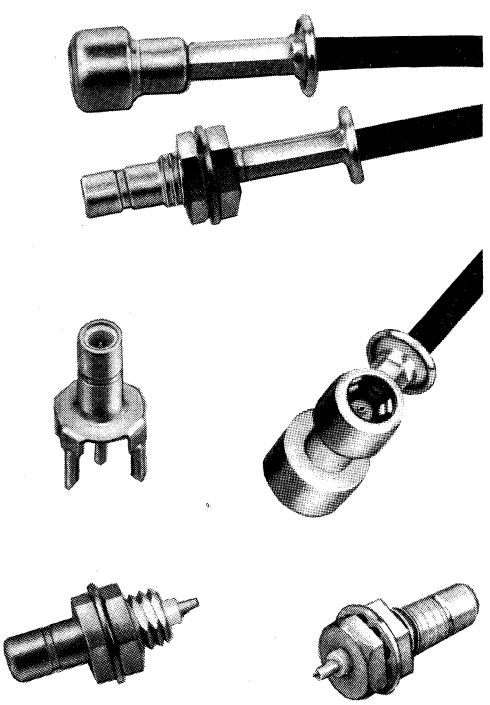
Materials and Finish:

Brass per QQ-B-626
Beryllium copper per QQ-C-530
TEFLON per MIL-P-19468A
Copper per QQ-C-576
Polypropylene — general purpose

Plating:

Gold per MIL-G-45204B
Nickel QQ-N-290

Connector Description	Cable Type	Part Numbers
Plug	RG-174, 188, 316	228213-1
Right-Angle Plug	RG-178, 196	228214-2
Bulkhead Jack	RG-174, 188, 316	228217-1
Vertical-Mount PCB Receptacle	—	221111-1
Right-Angle PCB Receptacle	—	228435-1
Front-Mount Solder Receptacle	—	228216-1
Rear-Mount Solder Receptacle	—	228215-1



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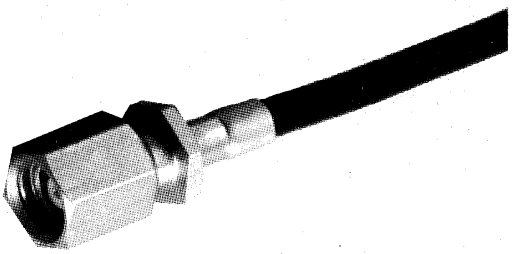
AMP

RF Coaxial Connectors

SMC Plug Connectors

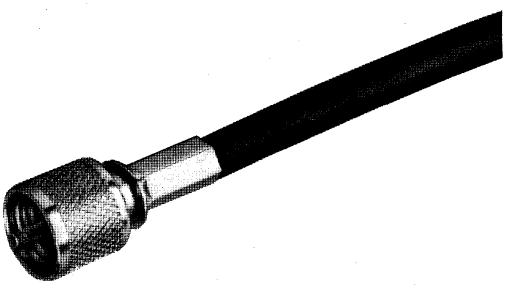


Materials and Finish:
Brass per QQ-B-626
Beryllium copper per QQ-C-530
TEFLON per MIL-P-19468A
Plating:
Gold per MIL-G-45204
Nickel per QQ-N-290

Cable Type	Part Number
RG-174, 188, 316	51749-1

Note: Gold-plated body

UHF Series Miniature Connectors

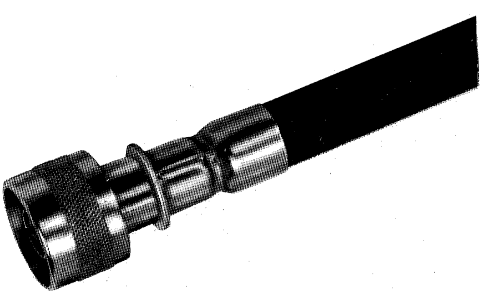


Material and Finish:
Brass per MIL-C-50 and QQ-B-626
Zinc per QQ-Z-363
Polypropylene — General purpose
TEFLON per MIL-P-19468A
Plating:
Bright Nickel per QQ-N-290
Tin per MIL-T-10727
Copper per MIL-C-14550
Gold per MIL-G-45204B

Connector Type	Cable Type	Part Numbers
Plug	RG-58, 58A, 58B, 58C	226600-1
Solderable Panel Jack	—	226601-1

N Series Connectors

Material and Finish:
Brass per MIL-C-50 and QQ-B-626
Phosphor bronze per QQ-B-750
Copper per QQ-C-576 and ASTM-B188
TEFLON per MIL-P-19468A
Silicone rubber per ZZ-R-765
Plating:
Nickel per QQ-N-290
Silver per QQ-S-365
Gold per MIL-G-45204B



Commercial Dual-Crimp Plug Connectors

Cable Type	Part Numbers
RG-8, 8A, 213	1-227086-0
	225661-2*
RG-9, 214	1-227086-1

Note: Gold-plated center contact
*Standard series with tarnish resistant finish

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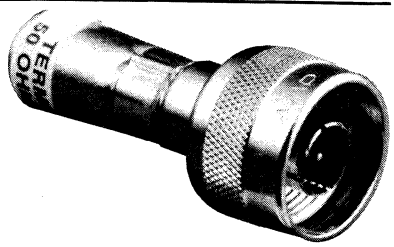
Commercial N Series Terminators

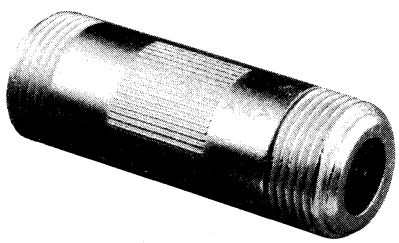
Type	Part Numbers
Plug	227953-1
Jack	227997-1



Resistor Specifications:
1 watt
50 ohms
1% tolerance

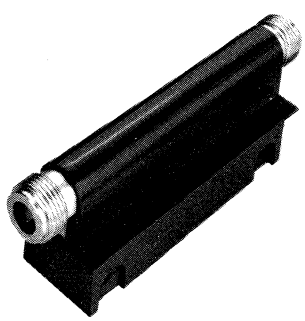
Commercial Feed-Through N Series Jack

Part Number 227945-2 (Gold plated)



N Series Transceiver Adapter

Part Number 221914-1



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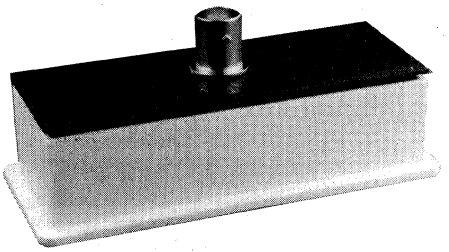
RF Coaxial Connectors

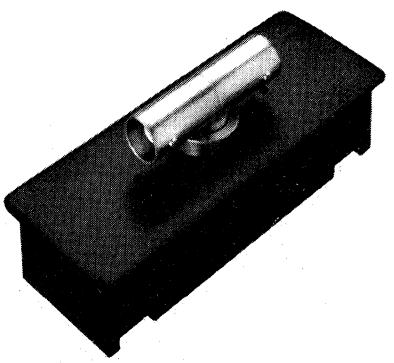
Commercial Vertical BNC Jack Adapter

Part Number 222455-1



Transceiver Adapter

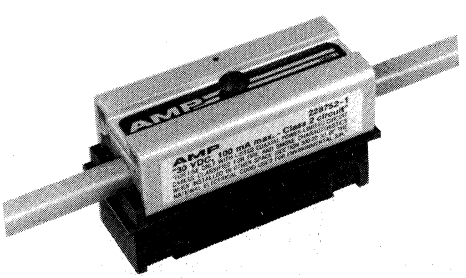
Part Number 221918-1



Low-Profile Coaxial Tap

Kit Part Number 228752-1
(Tap accepts coaxial cable with .370″ to .410″ diameter and 10-14 AWG solid center conductor.)

Replacement Probe Set **Part Number 228884-1**
(Probe set includes one probe assembly, two braid terminators, and one clamp screw.)



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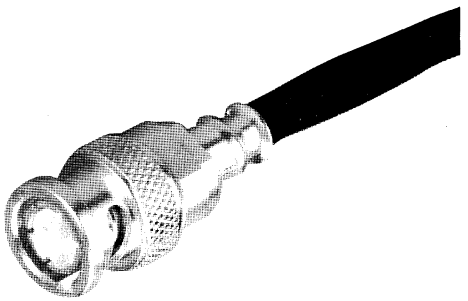
AMP

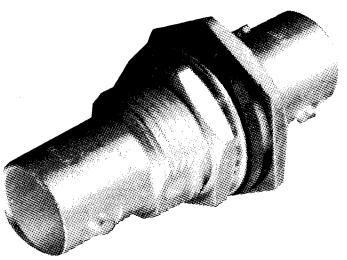
Twin BNC Connectors

Materials and Finish:
Brass per QQ-B-626
Beryllium copper per QQ-C-530
TEFLON per MIL-P-19468A
Annealed copper per QQ-C-576
Phosphor bronze per QQ-B-750
Silicon rubber per ZZ-R-765
Plating:
Silver per QQ-S-365



Twin BNC Plugs

Cable Type	Part Numbers
RG-108, 108A	332225
Raychem 7824, DO130	332225-1



Twin BNC Adapter

Part Number 332215

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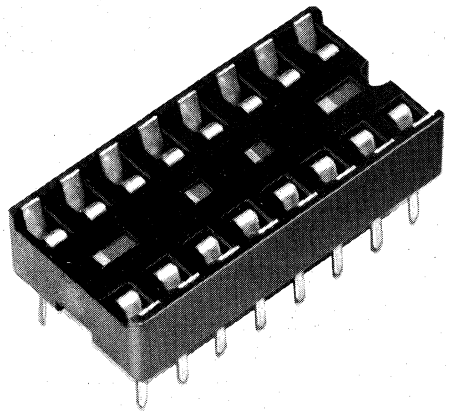
AMP

IC Sockets (DIP, SIMM, HPT, PGA)

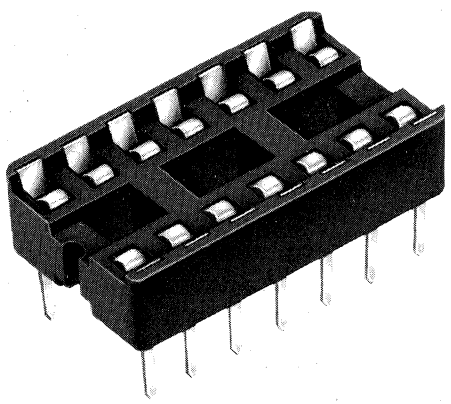


Dual Leaf Contact DIP Sockets (Closed Frame)

Material and Finish:

Housings — Glass-filled thermoplastic, 94V-0 rated, black
Contacts — Tin-lead plated

Number of Positions	Part Numbers			
	Sockets with Straight Solder Tails		Sockets with Retention Feature	
	Beryllium Copper	Phosphor Bronze	Beryllium Copper	Phosphor Bronze
6	2-641296-1	2-641296-3	2-641259-1	2-641259-3
8	2-640463-1	2-640463-3	2-641260-1	2-641260-3
14	2-640357-1	2-640357-3	2-641261-1	2-641261-3
16	2-640358-1	2-640358-3	2-641262-1	2-641262-3
18	2-640359-1	2-640359-3	2-641263-1	2-641263-3
20	2-640464-1	2-640464-3	2-641264-1	2-641264-3
22	2-640360-1	2-640360-3	2-641265-1	2-641265-3
24	2-640361-1	2-640361-3	2-641266-1	2-641266-3
28	2-640362-1	2-640362-3	2-641267-1	2-641267-3
40	2-640379-1	2-640379-3	2-641268-1	2-641268-3



Dual Leaf Contact DIP Sockets (Open Frame)

Material and Finish:

Housings — Glass-filled thermoplastic, 94V-0 rated, black
Contacts — Tin plated

Number of Positions	Part Numbers			
	Sockets with Straight Solder Tails		Sockets with Retention Feature	
	Beryllium Copper	Phosphor Bronze	Beryllium Copper	Phosphor Bronze
14	2-641599-1	2-641599-3	2-641609-1	2-641609-3
16	2-641600-1	2-641600-3	2-641610-1	2-641610-3
18	2-641601-1	2-641601-3	2-641611-1	2-641611-3
20	2-641602-1	2-641602-3	2-641612-1	2-641612-3
22	2-641603-1	2-641603-3	2-641613-1	2-641613-3
24	2-641932-1	2-641932-3	2-641933-1	2-641933-3
24	2-641604-1	2-641604-3	2-641614-1	2-641614-3
28	2-641605-1	2-641605-3	2-641615-1	2-641615-3
32	2-644018-1	2-644018-3	—	—
40	2-641606-1	2-641606-3	2-641616-1	2-641616-3
48	2-643574-1	2-643574-3	2-643576-1	2-643576-3
64	643575-1	643575-3	643577-1	643577-3

Notes: **1.** 100″ x .300″ centers

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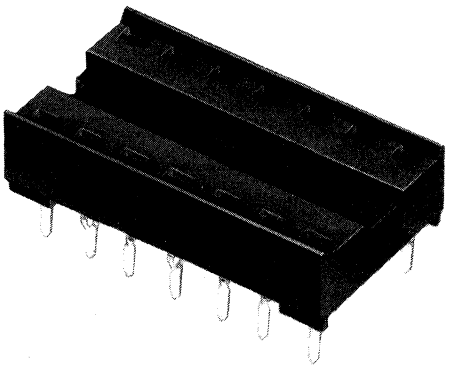
Single Leaf Contact DIP Sockets — Standard (Open Frame)

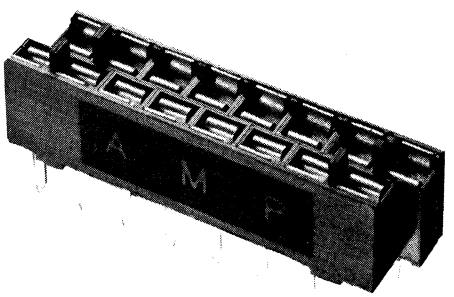
Material and Finish:

Housings — Glass-filled thermoplastic, 94V-0 rated, black
Contacts — Tin plated



No. of Pos.	Part Numbers							
	Sockets with Detent			Sockets without Detent			Flat Top with Detents	
	Beryllium Copper	Phosphor Bronze	Copper Alloy	Beryllium Copper	Phosphor Bronze	Copper Alloy	Beryllium Copper	Phosphor Bronze
8	2-641866-1	2-641866-3	2-641866-5	2-643290-1	2-643290-3	2-643290-5	—	—
14	2-641867-1	2-641867-3	2-641867-5	2-643291-1	2-643291-3	2-643291-5	—	—
16	2-641868-1	2-641868-3	2-641868-5	2-643292-1	2-643292-3	2-643292-5	—	—
18	2-641869-1	2-641869-3	2-641869-5	2-643293-1	2-643293-3	2-643293-5	—	—
20	2-641870-1	2-641870-3	2-641870-5	2-643294-1	2-643294-3	2-643294-5	—	—
22	2-641871-1	2-641871-3	2-641871-5	2-643295-1	2-643295-3	2-643295-5	—	—
24	2-641872-1	2-641872-3	2-641872-5	2-643296-1	2-643296-3	2-643296-5	643541-1	643541-3
28	2-641873-1	2-641873-3	2-641873-5	2-643297-1	2-643297-3	2-643297-5	643543-1	643543-3
40	2-641874-1	2-641874-3	2-641874-5	2-643298-1	2-643298-3	2-643298-5	—	—

Zig-Zag Package Sockets

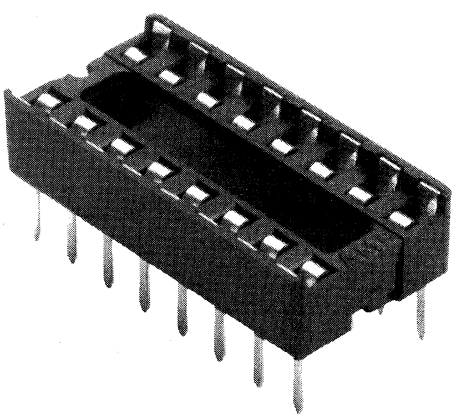


Material and Finish:

Housing — Glass-filled thermoplastic
Contacts — Phosphor bronze, pre-tin-lead plated

Number of Positions	Part Numbers
16	2-382006-3
20	2-382007-3
24	2-382008-3
28	2-382009-3

Over The Capacitor (OTC) DIP Sockets



Material and Finish:

Housing — Glass-filled thermoplastic, 94V-0 rated, black
Contacts — Phosphor bronze, tin-plated

Number of Positions	Part Numbers
16	2-644100-3
18	2-382060-3

Note: Sockets are packaged in tubes.

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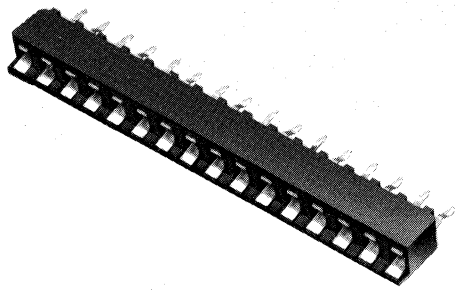
AMP

IC Sockets (DIP, SIMM, HPT, PGA)

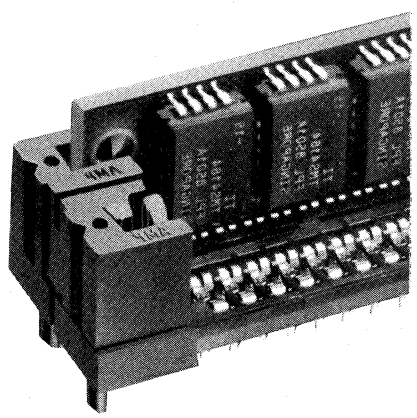
Dual Leaf Contact SIP Sockets



Material and Finish:

Housing — Glass-filled thermoplastic, 94V-0 rated, black
Contact — Tin plated

Number of Positions	Beryllium Copper	Phosphor Bronze
8	—	643640-3
10	—	643642-3
13	—	643645-3
14	643646-1	643646-3
15	—	643647-3
16	—	643648-3
17	643649-1	643649-3
18	—	643650-3
20	643652-1	643652-3
25	643657-1	—
30	—	643662-3



Standard Vertical SIMM Sockets

Materials and Finish:

Housing — Glass-filled polyphenylene sulfide, 94V-0 rated, or glass-filled liquid crystal polymer (LCP), 94V-0 rated
Contacts — Beryllium copper, plated tin-lead or .000030″ thick gold

Number of Positions	Part Numbers		
	Single Row Loose Piece		Double Row .300″ Centerline Slide Tray*
	Tin	Gold	Tin
30	643930-1	643930-2	2-382230-1
35	643935-1	—	—
42	643942-1	—	—

* Packaged in slide tray for robotic assembly.

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AMP Incorporated, Harrisburg, PA 17105

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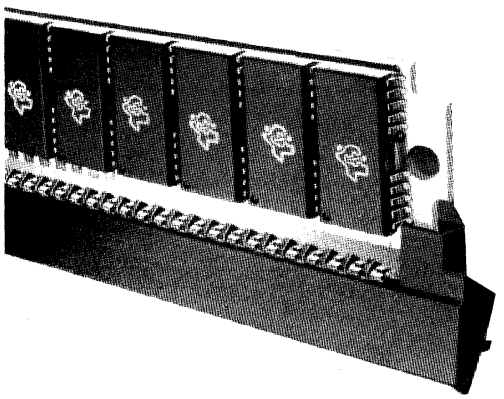
Low-Profile (Angled) SIMM Sockets

Materials and Finish:

Housing — Glass-filled polyphenylene sulfide, 94V-0 rated, or glass-filled liquid crystal polymer (LCP), 94V-0 rated
Contacts — Beryllium copper, plated tin-lead or .000030″ thick gold

Number of Positions	Part Numbers	
	Double-Row Slide Tray*	
	Tin	Gold
30	1-382130-1	2-382130-2

* Packaged in slide tray for robotic assembly.

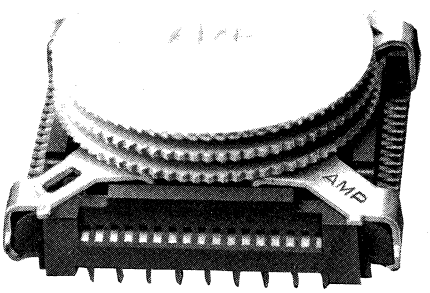


Square Low-Height Chip Carrier Sockets for LCCC Packages

Materials and Finish:

Housing — Glass-filled polyphenylene sulfide
Contacts — Beryllium copper, plated with gold over nickel in the substrate area and tin-lead over nickel in the solder tail area
Cover — Steel, tin-lead plated
Thruster Clip — Stainless steel

Number of Positions	Part Numbers	
	.140″ Leg Length	.110″ Leg Length
68	55159-1	55159-2

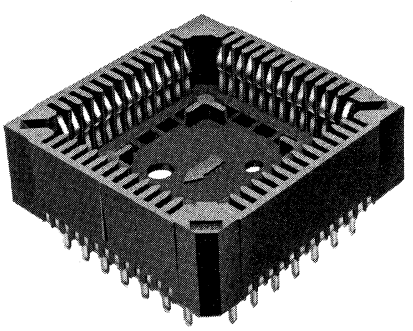


HPT Chip Carrier Sockets (Square Solder Tail Sockets)

Materials and Finish:

Housing — Polyphenylene sulfide, 40% glass-filled, 94V-0 rated, 220° C
Contacts — Phosphor bronze, plated 93% tin/7% lead over nickel on entire contact

Number of Postions	Part Numbers
44	821575-1
68	821574-1
84	821573-1



■ Recognized under the Component Program of Underwriters Laboratories Inc. ®

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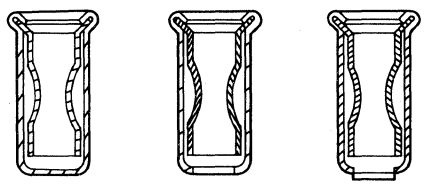
IC Sockets (DIP, SIMM, HPT, PGA)

Miniature Spring Sockets, Flat Bottom

Material and Finish:

Spring — Beryllium copper, tin or .000050″ thick gold plated
Eyelet — Copper, tin plated



Closed Bottom Open Bottom Knockout Bottom

Series 1 (Hole size $.041^{\pm .002}$ for semiautomatic insertion; $.040^{+.004}_{-.000}$ for hand insertion with commercially available pin vise)

Pin Diameter Range	Finish		Part Numbers		
	Spring	Eyelet	Closed Bottom	Open Bottom	Knockout Bottom
.010-.013	Tin	Tin	2-330808-1	—	3-330808-1
.013-.020	Gold	Tin	50935-1	50935-7	—
	Tin	Tin	50935-2	—	—
	Tin	Tin	2-330808-7	—	3-330808-7

Series 2 (Hole size $.052^{+.003}_{-.002}$ for semiautomatic insertion; $.052^{+.004}_{-.000}$ for hand insertion with commercially available pin vise)

Pin Diameter Range	Finish		Part Numbers		
	Spring	Eyelet	Closed Bottom	Open Bottom	Knockout Bottom
.018-.021	Gold	Tin	2-331272-3	—	—
	Tin	Tin	2-331272-1	—	2-331272-9
.014-.026	Gold	Tin	50863-5	50863-1	50863-3
	Tin	Tin	50863-8	50863-6	50863-7
.022-.025	Gold	Tin	2-331272-7	—	—
	Tin	Tin	2-331272-5	—	—
.014-.026	Gold	Tin	50462-8	50462-2	—
	Tin	Tin	50462-7	—	—

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Series 3 (Hole size .059-.062 for semiautomatic insertion; $.063^{+.004}_{-.000}$ for hand insertion with commercially available pin vise)

Pin Diameter Range	Finish		Part Numbers		
	Spring	Eyelet	Closed Bottom	Open Bottom	Knockout Bottom
.022-.025	Gold	Tin	—	2-331677-0	
	Tin	Tin	1-331677-6	1-331677-9	—
.026-.029	Gold	Tin	—	2-331677-4	—
	Tin	Tin	1-331677-0	—	—
.026-.033	Gold	Tin	50864-1	50864-5	50864-3
	Tin	Tin	50864-6	50864-8	50864-7
.030-.033	Gold	Tin	1-331677-8	2-331677-2	—
	Tin	Tin	1-331677-3	2-331677-1	—

Series 4 (Hole size $.072^{+.004}_{-.003}$ for semiautomatic insertion; $.072^{+.004}_{-.000}$ for hand insertion with commercially available pin vise)

Pin Diameter Range	Finish		Part Numbers		
	Spring	Eyelet	Closed Bottom	Open Bottom	Knockout Bottom
.030-.033	Gold	Tin	1-332070-9	2-332070-5	—
	Tin	Tin	1-332070-8	2-332070-4	—
.034-.037	Gold	Tin	—	2-332070-7	—
	Tin	Tin	—	2-332070-6	—
.034-.041	Gold	Tin	50865-5	50865-3	50865-1
	Tin	Tin	50865-8	50865-6	50865-7
.037-.040	Gold	Tin	2-332070-3	2-332070-9	—
	Tin	Tin	2-332070-2	2-332070-8	—

Series 5 (Hole size $.101^{\pm.003}$ for semiautomatic insertion; $.103^{+.004}_{-.000}$ for hand insertion with commercially available pin vise)

Pin Diameter Range	Finish		Part Numbers		
	Spring	Eyelet	Closed Bottom	Open Bottom	Knockout Bottom
.042-.049	Gold	Tin	50871-5	50871-1	—
	Tin	Tin	50871-8	50871-6	—
.050-.057	Gold	Tin	1-50871-4	1-50871-0	—
	Tin	Tin	1-50871-7	—	—
.056-.065	Gold	Tin	2-50871-3	1-50871-9	—
	Tin	Tin	2-50871-6	2-50871-4	

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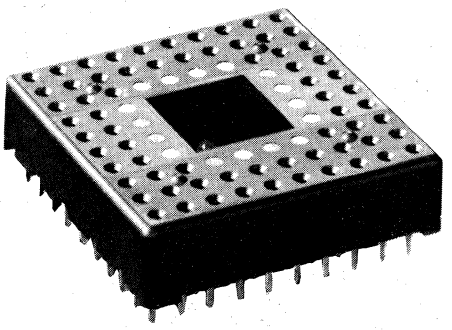
IC Sockets (DIP, SIMM, HPT, PGA)



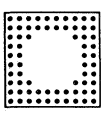
Square Sockets for PGA Packages
Low Insertion Force

Materials and Finish:

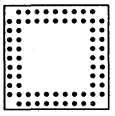
Housing — Glass-filled polyester

Contacts — Beryllium copper (LIF-P) or phosphor bronze (LIF-S), plated gold over nickel in the contact area and tin-lead over the solder leg

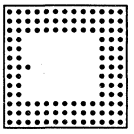
Configuration	Part Numbers	
	Beryllium Copper	Phosphor Bronze
10x10, 68 Positions	55270-3	916220-2
11x11, 68 Positions	55271-4	916221-3
13x13, 114 Positions (Type II)	55273-3	916223-3
13x13, 121 Positions	55273-2	916223-2
13x13, 124 Positions	55273-4	916223-4
13x13, 132 Positions	1-55273-4	1-916223-0
13x13, 133 Positions (Type I)	1-55273-2	916223-9
14x14, 132 Positions	55274-1	916224-1
15x15, 144 Positions	55275-1	916225-1
15x15, 145 Positions	55275-4	916225-3
15x15, 149 Positions (Type I)	55275-3	916225-2



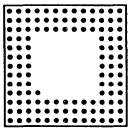
10x10, 68 Positions



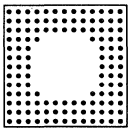
11x11, 68 Positions



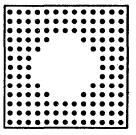
13x13, 114 Positions (Type II)



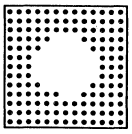
13x13, 121 Positions



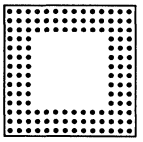
13x13, 124 Positions



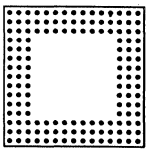
13x13, 132 Positions



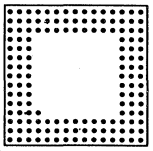
13x13, 133 Positions (Type I)



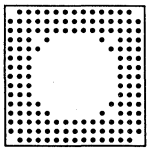
14x14, 132 Positions



15x15, 144 Positions



15x15, 145 Positions



15x15, 149 Positions (Type I)

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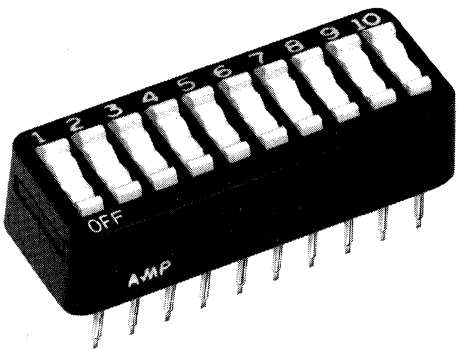
AMP

Printed Circuit Board Switches and Shunts

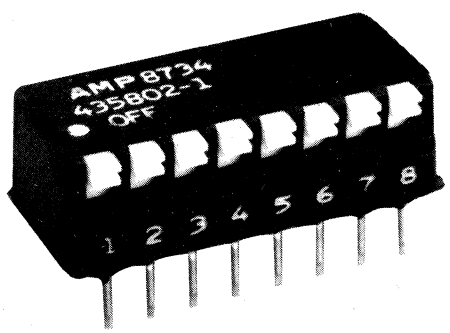


7000 Series DIP Switch
Single-Pole, Single-Throw
Standard Profile and Low Profile

Material and Finish:
Housing — Glass-filled polyester, 94V-0 rated, black
Rocker — Polyester, 94V-0 rated, white
Spring Contacts and Leads — Beryllium copper, with gold over nickel plating

Number of Switch Positions	Standard Profile		Low Profile	
	Unsealed*	Plastisol Sealed	Unsealed*	Tape Sealed
2	2-435166-9	4-435166-7	1-435626-9	3-435626-6
3	3-435166-0	—	2-435626-0	3-435626-7
4	435166-2	4-435166-9	435626-1	3-435626-8
5	435166-3	5-435166-0	435626-2	3-435626-9
6	435166-4	5-435166-1	435626-3	4-435626-0
7	435166-1	5-435166-2	435626-4	4-435626-1
8	435166-5	5-435166-3	435626-5	4-435626-2
9	435166-6	—	—	—
10	435166-7	5-435166-5	435626-7	4-435626-4
12	3-435166-2	—	—	4-435626-6

* All switches are bottom sealed.



7000 Series DIP Switch
Single-Pole, Single-Throw
Side Actuated

Material and Finish:
Housing — Glass-filled polyester, 94V-0 rated, black
Rocker — Polyester, 94V-0 rated, white
Spring Contacts and Leads — Beryllium copper, with gold over nickel plating

Number of Switch Positions	Part Numbers	
	Unsealed*	Plastisol Sealed
2	1-435802-0	1-435802-3
3	435802-2	1-435802-4
4	435802-3	1-435802-5
5	435802-4	1-435802-6
6	435802-5	1-435802-7
7	435802-6	1-435802-8
8	435802-1	435802-9
9	435802-7	1-435802-9
10	435802-8	2-435802-0
12	1-435802-2	2-435802-2

* All switches are bottom sealed.

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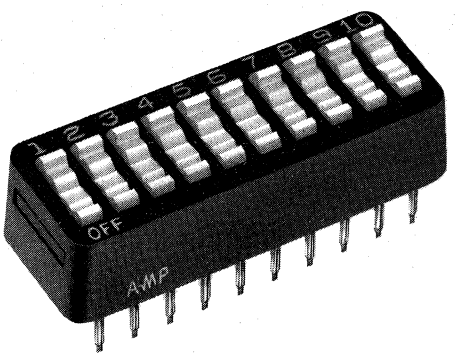
Printed Circuit Board Switches and Shunts

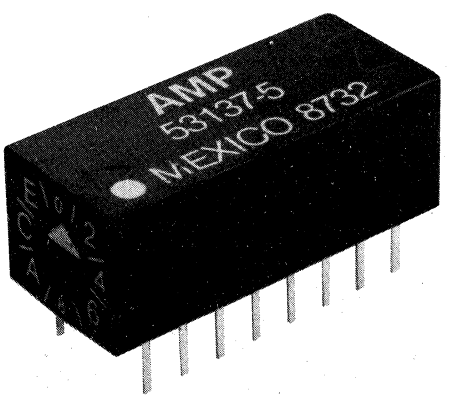


7100 Series DIP Switch
Single-Pole, Single-Throw
Standard Profile and Low Profile

Material and Finish:
Housing — Glass-filled polyester, 94V-0 rated, blue
Rocker — Polyester, 94V-0 rated, white
Spring Contacts and Leads — Copper alloy, with gold over nickel plating

Number of Switch Positions	Standard Profile		Low Profile	
	Unsealed*	Plastisol Sealed	Unsealed*	Tape Sealed
2	2-435640-9	3-435640-3	435668-1	—
3	3-435640-0	3-435640-4	435668-2	3-435668-3
4	435640-2	3-435640-5	435668-3	3-435668-4
5	435640-3	3-435640-6	435668-4	3-435668-5
6	435640-4	3-435640-7	435668-5	2-435668-5
7	435640-1	3-435640-8	435668-6	2-435668-7
8	435640-5	3-435640-9	435668-7	2-435668-8
9	435640-6	4-435640-0	—	2-435668-9
10	435640-7	4-435640-1	435668-9	3-435668-0
12	3-435640-2	4-435640-3	—	—

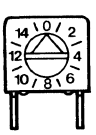
* All switches are bottom sealed.



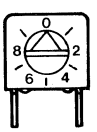
Preprogrammed Printed Circuit Board Switches

Stamping Legend

Style I

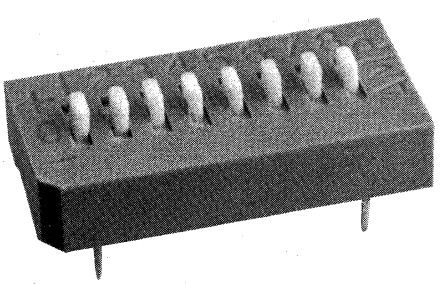


Style II



Style IV

Switch Type	Actuator	Stamping Legend Style	Switch Part Number
Hexadecimal W/Complement (16 Position)	Screwdriver Slot	I	53137-5
Hexadecimal W/Complement (16 Position)	Screwdriver Slot	II	53137-6
Hexadecimal W/Complement (16 Position)	Screwdriver Slot	I	54792-1
Hexadecimal W/Complement (16 Position)	Screwdriver Slot	II	54792-2
BCD W/Complement (10 Position)	Screwdriver Slot	IV	—
BCD W/Complement (10 Position)	Screwdriver Slot	IV	54778-1
Hexadecimal W/Complement (16 Position)	Extended Shaft	None	—
BCD W/Complement (10 Position)	Extended Shaft	None	—
Input/Output (2 Position)	Lever	—	—



Trinary Slide Switch, 7800 Series

Number of Positions	Part Numbers
8	436172-3
9	436172-2

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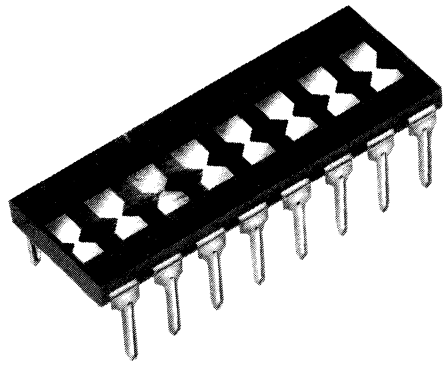
AMP

DIP Shunt

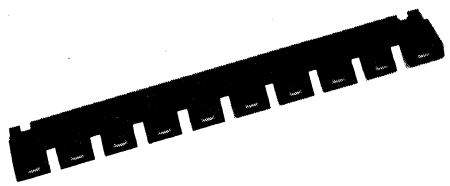


Material and Finish:

Housing — Glass-filled polyester, 94V-0 rated, UL recognized
Metal Parts — Copper alloy, electroplated tin finish

Number of Positions	Standard Shunt Standard Pressure	Machine Insertable Shunt
2	435704-2	—
4	435704-4	436860-3
5	435704-5	—
6	435704-6	—
7	435704-7	436860-6
8	435704-8	436860-7
9	435704-9	—
10	1-435704-0	436860-9
12	1-435704-2	—

2-Position Shunts



Low Profile Shunts
.100″ Centers

Part Number 531220-2 (.000015″ Gold[1] Plated Contacts)

Part Number 531220-3 (.000030″ Gold[1] Plated Contacts)

Part Number 531220-1 (.000100″ Tin Plated Contacts)

[1] In contact area.

Tandem Spring Shunts
.100″ Centers

Material:

Housing — Black

Part Number 3-530153-2 (.000015″ Gold[1] Plated Contacts)

Part Number 530153-2 (.000030″ Gold[1] Plated Contacts)

Part Number 2-530153-2 (.000100″ Tin Plated Contacts)

[1] In contact area.

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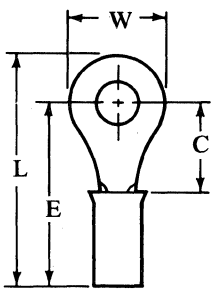
AMP

Terminals and Splices (PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND)

- PIDG, PLASTI-GRIP and SOLISTRAND terminals and splices are listed by Underwriters Laboratories Inc., UL 424C and certified by the Canadian Standards Association, LR 7189
- PLASTI-STRIP terminals (for stranded copper wire) are listed by Underwriters Laboratories Inc., E13288 and certified by the Canadian Standards Association, LR 47787

Ring Tongue Terminals
PIDG



Material:
Insulation — Nylon
Terminal — Copper per QQ-C-576, tin-plated per MIL-T-10727

Stud Size	Dimensions C Min	W	E Max	L Max	Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
AWG 26-22; CMA 202-810; Terminal Insulation: Yellow									
2	.121	.140	.452	.525	.082	.020	.029	323912	2-323912-1
4	.211	.203	.542	.646	.082	.020	.029	323914	2-323914-1
6	.211	.203	.542	.646	.082	.020	.029	323915	2-323915-2
8	.281	.250	.612	.740	.082	.020	.029	323916	2-323916-1
10	.281	.250	.612	.740	.082	.020	.029	324075	2-324075-1
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red									
4	.156	.218	.560	.672	.140	.033	.061	31880	2-31880-1
6	.250	.281	.654	.797	.140	.033	.061	36152	2-36152-1
8	.281	.312	.685	.844	.140	.033	.061	31890	2-31890-1
10	.281	.312	.685	.844	.140	.033	.061	36154	2-36154-2
¼	.437	.469	.841	1.078	.140	.033	.061	31894	2-31894-2
5/16	.437	.469	.841	1.078	.125	.033	.061	320572	2-320572-1
⅜	.546	.531	.950	1.218	.125	.033	.061	320573	2-320573-4
½	.530	.713	.934	1.293	.125	.033	.061	328975	—
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue									
4	.171	.250	.575	.703	.170	.033	.085	328996	2-328996-1
6	.171	.250	.575	.703	.170	.033	.085	320619	2-320619-1
8	.281	.343	.685	.859	.170	.033	.085	320565	2-320565-1
10	.281	.343	.685	.859	.170	.033	.085	36160	2-36160-1
¼	.437	.469	.841	1.078	.170	.033	.085	321045	2-321045-1
5/16	.437	.469	.841	1.078	.170	.033	.085	328998	2-328998-1
⅜	.546	.531	.950	1.218	.150	.033	.085	320564	2-320564-3
½	.530	.713	.934	1.293	.150	.033	.085	328976	—
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow									
4	.219	.281	.810	.953	.250	.042	.129	35148	—
6	.219	.281	.810	.953	.250	.042	.129	35149	2-35149-1
8	.302	.375	.893	1.083	.250	.042	.129	35108	2-35108-1
10	.302	.375	.893	1.083	.250	.042	.129	35109	2-35109-1
¼	.468	.531	1.054	1.322	.250	.042	.129	35110	2-35110-1
5/16	.468	.531	1.054	1.322	.250	.042	.129	35111	2-35111-1
⅜	.531	.593	1.115	1.414	.250	.042	.129	35112	—
½	.625	.750	1.216	1.594	.250	.042	.129	35151	—

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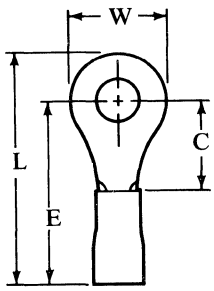
AMP Incorporated, Harrisburg, PA 17105

AMP

Ring Tongue Terminals
PLASTI-GRIP

Stud Size	Dimensions C Min	W	E Max	L Max	Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red									
4	.156	.218	.572	.684	.140	.033	.061	34141	2-34141-1
6	.250	.281	.666	.809	.140	.033	.061	34144	2-34144-1
8	.281	.312	.697	.856	.140	.033	.061	34148	2-34148-1
10	.281	.312	.697	.856	.140	.033	.061	34149	2-34149-1
¼	.437	.469	.853	1.090	.140	.033	.061	34150	2-34150-1
5/16	.437	.469	.853	1.090	.140	.033	.061	34151	2-34151-1
⅜	.546	.531	.962	1.230	.140	.033	.061	34152	2-34152-2
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue									
4	.171	.250	.587	.715	.170	.033	.085	34157	2-34157-1
6	.171	.250	.587	.715	.170	.033	.085	34158	2-34158-1
8	.281	.343	.697	.871	.170	.033	.085	34160	2-34160-1
10	.281	.343	.697	.871	.170	.033	.085	34161	2-34161-1
¼	.437	.469	.853	1.090	.170	.033	.085	34162	2-34162-1
5/16	.437	.469	.853	1.090	.170	.033	.085	34163	2-34163-1
⅜	.546	.531	.962	1.230	.170	.033	.085	34164	2-34164-2
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow									
4	.219	.281	.810	.953	.250	.042	.129	—	2-34835-1
6	.219	.281	.810	.953	.250	.042	.129	34852	2-34852-1
8	.302	.375	.893	1.083	.230	.042	.129	34169	2-34169-1
10	.302	.375	.893	1.083	.250	.042	.129	34854	2-34854-1
¼	.468	.531	1.059	1.327	.250	.042	.129	34855	2-34855-1
5/16	.468	.531	1.059	1.327	.230	.042	.129	34172	2-34172-1
⅜	.531	.593	1.122	1.421	.230	.042	.129	34173	2-34173-1
½	.625	.750	1.216	1.594	.250	.042	.129	34837	2-34837-4

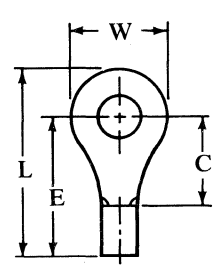
Materials:
Insulation — Vinyl
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727



Ring Tongue Terminals
SOLISTRAND

Wire Size Range AWG	Wire Size Range CMA	Stud Size	Dimensions C Min	W	E Max	L Max	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
22-16	509-3,260	4	.156	.218	.337	.449	.033	.061	34104	—
		6	.250	.281	.431	.574	.033	.061	34107	2-34107-2
		8	.281	.312	.462	.625	.033	.061	34111	2-34111-3
		10	.281	.312	.462	.625	.033	.061	34112	2-34112-2
		¼	.437	.469	.618	.855	.033	.061	34113	2-34113-2
		5/16	.437	.469	.618	.855	.033	.061	34114	—
		⅜	.546	.531	.727	.995	.033	.061	34115	—
		½	.530	.713	.711	1.070	.033	.061	329966	—
16-14	2,050-5,180	6	.171	.250	.352	.480	.033	.085	34120	2-34120-1
		8	.281	.343	.462	.636	.033	.085	34122	2-34122-1
		10	.281	.343	.462	.636	.033	.085	34123	2-34123-1
		¼	.437	.469	.618	.855	.033	.085	34124	2-34124-1
		5/16	.437	.469	.618	.855	.033	.085	34125	—
		⅜	.546	.531	.727	.995	.033	.085	34126	—
12-10	5,180-13,100	6	.219	.281	.487	.630	.042	.129	35476	2-35476-1
		8	.302	.375	.570	.760	.042	.129	32994	2-32994-1
		10	.302	.375	.570	.760	.042	.129	33457	2-33457-2
		¼	.468	.531	.736	1.004	.042	.129	33458	2-33458-3
		5/16	.468	.531	.736	1.004	.042	.129	33459	—
		⅜	.531	.593	.799	1.098	.042	.129	33220	—
		½	.625	.750	.893	1.273	.042	.129	35135	—

Material:
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727



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AMP Incorporated, Harrisburg, PA 17105

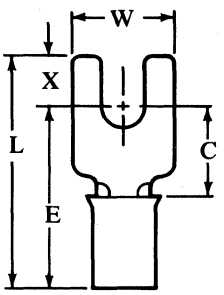
AMP

Terminals and Splices (PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND)

Spade Tongue Terminals
PIDG

Materials:
Insulation — Nylon
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727

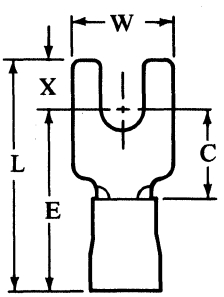
Stud Size	Dimensions C Min	W	E Max	L Max	X	Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red										
6	.312	.250	.716	.846	.125	.140	.033	.061	34541	2-34541-1
8	.312	.375	.716	.908	.187	.140	.033	.061	32053	2-32053-1
10	.312	.375	.716	.908	.187	.140	.033	.061	32054	2-32054-1
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue										
6	.203	.297	.607	.753	.141	.170	.033	.085	35559	2-35559-1
8	.312	.375	.716	.908	.187	.170	.033	.085	32059	2-32059-1
10	.312	.375	.716	.908	.187	.170	.033	.085	32060	2-32060-1
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow										
6	.218	.290	.809	.954	.140	.230	.042	.129	322985	1-322985-0
8	.296	.406	.887	1.095	.203	.230	.042	.129	32588	—
10	.296	.406	.887	1.095	.203	.230	.042	.129	32589	—



Spade Tongue Terminals
PLASTI-GRIP

Materials:
Insulation — Vinyl
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727

Stud Size	Dimensions C Min	W	E Max	L Max	X	Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red										
6	.203	.297	.619	.765	.141	.140	.033	.061	320665	2-320665-1
8	.312	.375	.728	.920	.187	.140	.033	.061	34155	2-34155-1
10	.312	.375	.728	.920	.187	.140	.033	.061	34156	2-34156-1
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue										
6	.203	.297	.619	.765	.141	.140	.033	.085	322994	2-322994-1
8	.312	.375	.728	.920	.187	.170	.033	.085	34166	2-34166-1
10	.312	.375	.728	.920	.187	.170	.033	.085	34167	2-34167-1
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow										
10	.296	.406	.887	1.095	.203	.230	.042	.129	34176	2-34176-1



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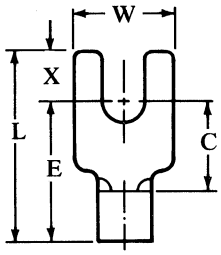
AMP Incorporated, Harrisburg, PA 17105

AMP

Spade Tongue Terminals
SOLISTRAND

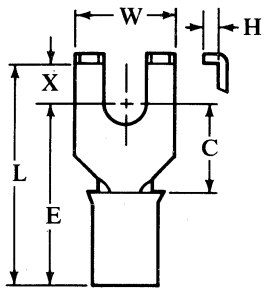
Materials:
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727



Wire Size Range		Stud Size	Dimensions					Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers	
AWG	CMA		C Min	W	E Max	L Max	X			Loose Piece	Tape Mounted
22-16	509-3,260	6	.203	.297	.384	.530	.141	.033	.061	36195	2-36195-3
12-10	5,180-13,100	6	.218	.290	.486	.631	.203	.042	.129	322451	—
		10	.296	.406	.564	.772	.203	.042	.129	33479	2-33479-1

Flanged Spade Tongue Terminals
PIDG

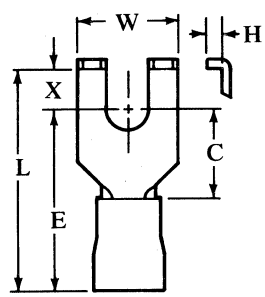
Materials:
Insulation — Nylon
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727



Stud Size	Dimensions						Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers	
	C Min	W	E Max	L Max	X	H				Loose Piece	Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red											
2	.203	.182	.607	.727	.115	.046	.140	.033	.061	324608	2-324608-1
6	.203	.296	.607	.737	.125	.046	.140	.033	.061	32562	2-32562-1
8	.250	.416	.654	.830	.171	.062	.140	.033	.061	32498	2-32498-1
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue											
6	.203	.294	.607	.737	.125	.052	.170	.033	.085	320861	2-320861-1
8	.203	.294	.607	.737	.125	.052	.170	.033	.085	320862	2-320862-1
10	.203	.294	.607	.737	.125	.052	.170	.033	.085	320863	—
AWG 12–10; CMA 5,180–13,100; Terminal Insulation: Yellow											
6	.250	.296	.841	1.017	.171	.062	.230	.042	.129	324577	—
8	.250	.416	.841	1.017	.171	.062	.230	.042	.129	32510	2-32510-1
10	.250	.416	.841	1.017	.171	.062	.230	.042	.129	326865	2-326865-1

Flanged Spade Tongue Terminals
PLASTI-GRIP

Materials:
Insulation — Vinyl
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727



Stud Size	Dimensions						Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers	
	C Min	W	E Max	L Max	X	H				Loose Piece	Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red											
6	.203	.296	.619	.749	.125	.046	.140	.033	.061	322249	1-322249-1
8	.250	.416	.666	.842	.171	.062	.140	.033	.061	324169	2-324169-1
10	.203	.296	.619	.749	.125	.046	.140	.033	.061	328516	2-328516-1
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue											
6	.203	.294	.619	.749	.125	.052	.170	.033	.085	324165	2-324165-1
8	.203	.294	.619	.749	.125	.052	.170	.033	.085	—	53874-2
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow											
6	.250	.296	.841	1.017	.171	.062	.230	.042	.129	324581	1-324581-1
8	.250	.416	.841	1.017	.171	.062	.230	.042	.129	324172	1-324172-0

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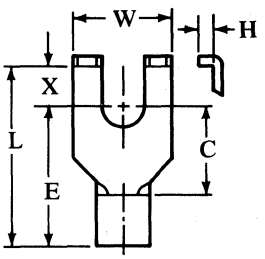
AMP Incorporated, Harrisburg, PA 17105

AMP

Terminals and Splices (PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND)

Flanged Spade Tongue Terminals
SOLISTRAND

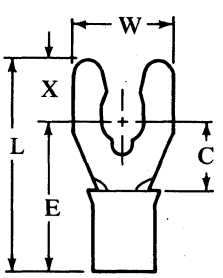
Material:
Terminal — Copper per QQ-C-576, tin plated per MIL-T-10727



Wire Size Range		Stud Size	Dimensions						Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers	
AWG	CMA		C Min	W	E Max	L Max	X	H			Loose Piece	Tape Mounted
22-16	509-3,260	2	.203	.182	.384	.504	.115	.046	.033	.061	324605	—
		6	.203	.296	.384	.514	.125	.046	.033	.061	320749	2-320749-2
16-14	2,050-5,180	6	.203	.294	.384	.514	.125	.052	.033	.085	320855	2-320855-1
		8	.203	.294	.384	.514	.125	.052	.033	.085	320856	2-320856-1

Short Spring Spade Tongue Terminals
PIDG

Materials:
Insulation — Nylon
Terminal — Phosphor bronze per QQ-B-750, tin plated per MIL-T-10727



Stud Size	Dimensions					Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers	
	C Min	W	E Max	L Max	X				Loose Piece	Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red										
4	.250	.203	.654	.799	.140	.125	.033	.061	52927	52927-1
6	.250	.250	.654	.799	.140	.125	.033	.061	52929	52929-1
8	.281	.375	.685	.860	.170	.125	.033	.061	52930	52930-1
10	.281	.406	.685	.908	.218	.125	.033	.061	52931	52931-1
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue										
6	.250	.250	.654	.799	.140	.170	.033	.085	52935	52935-1
8	.281	.375	.685	.860	.170	.170	.033	.085	52936	52936-1
10	.281	.406	.685	.908	.218	.170	.033	.085	52937	52937-1
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow										
6	.174	.250	.775	.959	.179	.250	.042	.129	52941	52941-1
8	.276	.375	.877	1.052	.170	.250	.042	.129	52942	52942-1
10	.276	.406	.877	1.100	.218	.250	.042	.129	52943	52943-1

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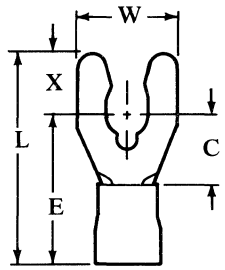
AMP

Short Spring Spade Tongue Terminals
PLASTI-GRIP

Materials:
Insulation — Vinyl
Terminal — Phosphor bronze per QQ-B-750, tin plated per MIL-T-10727

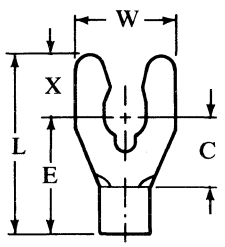
Stud Size	Dimensions C Min	W	E Max	L Max	X	Wire Insulation Diameter Maximum	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
AWG 22-16; CMA 509-3,260; Terminal Insulation: Red										
4	.250	.203	.666	.811	.140	.140	.033	.061	52947	52947-1
6	.250	.250	.666	.811	.140	.140	.033	.061	52949	52949-1
8	.281	.375	.697	.872	.170	.140	.033	.061	52950	52950-1
10	.281	.406	.697	.920	.218	.140	.033	.061	52951	52951-1
AWG 16-14; CMA 2,050-5,180; Terminal Insulation: Blue										
6	.250	.250	.666	.811	.140	.170	.033	.085	52955	52955-1
8	.281	.375	.697	.872	.170	.170	.033	.085	52956	52956-1
10	.281	.406	.697	.920	.218	.170	.033	.085	52957	52957-1
AWG 12-10; CMA 5,180-13,100; Terminal Insulation: Yellow										
6	.174	.250	.775	.959	.179	.200	.042	.129	52961	52961-1
8	.276	.375	.877	1.052	.170	.200	.042	.129	52962	52962-1
10	.276	.406	.877	1.100	.218	.200	.042	.129	52963	52963-1



Short Spring Spade Tongue Terminals
SOLISTRAND

Material:
Terminal — Phosphor bronze, per QQ-B-750, tin plated per MIL-T-10727

Wire Size Range AWG	Wire Size Range CMA	Stud Size	Dimensions C Min	W	E Max	L Max	X	Tongue Material Thickness Maximum	Barrel Inside Diameter Minimum	Part Numbers Loose Piece	Part Numbers Tape Mounted
22-16	509-3,260	4	.250	.203	.431	.576	.140	.033	.061	53175-1	—
		6	.250	.250	.431	.576	.140	.033	.061	53120-1	53120-2
16-14	2,050-5,180	6	.250	.250	.431	.576	.140	.033	.085	53123-1	53123-2
		8	.281	.375	.462	.637	.170	.033	.085	53124-1	53124-2
		10	.281	.406	.462	.685	.218	.033	.085	53125-1	53125-2
12-10	5,180-13,100	6	.174	.250	.491	.636	.179	.042	.129	53126-1	53126-2
		8	.276	.375	.554	.729	.170	.042	.129	53127-1	—
		10	.276	.406	.554	.777	.218	.042	.129	53128-1	—

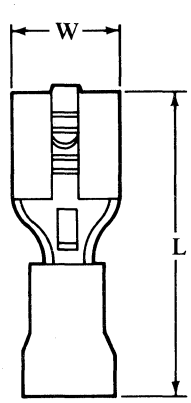


FASTON Receptacles
PIDG*

Materials:
Insulation — Nylon
Terminal — Brass, tin plated

Series	Wire Size AWG	Wire Size CMA	Dimensions W Nom	Dimensions L Max	Terminal Insulation Color	Wire Insulation Diameter Maximum	Stock Thickness	Fits Tab Thickness	Parts Numbers Loose Piece	Parts Numbers Tape Mounted
.250	22-18	509-1,900	.300	.900	Red	.140	.018	.032	640903-1	640903-2
	16-14	2,050-5,180	.300	.900	Blue	.170	.018	.032	640905-1	640905-2
	12-10	5,180-13,100	.300	1.012	Yellow	.250	.018	.032	640907-1	640907-2

*All receptacles have dimple with wire stop.



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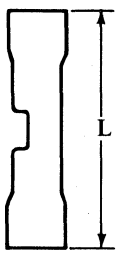
AMP

Terminals and Splices (PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND)

Butt Splices
PIDG — Standard

Materials:
Splice Body — Copper per QQ-C-576, tin-plated per MIL-T-10727
Insulation Sleeve — Nylon

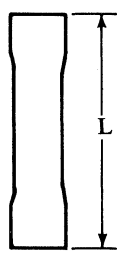


Wire Size		Dimension L Maximum	Splice Insulation Color	Wire Insulation Diameter Maximum	Barrel Inside Diameter Minimum	Parts Numbers	
AWG	CMA					Loose Piece	Tape Mounted
22-16*	509-3,260	1.265	Red	.125	.061	320559	2-320559-4
16-14	2,050-5,180	1.265	Blue	.150	.085	320562	2-320562-3
12-10	5,180-13,100	1.656	Yellow	.220	.129	320570	—

*22-16 splices are 22-18 range in accordance with MIL-T-7928.

Butt Splices
PLASTI-GRIP

Materials:
Splice Body — Copper per QQ-C-576, tin-plated per MIL-T-10727
Insulation Sleeve — Vinyl

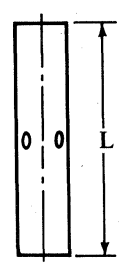


Wire Size		Dimension L Maximum	Splice Insulation Color	Wire Insulation Diameter Maximum	Barrel Inside Diameter Minimum	Parts Numbers	
AWG	CMA					Loose Piece	Tape Mounted
22-16*	509-3,260	1.065	Red	.140	.061	34070	1-34070-1
16-14	2,050-5,180	1.065	Blue	.170	.085	34071	2-34071-1
12-10	5,180-13,100	1.160	Yellow	.230	.129	34072	—

*22-16 splices are 22-18 range in accordance with MIL-T-7928.

Butt Splices
SOLISTRAND

Material:
Splice Body — Copper per QQ-C-576, tin-plated per MIL-T-10727



Wire Size		Dimension L Maximum	Barrel Inside Diameter Minimum	Parts Numbers
AWG	CMA			Loose Piece
22-16*	509-3,260	.591	.061	31818
16-14	2,050-5,180	.572	.085	31819
12-10	5,180-13,100	.567	.129	32151

*22-16 splices are 22-18 range in accordance with MIL-T-7928.

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AMP

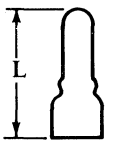
Closed End Splices

Materials and Finish:

Insulation — Nylon, translucent
Plating — Tin

Wire Size	CMA Range	UL Listed and CSA Certified	L Maximum	Opening Diameter Minimum	Insert Conductor	Splice Marking (Voltage & Temperature Rating Code)	Part Numbers	
							Loose Piece	Tape Mounted
22-14	509-5,180	300 Volt-105°C Maximum	.680	.250	Copper, Tin plated	ECN	35115	1-35115-0
22-10	3,248-13,100	300 Volt-105°C Maximum	.775	.375	Copper, Tin plated	ECN	35653	2-35653-1
22-10	3,248-13,100	600-1000 Volt-105°C Maximum*	.720	.375	Steel, Tin plated	EC	324067	2-324067-1

* Stranded wire only.

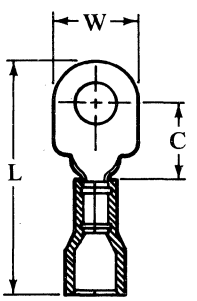


Ring Tongue Terminals
PLASTI-STRIP

Materials:

Terminal — Copper alloy, tin plated
Insulation — Nylon

Wire Size Range (AWG)	Ins. Dia. (Max.)	Insulation Color	Dimensions			Stud Size	Part Numbers (Strip Form)
			L	C	W		
22-18	.135	Red	.845	.281	.312	6	2-520608-2
						8	2-520611-2
						10	2-520614-2
16-14	.160	Blue	.865	.297	.312	6	3-520638-2
						8	3-520641-2
						10	3-520644-2
12-10	.225	Yellow	.909	.312	.375	6	4-520669-2
						8	4-520672-2
						10	4-520675-2

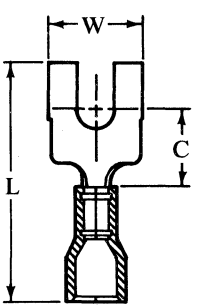


Spade Tongue Terminals
PLASTI-STRIP

Materials:

Terminal — Copper alloy, tin plated
Insulation — Nylon

Wire Size Range (AWG)	Ins. Dia. (Max.)	Insulation Color	Dimensions			Stud Size	Part Numbers (Strip Form)
			L	C	W		
22-18	.135	Red	.909	.312	.294	6	2-520617-2
					.375	8	2-520620-2
						10	2-520623-2
16-14	.160	Blue	.909	.312	.294	6	3-520647-2
					.375	8	3-520650-2
						10	3-520653-2
12-10	.225	Yellow	.909	.312	.375	6	4-520678-2
						8	4-520681-2
						10	4-520684-2



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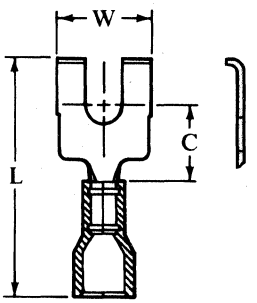
AMP

Terminals and Splices (PIDG, PLASTI-GRIP, PLASTI-STRIP, SOLISTRAND)

Flanged Spade Tongue Terminals
PLASTI-STRIP

Materials:
Terminal — Copper alloy, tin plated
Insulation — Nylon

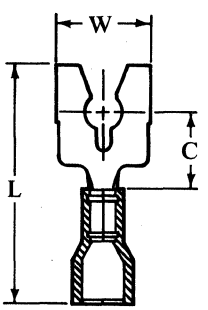
Wire Size Range (AWG)	Ins. Dia. (Max.)	Insulation Color	Dimensions L	C	W	Stud Size	Part Numbers (Strip Form)
22-18	.135	Red	.909	.312	.294	6	2-520569-2
					.375	8	2-520570-2
						10	2-520571-2
16-14	.160	Blue	.909	.312	.294	6	3-520572-2
					.375	8	3-520573-2
						10	3-520574-2
12-10	.225	Yellow	.909	.312	.375	6	4-520687-2
						8	4-520690-2
						10	4-520693-2



Spring Spade Tongue Terminals
PLASTI-STRIP

Materials:
Terminal — Copper alloy, tin plated
Insulation — Nylon

Wire Size Range (AWG)	Ins. Dia. (Max.)	Insulation Color	Dimensions L	C	W	Stud Size	Part Numbers (Strip Form)
22-18	.135	Red	.909	.312	.294	6	2-520629-2
					.375	8	2-520632-2
						10	2-520635-2
16-14	.160	Blue	.909	.312	.294	6	3-520659-2
					.375	8	3-520662-2
						10	3-520665-2
12-10	.225	Yellow	.909	.312	.375	6	4-520696-2
						8	4-520699-2
						10	4-520702-2



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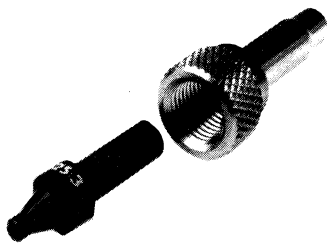
AMP

Electro-Optic Connectors (OPTIMATE)

Simplex Connectors For Multimode Fibers



Provide simple, low-loss (less than 1.5 dB) termination of glass fibers

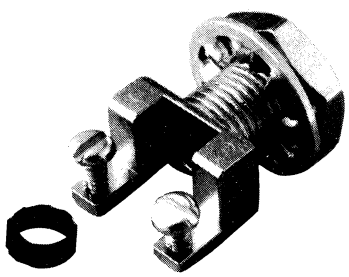
Material and Finish:

Ferrule and Polishing Bushing — Thermoplastic
Retainer Assembly — Copper alloy, nickel plated

Fiber Cladding Diameter (µm)	Kit Part Numbers
125	501067-2
140	501068-2

Notes: 1. These connectors are for cables with a 3.0-mm jacket diameter.
2. Kits include heat shrink tubing, metal retainer assembly, ferrule, polishing bushing, and protective cap.

Active Device Mount For Simplex Connectors



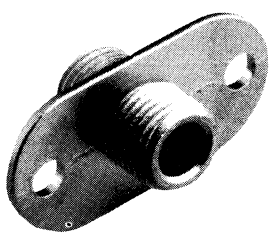
Can be used with TO-18, TO-46, TO-52, and Honeywell plastic Sweetspot active devices

Material and Finish:

Device Mount — Cast zinc, nickel plated
Nut — Brass, nickel plated
Lockwasher — Steel, zinc plated
Mounting Screws — Steel, zinc plated

Part Number 501184-1
Kit includes active device mount, device ring, lock washer, jam nut, protective cap, and mounting screws.

Panel Mount Coupling Bushing For Simplex Connectors



Material and Finish:

Cast zinc, tin plated

Part Number 501185-1

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AMP

Electro-Optic Connectors (OPTIMATE)

FSMA-I Connectors For Multimode Fibers

Industry compatible with 905-style connectors

Material and Finish:

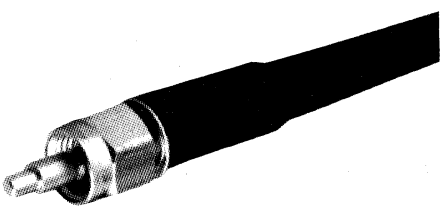
Connector Body Assembly — Brass, nickel plated
Coupling Nut — Stainless steel or aluminum
Connector Tip — Thermoplastic
Eyelet — Copper, tin plated
Heat Shrink Tubing — Polyolefin
Primary Ferrule — Thermoplastic

Fiber Cladding Diameter (μm)	Kit Part Numbers
125	501003-1
140	501003-2

Notes: 1. These connectors are for cables with a 3.0-mm jacket diameter and strength members.
2. Kits include connector body assembly, eyelet, primary ferrule, heat shrink tubing, protective cap, and spacer tube.

FSMA-II Connectors For Multimode Fiber

Industry compatible with 906-style connectors



Material and Finish:

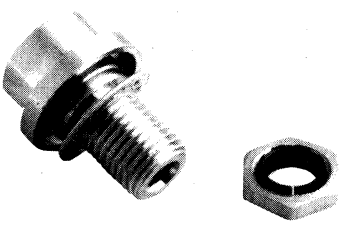
Connector Body Assembly — Stainless steel
Coupling Nut — Stainless steel or aluminum
Alignment Sleeve — Thermoplastic
Eyelet — Copper, tin plated
Heat Shrink Tubing — Polyolefin
Primary Ferrule — Thermoplastic

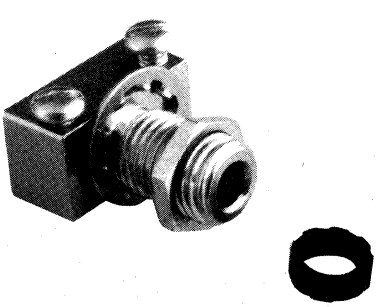
Fiber Cladding Diameter (μm)	Kit Part Numbers
125	501030-1
140	501030-2

Notes: 1. These connectors are for cables with a 3.0-mm jacket diameter and strength members.
2. Kits include connector body assembly, eyelet, primary ferrule, heat shrink tubing, half and full alignment sleeves, protective cap, and spacer tube.

Active Device Mounts For FSMA-I and II Connectors

Can be used with TO-18, TO-46, TO-52, and Honeywell plastic Sweetspot active devices





Material and Finish:

Device Mount — Brass, nickel plated
Device Ring — Thermoplastic
Lockwasher — Steel, zinc plated
Nut — Stainless steel

Part Number 501052-1 (Panel Mount Kit)
Kit includes active device mount, device ring, lock washer, jam nut, and protective cap.

Part Number 501055-1 (PCB/Panel Mount Kit)
Kit includes active device mount, device ring, lock washer, jam nut, protective cap, and two 2-56 mounting screws.

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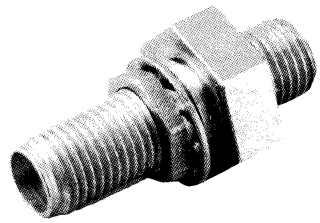
Coupling Bushing
For FSMA-I and II Connectors

Material and Finish:
Device Mount — Brass, nickel plated
Device Ring — Thermoplastic
Lockwasher — Steel, zinc plated
Nut — Stainless steel
Mounting Screws — Steel, zinc plated

Part Number 501049-1 (Unsealed)
Kit includes coupling bushing, lock washer, jam nut, and protective cap.



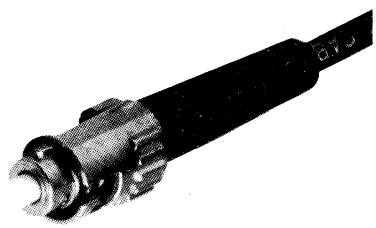
2.5 mm Bayonet Connector
For Multimode Fiber

Compatible with AT&T ST connectors

Material and Finish:
Connector Body and Coupling Nut — Zinc, nickel plated
Capillary — Ceramic
Crimp Eyelet — Copper, tin plated
Strain Relief Boot — Thermoplastic elastomer

Fiber Cladding Diameter (µm)	Kit Part Numbers
125	501380-1
140	501380-2

Note: Kits include connector, crimp eyelet, strain relief, dust cover, and 3-mm OD PVC sleeve for 2.4-mm applications.

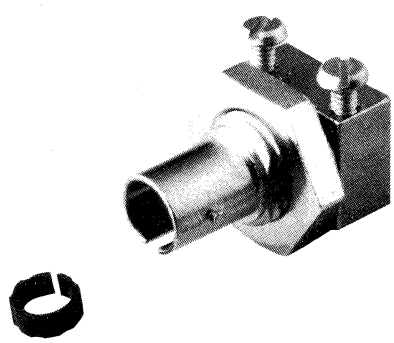


Active Device Mount
For 2.5 mm Bayonet Connectors

Can be used with TO-52, TO-18, TO-46, and Honeywell Sweetspot active devices

Material and Finish:
Body — Zinc, die cast, nickel plated
Nut — Brass, nickel plated
Lockwasher — Stainless steel
Device Ring — Polyester
Screws — Stainless steel
Protective Caps — Vinyl

Part Number 501474-1
Kit includes device mount, lock washer, jam nut, and two protective caps.



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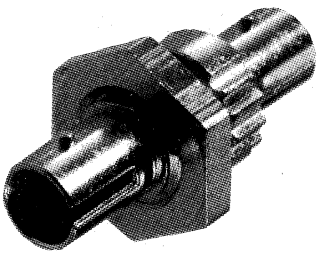
AMP

Electro-Optic Connectors (OPTIMATE)

Coupling Receptacle For 2.5 mm Bayonet Connectors

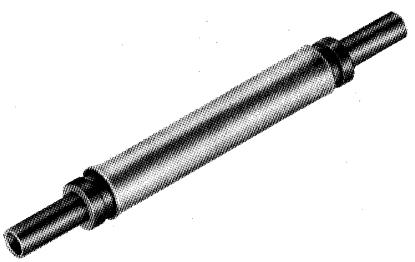


Material and Finish:

Coupling Receptacle Body — Zinc, nickel plated
Receptacle Alignment Sleeve and Retainer — Thermoplastic
Spring and Lock Washer — Stainless steel
Jam Nut — Brass, nickel plated
Protective Caps — Vinyl

Part Number 501381-1
Kit includes coupling receptacle, lock washer, jam nut, and two protective caps.

Mechanical Splice For Single-Mode Fiber



Terminates 125-µm single-mode buffered fiber to provide a low-loss (less than 0.2 dB) permanent splice

Material and Finish:

Sleeve — Copper, tin plated
Bushings — Brass

Part Number 501519-1

Continuity Checker

Sorts fibers, checks continuity and attenuation, and isolates faults

Connector Type	Kit Part Numbers
Simplex	501446-1
FSMA	501446-2
2.5 mm Bayonet	501446-3

Note: Complete kit includes one transmitter, one receiver, two ni-cad batteries, one charger, two fiber ferrules, carrying case, and operating instructions.

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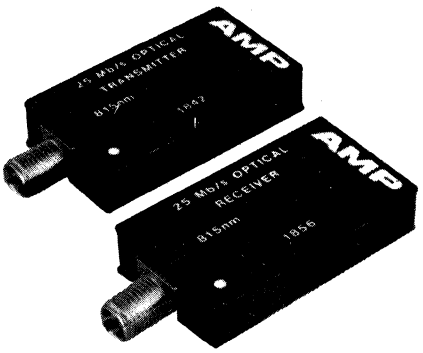
AMP

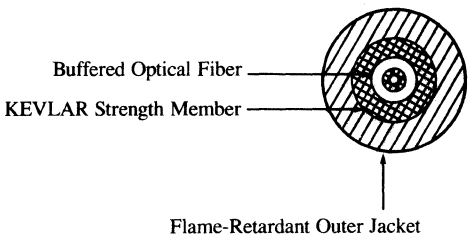
Data Links

Plating:
Pins — 0.00076 mm gold over 0.00127 mm nickel

Data Capabilities	Part Numbers			
	Interface Connector Type			
	FSMA		2.5 mm Bayonet	
	Transmitter	Receiver	Transmitter	Receiver
25 Mb/s TTL	501388-2	501389-2	501388-3	501389-3
50 Mb/s ECL	501376-2	501377-2	501376-3	501377-3
100 Mb/s ECL	501342-2	501343-2	501342-3	501343-3
125 Mb/s ECL	501690-2	501691-2	501690-3	501691-3



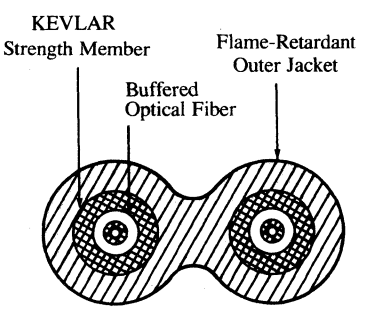
Multimode Light-Duty Single-Channel Cable



Multimode Light-Duty Dual-Channel Cable

Fiber Optic Cable
Light-Duty Multimode Cable

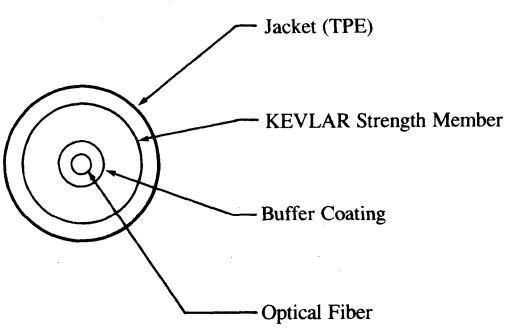
Channels	Core Diameter (µm)	Cladding Diameter (µm)	Attenuation 850/1300 nm Maximum (dB/km)	Bandwidth 850/1300 nm Minimum (MHz-km)	Part Numbers (Bulk Length)
Single	50	125	4.0/2.5	400/400	501110-5
	62.5	125	4.5/2.5	160/500	501318-1
	100	140	5.0/4.0	100/200	501112-5
Dual	50	125	4.0/2.5	400/400	501113-5
	62.5	125	4.0/2.5	400/400	501319-1
	100	140	5.0/4.0	100/200	501115-5



Single-Mode Single-Fiber Cable

Single-Mode Fiber Optic Cable

Specifications:
Number of Fibers — 1
Cable Outer Diameter (Nominal) — 3.0 mm
Attenuation (Maximum at 1300 nm) — 1.0 dB/km
Part Number 501413-1 (Bulk Length)



Need product information or how to contact your authorized AMP distributor—call 1-800-522-6752

AMP Incorporated, Harrisburg, PA 17105

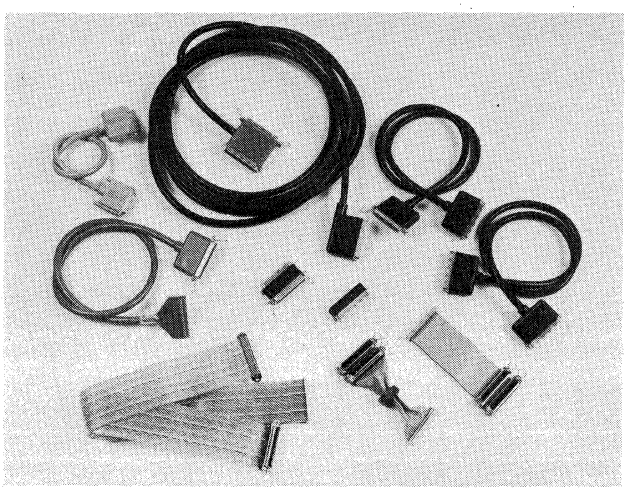
AMP

Amphenol

an LPL Company

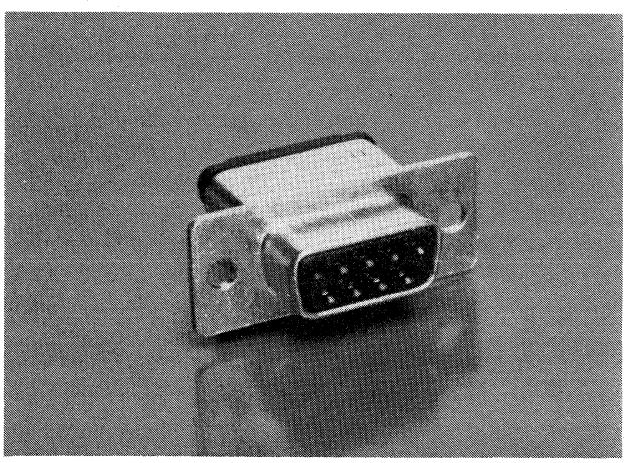
358 Hall Ave., Wallingford, CT 06492 • (203) 265-8900 • FAX-203-265-8793

Amphenol, a well known name in the connector industry for over 50 years, is focused to meet the ever changing needs of the world of electronics. Our streamlined manufacturing operations along with an aggressive and experienced management team are committed to recognizing and...



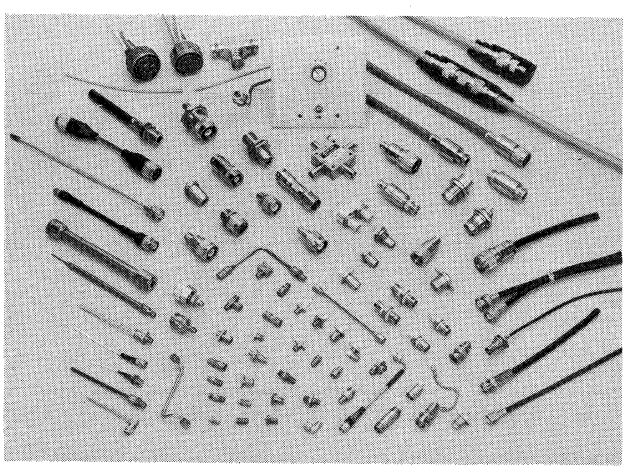
Amphenol Interconnect Products

Amphenol Interconnect Products has manufacturing facilities located in Endicott, NY and Colorado Springs, CO with 145,000 sq. feet of space and 600 employees. We design, tool and manufacture custom and standard computer interface cables, military cable assemblies, fiber optic and flat ribbon cable assemblies, and telephone interconnection products. Our product capabilities include: overmolding, specialized connector and cable design, die cast backshell design and customized hardware, end product packaging, as well as just-in-time and ship to stock delivery, all enhanced with Amphenol Corporation's worldwide sales and manufacturing.



Amphenol Canada

Amphenol Canada has been manufacturing filter connectors for over 25 years. Amphenol has demonstrated industry leadership in the design of filter connectors. Twenty years ago we were the first to use removeable stress-isolated filter contacts in our mil/sero class of connectors. We were also the first to introduce monolithic planar filters. Most recently, we were the first again to extend filter technology through the use of chip capacitors in our connectors. This patented design allowed us to meet the needs of the commercial filter market providing our customers with the lowest cost per line filter connector along with high performance and reliability. Several million connectors utilizing this chip capacitor technology are currently in use by the major computer and telecommunications equipment manufacturers.



RF Microwave Operations

Employing some 600 persons in 225,000 sq. feet of facilities, RFO serves the coaxial interconnection needs of nearly 170,000 customers. With annual shipments of 30 million connectors and cable assemblies, Amphenol RF/Microwave products are marketed directly to original equipment manufacturers through 60 sales outlets in the U.S., Canada, and eleven other countries, as well as through an international network of more than 1,000 distributors. Amphenol RF/Microwave products include:

- Standard connector series: UHF, N, HN, C, SC, Twinax, Triax, TRB
- Miniature connector series: BNC, TNC, MHV, TPS, DM, Mini-UHF
- Sub-miniature connector series: SMA, SMB, SMC, SSMA, A-50, Coax Contacts
- Precision connector series: APC-2.4, APC-3.5, APC-7, APC-7S, APC-N
- RF/Microwave and precision between series adapters
- Automatic coaxial terminators

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Amphenol

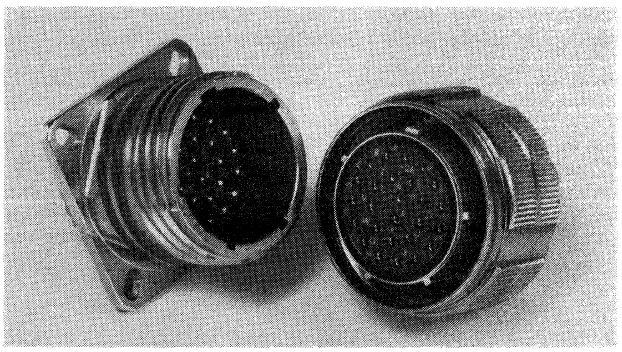
...meeting our customers needs, and maintaining our leadership position in a dynamic connector industry. Our successful history and vast selection of interconnection products helps us to meet the industry's challenge to become the best.

Bendix Connector Operations

Amphenol Corporation, Bendix Connector Operations, is located in Sidney, New York. This 675,000 square foot complex incorporates the latest in design, development and manufacturing technologies, and employs over 2200 people from Sidney and surrounding communities.

We are a vertically integrated operation from initial connector design to component manufacturing, assembly, test and shipping of the finished product.

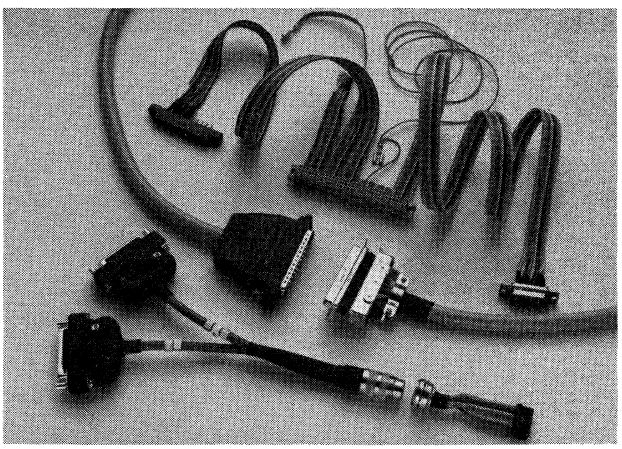
The Amphenol®/Bendix® product line is composed of the most complete line of MIL Qualified cylindrical connectors offered by any connector manufacturer. This line includes MIL-C-38999 Series I, II, and III, 27599, 26482 Series I and II, 81511 Series I and II, 22992 and 5015. In addition we offer the popular 97 Series commercial connectors, MIL-C-55302 Low Mating Force PC B connectors, LRM Surface Mount, Composites, Fiber Optics, Transient Suppression and Fail Safe Breakaway plus numerous specials.



Industrial Technology Division

The Industrial Technology Division of the Amphenol Corporation is a leading supplier of Electronic connectors and connector-related products. The company is known particularly for its input/output (I/O) connectors, which include a variety of rectangular connectors, telephone connectorized devices and industrial power niche products.

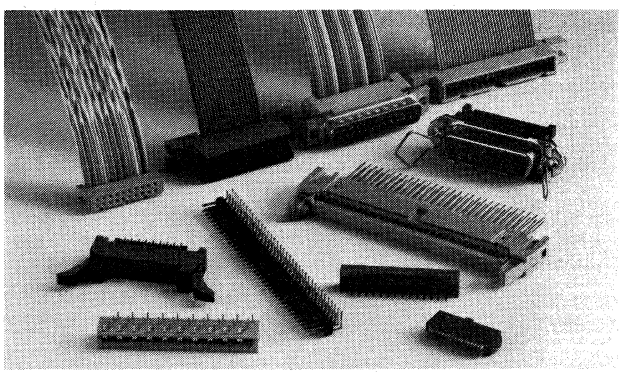
- Rectangular Connectors. Square or rectangular in shape, these connectors are typically input/output connectors and are used primarily by computer, telecommunications and industrial equipment manufacturers. Industrial Technology Operations is a major supplier of D-subminiature connectors and other rack and panel type connectors.
- Industrial Connectors. Circular or rectangular niche versions are used in the marine, machine tool and industrial machine industries for power applications.



Spectra-Strip

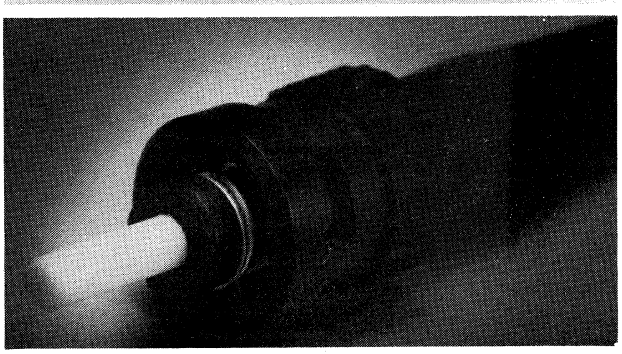
The Spectra-Strip Division, located in Hamden, Connecticut, markets a broad line of mass termination IDC cable and connectors. Spectra-Strip offers complete cable and connector design flexibility from the same location. Intensive quality control programs, and reliability of on time deliveries guarantee you get quality products, when you need them.

Spectra-Strip Cable products include standard flat ribbon cable, ribbon coax, high flex life, twisted pair, twist 'n' flat, flat conductor, round 'n' flat and .025″ pitch cable. Amphenol connector products marketed at Spectra-Strip include DIN, D-subminiature, micro ribbon, high and low profile sockets and headers, card edge, two piece board mount, 025″ pitch, and high density connectors.



Fiber Optic Products

The 953 Series Multimode connectors are precision ST-compatible interfaces manufactured to demanding international performance specifications. These systems incorporate a new connector, a new adapter, and a new method for rapid field terminations. The 953 is constructed of a glass reinforced polymeric body and coupling nut, ceramic ferrule, copper crimp ferrule and PVC bend relief boot allowing the connector to achieve improved insertion loss, durability and environmental insensitivity at the lowest possible cost. The system is based on, and completely compatible with AT&T's recently introduced ST connector. The 953, however, combines the precision of complete ceramic alignment with the economy and durability of a polymer housing to yield improved performance over other ST functional equivalents for both single mode and multimode applications. The termination procedure is considerably more rapid than others available and incorporates special fiber cleaving and polished tools which allow any non-skilled person to obtain low loss interconnects–reliably and very quickly.



Amphenol

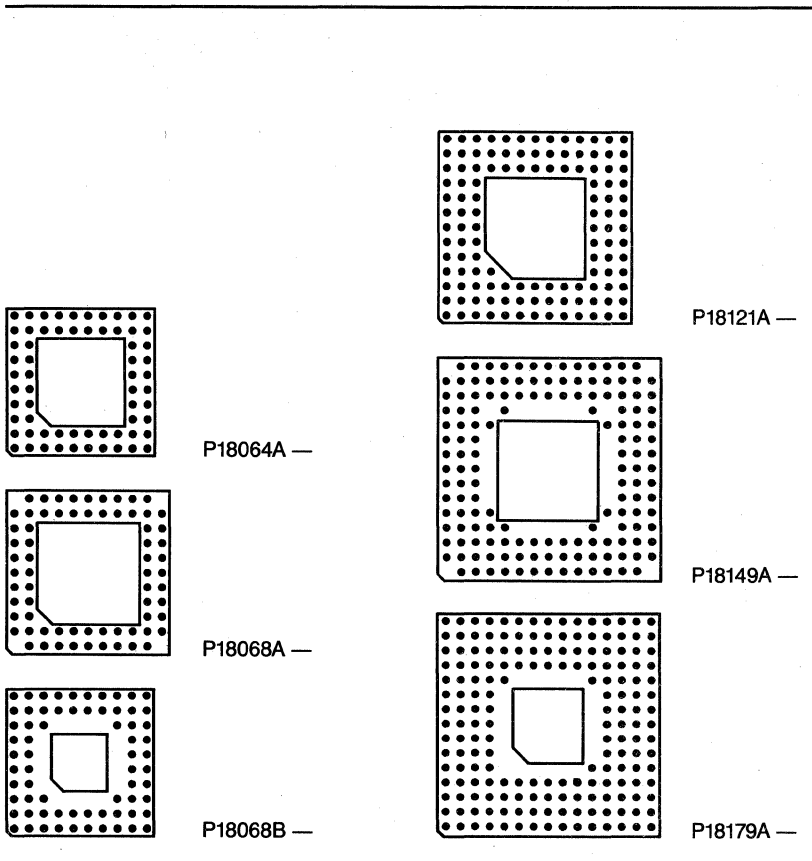
ANDON

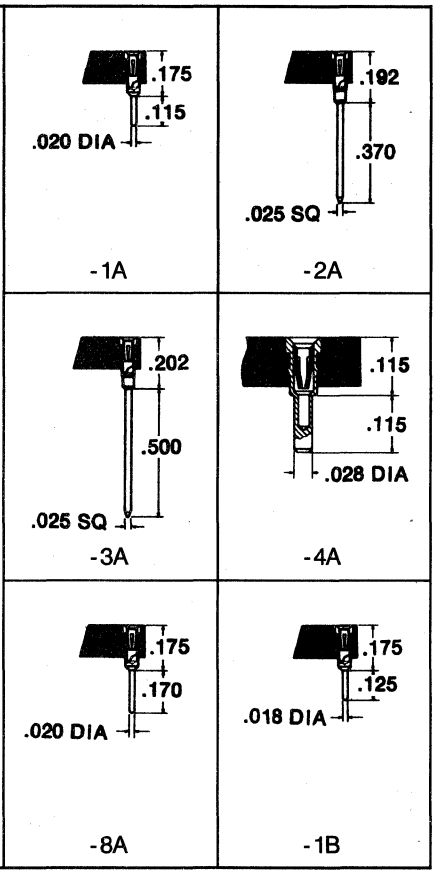
Pin Grid-Array Sockets

Low Insertion-Force Contacts

P 18 068 A — 1A — 445 D

P	18	068	A	—	1A	—	445	D
INSULATOR MATERIAL	SERIES	NO. OF PINS	FOOTPRINT		TERM STYLE		PLATING	INSULATOR THICKNESS





New

- ANTACT™ CONTACT for Adjustable Normal Force

Advantages

- Low Force Contact; Allows Easy Loading of Device:
  — Insertion: 1.5 oz. Max.
  — Withdrawal: 0.5 oz. Min.
- Available in Standard and Custom Patterns on Grids from 7 × 7 to 30 × 30.
- Contact Pressure can be Adjusted to Suit Your Requirements.
- Consult Factory for "Pull-Off"™ Carrier Sockets for "Ionic Contamination Tree" High Speed Requirements.
- Short Stamped and Formed BeCu Contact for High Reliability.

Plating

-445; Gold Contact, Tin Sleeve
-446; Gold Contact, Gold Sleeve

Insulator Material

P; Glass Filled Polyester to 94-VO
G; Glass Epoxy Laminate

Consult Factory for Over 1000 Standard and Custom Sockets

AEC

Andon Electronics Corporation

4 Court Drive, Lincoln, RI 02865, USA
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TEL. (401) 333-0388

ANDON

Design and Engineering Assistance for Interconnect Components

IC Sockets • PGA Sockets • Molded Stand Off Terminals • Molded Feed Through Terminals and Test Jacks

Andon Electronics Corporation was established to provide the industry with in-depth technical assistance and interconnect components.

Multi-million dollar systems are dependent upon the sum total of all "nickel and dime" interconnects. This presents a challenge for the component manufacturer. At the present time there is a tendency to "copy-cat" rather than improve the state-of-the-art to keep up with the industry.

The personnel at Andon have a proven track record with up to 30 years experience in the aerospace, military, medical, industrial and commercial computer industries.

Our committment to you is to *listen* to your problem, formulate a *design* to fill your requirements and *produce* a product improvement at a cost reduction.

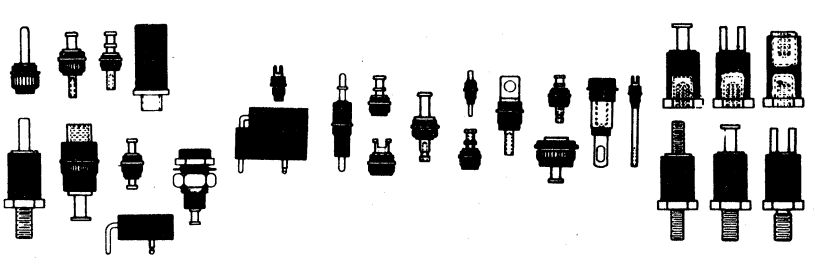
We welcome the opportunity to show you that we are technical problem solvers. Our modern plant is ready to be of service to you.

John O. Tate
President

Terminals and Test Jacks
Spline-Loc® Terminals

- Terminals contain knurls which allow material displacement without tearing the board. The Spline-Loc® prevent terminals from spinning and pushing out.
- Andon's Test Jacks are made to rigid specifications for military and commercial use. Andon also features a wide variety of threaded, molded standoffs and feed-thru terminals.

Meets MIL-T-55155 & MIL-C-39024



Send for Detailed Catalog

AEC

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ANDON Low Profile Dip Sockets

Ordering Information

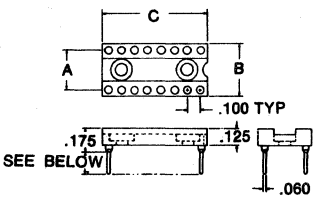
10 3 06 — 01 — 445

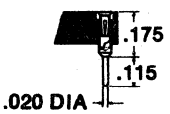
SERIES NUMBER	DIP SPACING	NO. OF PINS	TERM STYLE	PLATING
10	3	06	01	445

# OF PINS	DIP SPACING A DIM."	WIDTH B DIM."	LENGTH C ODM."
06	.300	.400	.300
08	.300	.400	.400
10	.300	.400	.500
14	.300	.400	.700
16	.300	.400	.800
16	.400	.500	.800
18	.300	.400	.900
20	.300	.400	1.000
22	.400	.500	1.100
*24	.300	.400	1.200
24	.400	.500	1.200
24	.600	.700	1.200
28	.600	.700	1.400
32	.600	.700	1.600
36	.600	.700	1.800
*48	.600	.700	2.400
*50	.900	1.000	2.500
*52	.900	1.000	2.600
*64	.900	1.000	3.200

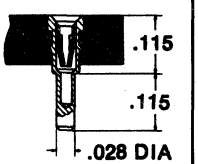
* Available only in open frame.

10000 Series — Closed Frame Socket



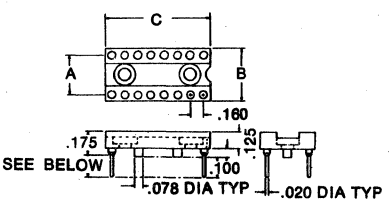


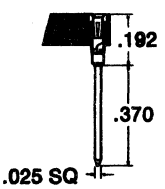
-01



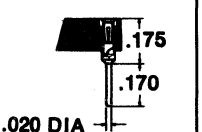
-47

11000 Series — Frame With Standoffs



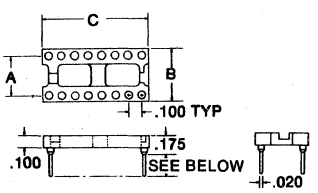


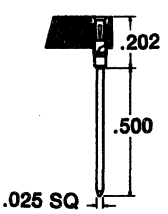
-02



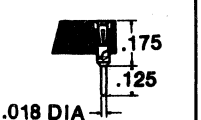
-08

1700 Series — Open Frame Sockets





-03



-94

Terminal Styles (Brass)

-01	PC Mount	.115" Tail	.020" Dia. Pin
-02	2 Level W/W	.375" Tail	.025" Sq. Pin
-03	3 Level W/W	.500" Tail	.025" Sq. Pin
-08	PC Mount	.170" Tail	.020" Dia. Pin
-09	PC Mount	.280" Tail	.020" Dia. Pin
-11	PC Mount	.135" Tail	.020" Dia. Pin
-47	PC Mount	.115" Tail	.028" Dia. Pin

Plating

-445; Gold Contact, Tin Sleeve
-446; Gold Contact, Gold Sleeve

Material

Glass-Filled Polyester to 94-VO
Operating Temp.: – 65°C - + 175°C
Low Insertion Force: 24-64 Pins

Advantages

- Short 4 Finger Clip for High Reliability
- Will Accept Leads .012/.022" in Dia.
- End to End and Side to Side Stackable
- Closed-End Terminal Eliminates Solder Flowing into Contact Area

Consult Factory for Over 1000 Standard and Custom Sockets

AEC

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EEM MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination.* This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float.* Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof.* May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card.* The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

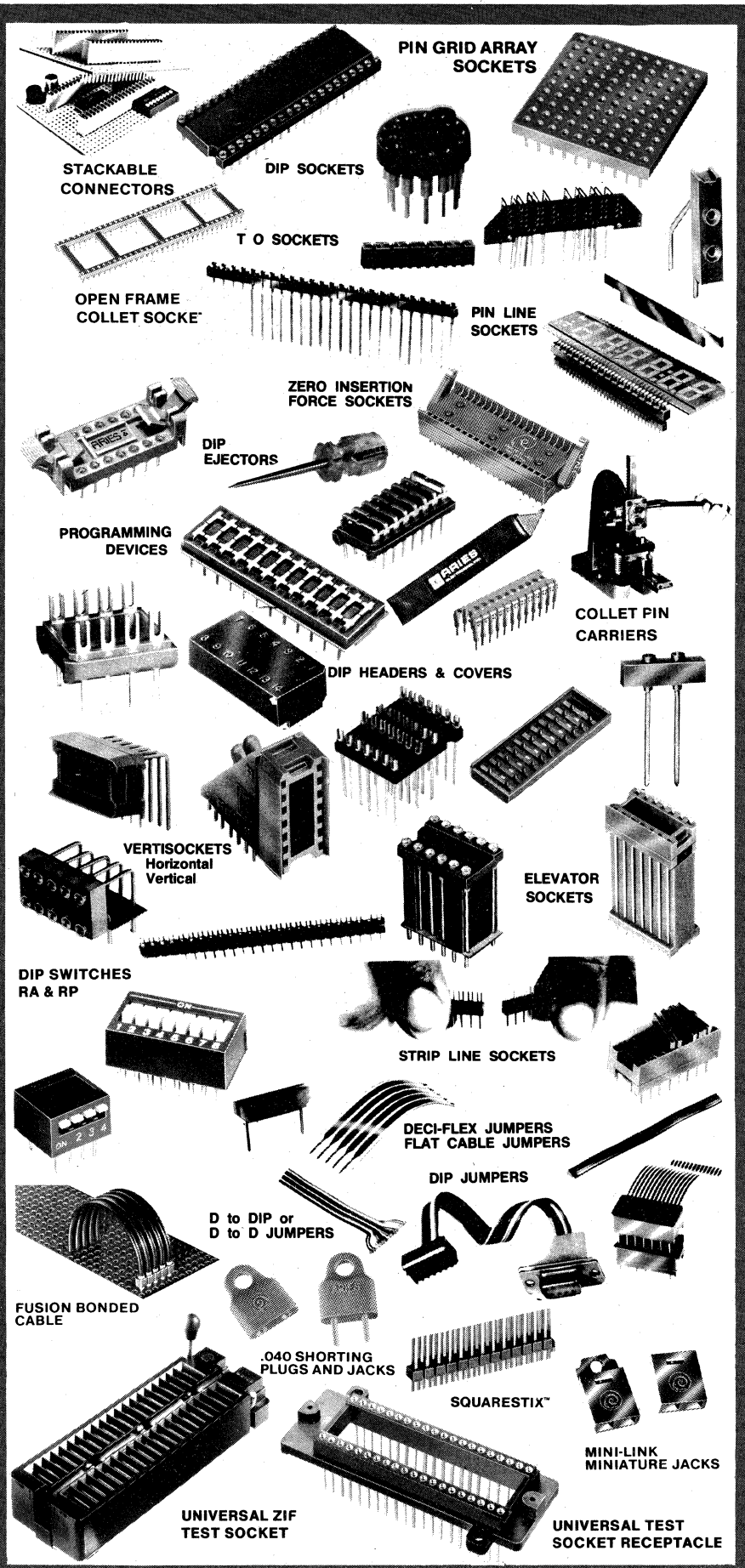
Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement.*

Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage.* Can be confused with the term used to describe how many times a connector may be mated and separated.

Withstanding voltage: Also called *test voltage.* The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.



ARIES®
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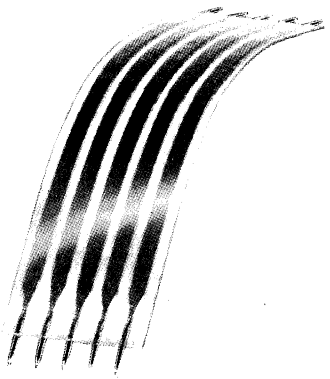
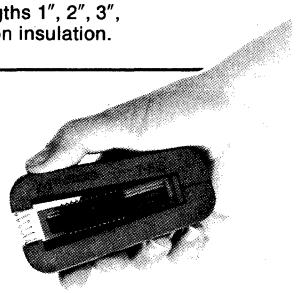
Complete information in Catalog-289

The Industry's most complete line of DIP products

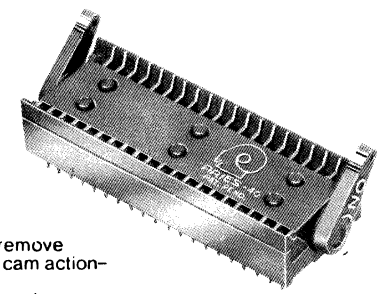
DIP SOCKETS—6 STYLES



DECI-FLEX®
(SERIES 160)
Low cost, flexible multi-conductor interconnection. Available any number of conductors on .100 centers. Lengths 1", 2", 3", with polyester, nomex or teflon insulation.

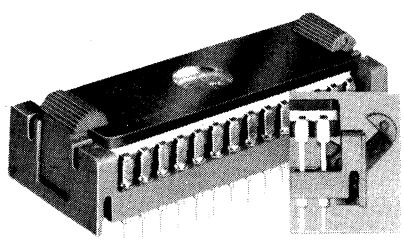


NEW! ANTI-STATIC
T516AS
DIP-R-SIZER
HAND TOOL
Molded of anti-static material...ideal for MOS devices susceptible to static damage.

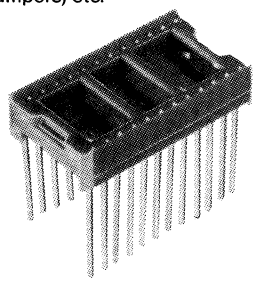


ZERO INSERTION
FORCE SOCKET
(SERIES 516)
Normally Open—
No force to insert component.
Closed—Holds component firmly.
Open—No force to remove component. Smooth cam action—no tools required.
Available 24, 28, 40 and 64 contacts.

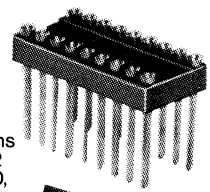
Collet EJECT-A-DIP Sockets
Rugged, solderable DIP socket with unique latch to lock-in jumpers, ICs, etc. Latch also ejects DIP packages without damage to pins. Ideal for high vibration environments or applications in which device leads get bent during removal. High reliability collet contacts accept round or rectangular pins. Available solder tail or wire wrap in 14, 16, 24, 28 and 40 pin sizes. Locking latch heights available for many manufacturers' connectors. Consult factory for specials.



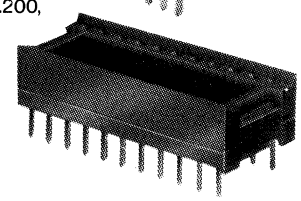
DIP SOCKETS
For mounting IC's, logic jumpers (see DIP-R-LOGIC Jumpers) etc.



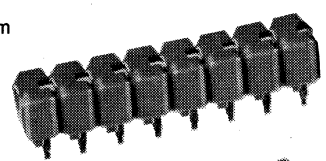
SERIES 501
Wire Wrap* Type Pins with Aries bifurcated contacts. Available: 8-10-14-16-18-20-22-24-28-32-34-36-38-40-48 Pins on .200, .300, .400 and .600 centers.



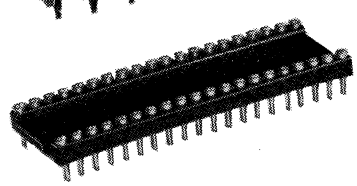
SERIES 503
LO-PRO®file Sockets—Wire wrap pins with collet style contacts. Available 2 to 64 pins in increments of 2 on .200, .300, .400, .600 or .900 centers.



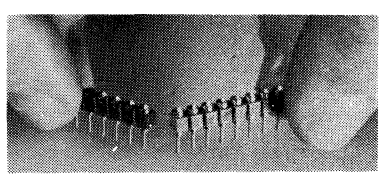
SERIES 511
Solder Type Pins with Aries bifurcated contacts. Available: 8-10-14-16-18-20-22-24-28-32-36-40 Pins on .200, .300, .400 and .600 centers.



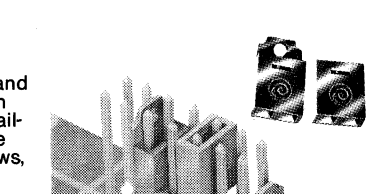
SERIES 0520 and 0525
Single row in-line sockets with "Breakable" feature. Uses stamped single beam face-grip contacts. 40 solder tail pins to a strip. Body breaks off cleanly to any desired number of contacts. Series 0525 mates with .025 square pins.



SERIES 513 and 518
Lo-PRO™ file Collet Style Sockets. Available 6 to 64 pins on .200, .300, .400, .600 and .900 centers. Series 518 is open frame.



STRIP LINE SOCKETS
SERIES 0513, 0503
with "break" feature for any desired number of positions (1 to 25 pins). Available solder tail, 2 and 3 wrap pins.



MINI-LINK™ and
SQUARESTIX™
Miniature jacks and a complete line of single and dual row .025 square pin products. Squarestix available up to 40 pins single row and 80 pins dual rows, both straight and right angle.

*TM—Gardner-Denver

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Frenchtown, NJ 08825
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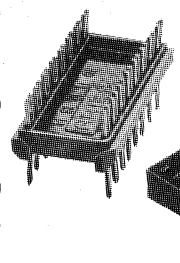
ARIES®
ELECTRONICS, INC.

Complete information in Catalog-289

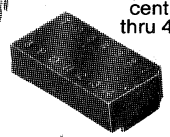
The Industry's most complete line of DIP products

DIP HEADERS and COVERS – 5 STYLES and SPECIALS



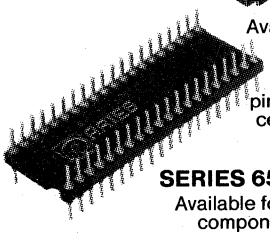
DIP HEADERS & COVERS for mounting components.

SERIES 600 with coined contacts. 2 Styles of Terminals: Post and Fork. Available 2 thru 20 pins on .300 centers; 22 pins on .400 centers; 24 thru 40 pins on .600 centers. Contact styles shown below.



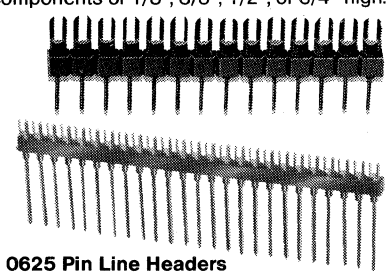
SERIES 625 with screw machine terminals. 5 Styles of Terminals. Available 2 to 40 pins—.200, .300, .400 and .600 centers.

SERIES 8625 with screw machine terminals. Available in 14-16-18-32 pins in single and double rows on .800 centers. Terminal styles shown below.



SERIES 650 COVERS: FOR HEADERS

Available for 8-14-16-24-40 pin sizes to accept components of 1/8", 3/8", 1/2", or 3/4" high.



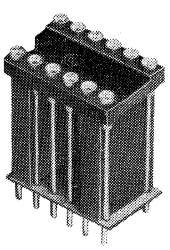
"BREAK" to length desired.

SERIES 0600 and 0625 Pin Line Headers

A single header strip both end and side stackable on .100 centers. (0600 with coined contacts). (0625 with screw machine terminals). Available: 1 to 25 pins on .100 centers.

ELEVATOR SOCKETS

Useful to bring device to level required. Available from 1/4" to 1-1/4" high. Standard heights in stock; specials 3 weeks.

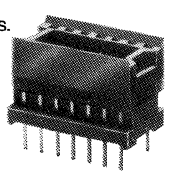


SERIES 8XXX (XXX=height)

Available 14 or 16 pin. Aries bifurcated pins on .300 centers.

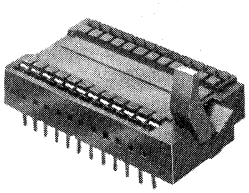
COLLET STYLE CONTACTS

2 to 64 pin. Any height 1/4" to 1-1/4"



SERIES 526 LO-PRO® ZIF SOCKET

A complete line of sizes, 24, 28, 40 and 48 pin, low profile ZIF (zero insertion force) sockets provides a low cost solution for a test socket with a height of only .319 and even with handle in open position, measures just .554. • Cam operation with socket normally in open position. • Cam is lightweight, strong and rigid cast metal for uniform action over entire contact area. • When closed the dual contact pin provides the excellent electrical characteristics of a gas tight seal. • Test point openings provided to reach all pins. • Dual contact pin is spring temper beryllium copper, tin plated. Other plating available. • Body is precision molded UL94VO rated plastic.

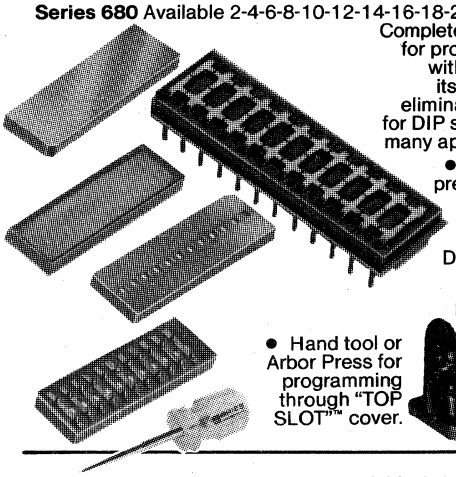


DIP PROGRAM HEADERS and COVERS

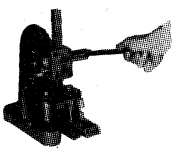
TOP-SLOT Programmable Headers and Covers

Series 680 Available 2-4-6-8-10-12-14-16-18-20-24 pins. Complete versatility for programming within header itself . . . thus eliminating need for DIP switches in many applications.

• Available pre-programmed from Aries Stocking Distributors.

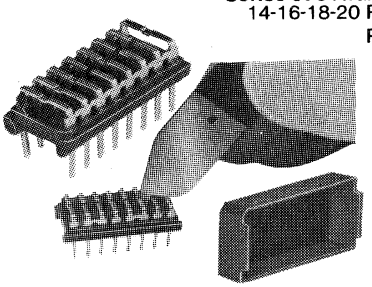


• Hand tool or Arbor Press for programming through "TOP SLOT"™ cover.



Series 675 Available 2-4-6-8-10-12-14-16-18-20 Pins on .300 centers

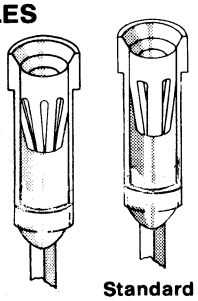
Program the header! Available pre-programmed or can be programmed by customer with needle-nose pliers or Aries Program Header Tool.



ARIES PIN CONTACT STYLES

ARIES COLLET CONTACT PINS

These high quality, high performance-to-cost ratio contacts use gold plated beryllium copper contacts within a brass socket body available either tin or gold plated. Collet contacts accept .015-.022 dia. round leads.

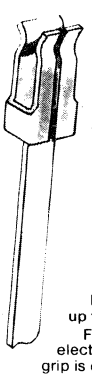


Standard

Low Insertion

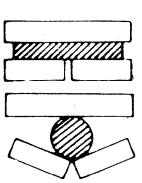
ARIES SINGLE BEAM FACE-GRIP CONTACT

Excellent electrical performance for a competitively priced production socket. Spring design and copper alloy (688) material assure long life performance of contacts.



ARIES BIFURCATED CONTACT PIN

Aries bifurcated contacts produce superior electrical contact characteristics, as well as firm physical spring grip. A secure mating is assured.



For flat leads up to .020 thick. For maximum electrical contact, grip is on thickness.

Redundant 3 point round leads up to .020 dia. contact for

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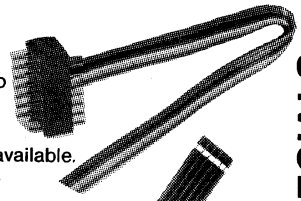
Frenchtown, NJ 08825
Telephone (201) 996-6841
Telex 6974615
FAX 201-996-3891

ARIES® ELECTRONICS, INC.

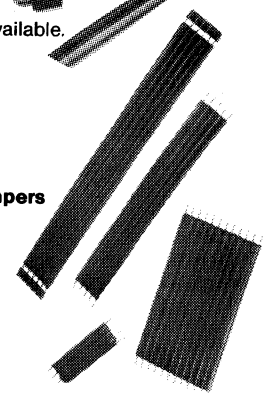
The Industry's most complete line of DIP products

DIP JUMPERS – 10 STANDARD STYLES and SPECIALS



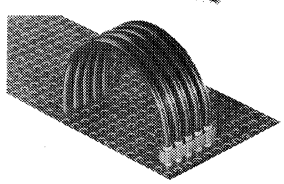
DIP JUMPERS
SERIES 100—DIP board to DIP board.
Available 4 thru 40 pins.
Any length cable.
Any connector orientation available.
12 standard configurations.

Also available with twisted pair cable or flat conductor cable.



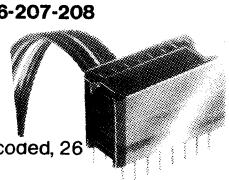
SERIES 152FB
Fusion Bonded Cable Jumpers

Available in 1" to 12" lengths in ¼" increments.
Conductors: 4 thru 12 on .100" centers.
Flexible, extruded PVC insulation on 26 gauge stranded wire conductors which are fusion bonded with an over-coat of tin for easy solderability and/or pluggability.
Fusion Bonded Cable Jumpers can be soldered directly to p.c. board or pluggable into Aries pin line sockets (Series 0513) or low cost (Series 0520).



DIP-ER LOGIC SOCKET/JUMPER
SERIES 206-207-208

Dip-er Logic Socket Jumpers saves the space on the board for a plug in position and can be used to impose two devices into one position.
Plugs into standard 8-14-16-24 and 40 position logic panels.
Any length cable. Cable—EIA color coded, 26 AWG (7 strands 34 AWG).
Type B—600 V 105° C.



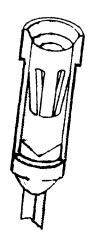
D TO DIP JUMPERS
SERIES 225

Cable assemblies using "D" Series subminiature connectors (9, 15, 25, 37 and 50 pin) on one end and Aries DIP Headers on other ends. Other end can be furnished stripped and tinned also. Cable is EIA color coded 26 AWG. Other sizes and types of cable can be accommodated.

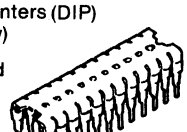
SPECIALS Aries will promptly respond to your special jumper requirements.

Series 540
COLLET PIN CARRIERS
DIP and Single Row

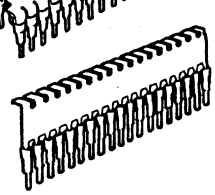
- 6 thru 24 pins on .300 centers
- 6 thru 48 pins on .600 centers (DIP)
- 2 thru 40 pins (single row)



Use Aries precision stamped collet pin insertion carriers and eliminate time consuming hand insertion of pins. Accurate alignment with the board hole pattern makes it fast and easy.



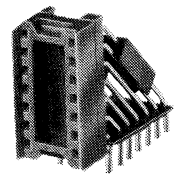
Collet sockets provide high reliability contacts to .015-.022 (.38 - .56) dia. leads or flat IC leads.



VERTISOCKETS 22 STYLES and SPECIALS

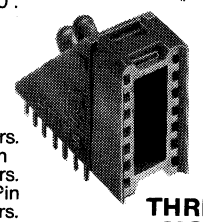
VERTISOCKETS®

For mounting LED Displays, Switches, Test Points. A complete line—from 2 pin for decimal to 40 pins for multiple displays.
Available for vertical, horizontal or edge card displays with optional mounting angles of 30°, 45°, 60° or 90°. Device mounting centers .200, .300 and .600.



VERTICAL MOUNTING

SERIES 2810— Available: 8-10 Pin (Aries bifurcated pins) on .200 centers.
SERIES 810—Available: 8-14-16 Pin (Aries bifurcated pins) on .300 centers.
SERIES 6810—Available: 8-10-14 Pin (Aries bifurcated pins) on .600 centers.

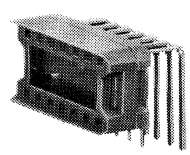


THRIFTY MODEL VERTISOCKET

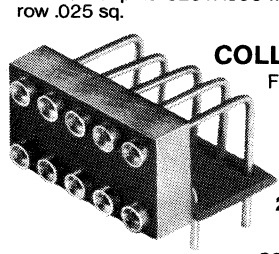
High volume—low cost—bifurcated contacts 14 Pin—.300 centers
Cat. No. 14-810-90R

HORIZONTAL MOUNTING

SERIES 2820, 2822 and 2823—Available: 8-10 Pins (Aries bifurcated pins) on .200 centers.
SERIES 820, 822, 823—Available: 8-14-16-18 Pins (Aries bifurcated pins) on .300 centers.
SERIES 6823—Available: 8 to 40 Pins (Aries bifurcated pins) on .600 centers.
SERIES 822E (Economy Model)—Available: 8-14-16-18 Pins. (Aries bifurcated pins) on .300 centers. Note: One row of pins .025 x .006 with other row .025 sq.



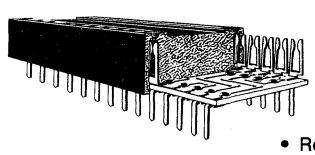
COLLET STYLE VERTISOCKET



For displays using round pins (Solder or Wire Wrap). Excellent for military applications. Can be provided with FR4 base material.

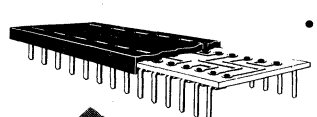
Horizontal
SERIES 2820C, 2822C, 2823C—Available: 8 and 10 pins on .200 centers.
SERIES 820C, 822C and 823C—Available: 8 to 20 pins on .300 centers in increments of two (2).

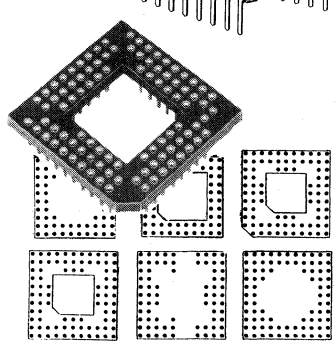
Vertical
8-10 pin on .200 centers
8-16 pin on .300 centers



CORRECT-A-CHIP
Standard or Special

- Reroute circuits with programmed sockets (saves pcb changes).
- Allows substitution of IC's (with different circuitry or pin count)





PIN GRID ARRAY SOCKETS

Collet contacts on .100 centers in a square matrix for acceptance of components not on conventional DIP matrix. Available to meet any configuration of pin positions. Special low insertion force collet contacts are used to reduce insertion force of high pin count devices. Many standard sizes available from 64 to 289 pins in either tail or wire wrap styles.

Ask for complete new PIN GRID Catalog PG487

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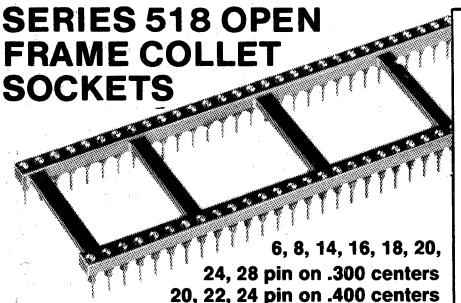
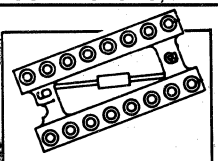
Telex 6974615
FAX 201-996-3891

Complete information in Catalog-289

SERIES 518 OPEN FRAME COLLET SOCKETS

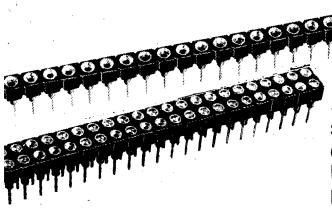


6, 8, 14, 16, 18, 20, 24, 28 pin on .300 centers
20, 22, 24 pin on .400 centers
24, 28, 32, 40, 48 pin on .600 centers
50, 64 pin on .900 centers



OPEN FRAME CAPACITOR SOCKETS

Capacitor sockets available with 1 mf or .33 mf capacitor welded to the solid contacts. Available for .300, .400 and .600 centers.



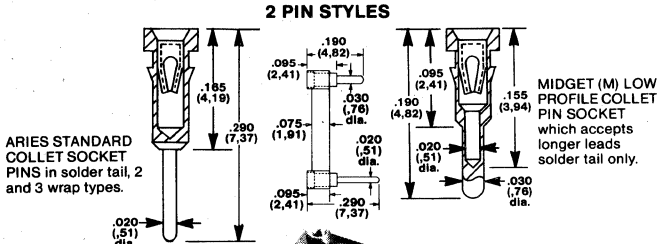
Series 0518

Single Row 2 to 40 pins (strip breakable to desired number)
Dual Row 2 to 80 pins
pins on .100 centers

FEATURES

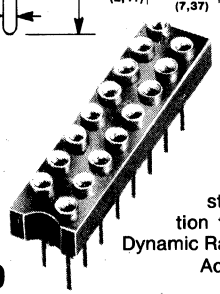
- Low cost, high production use sockets with Aries high reliability, screw-machined collet contacts. . . with four point contact redundancy and superior insertion-to-withdrawal ratios.
- Open frame allows more efficient utilization of board space.
- Open frame design for better cooling.
- Two pin styles: standard collet contact pins and new low profile midget pin to accept longer leads.
- Collet accepts .015-.022 diameter leads.
- Platform UL94V-O rated.

2 PIN STYLES



ARIES STANDARD COLLET SOCKET PINS in solder tail, 2 and 3 wrap types.

MIDGET (M) LOW PROFILE COLLET PIN SOCKET which accepts longer leads solder tail only.



ZIP SOCKET

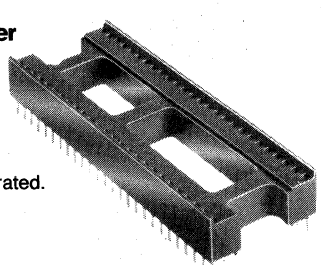
16, 20, 24 or 28 pin (staggered)

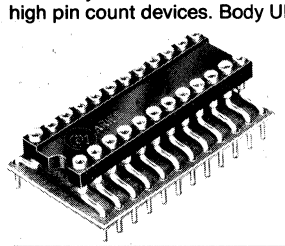
A .100 × .100 matrix in-line socket with collet pins staggered in zig-zag configuration to fit Mitsubishi, Fujitsu, etc., Dynamic Rams. There is also a ZIP DRAM Adaptor from zig-zag to standard .300 center p.c.b.

Series 570 .070 Pin to Pin Sockets for Shrink DIP Chips

40 and 52 pin rows on .600 center
64 pin rows on .750 center

Micro-processor Shrink-pack IC's with .070 pin spacing (TI) (Hitachi, Mitsubishi) have extremely low insertion force for these high pin count devices. Body UL94VO rated.



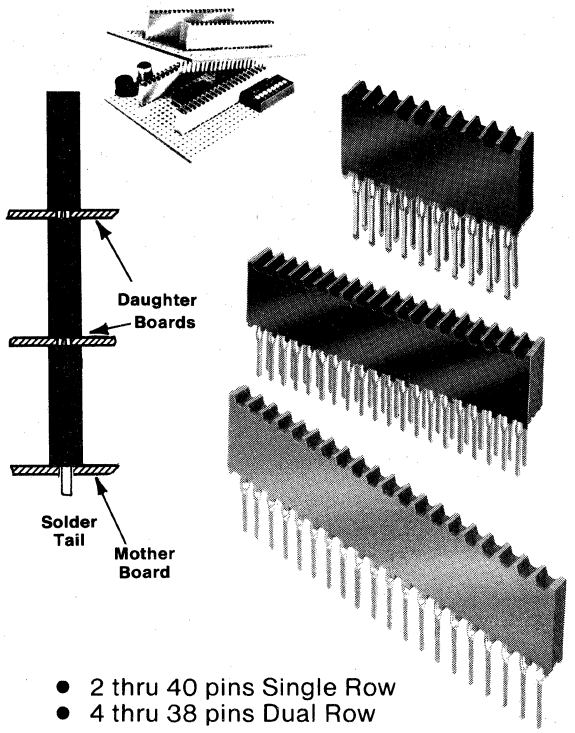


Adaptor Sockets

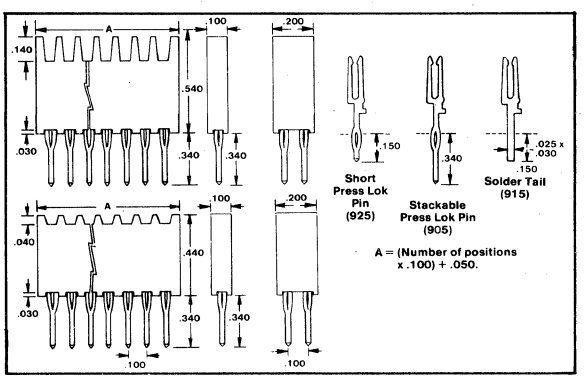
6 thru 40 pins .300 to .600
6 thru 48 pins .600 to .300

Allows use of .300 center devices when pcb is drilled for .600 or vice versa.

SERIES 900 PRESS-LOK™ STACKABLE CONNECTORS



- 2 thru 40 pins Single Row
- 4 thru 38 pins Dual Row



Hermaphroditic Stackable Connectors allow the stacking of 1/16 inch PCB's on .500 or .600 board centers. As many boards as desired may be stacked by soldering the solder tail version in the bottom mother board and then press fitting equivalent pin count units with the stackable style pin in the daughter boards. (Connectors with stackable pins can plug into each other or into the solder tail version in the mother board).

Connectors are available in standard 20 (single) and 40 pin (dual) row .100 x .100 grid. Other pin counts of 4 through 38 pin dual row or 2 through 19 pin single row are available as non-returnable specials.

These connectors are side-to-side stackable (for end-to-end stacking, skip one pin position). Phosphor bronze contact pins are available in tin, gold, or selective gold. The housing is glass filled thermoplastic with UL 94V-0 rating.

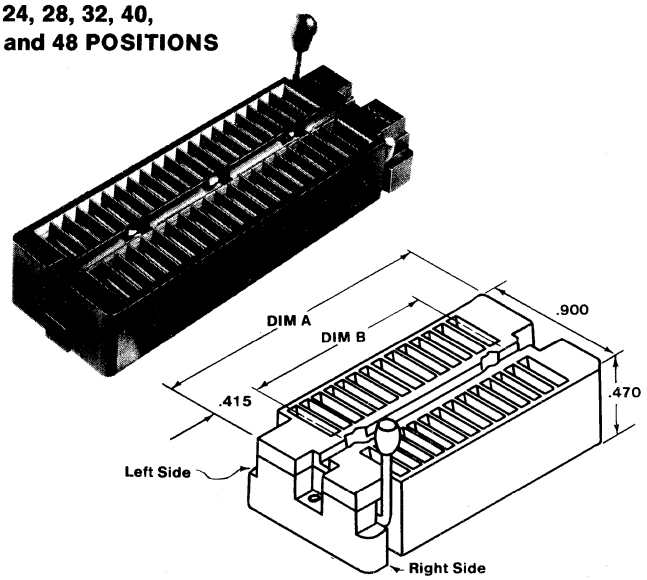
P.O. Box 130
Frenchtown, NJ 08825
Telephone (201) 996-6841
Telex 6974615
FAX 201-996-3891

ARIES® ELECTRONICS, INC.

Complete information in Catalog-289

UNIVERSAL ZIF TEST SOCKET and RECEPTACLE

24, 28, 32, 40, and 48 POSITIONS

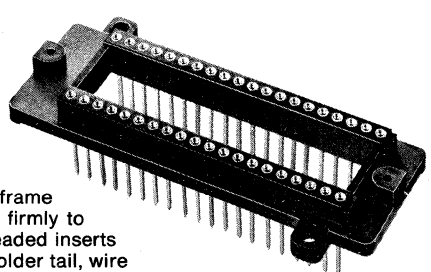


The new Aries Universal ZIF Socket is a direct replacement for other test sockets currently on the market, with a number of significant advantages:

- Priced 20% or more below competitive units!
- One socket accepts devices on either .300, .400 or .600 centers.
- All pin count sockets (24, 28, 32, 40, 48) go into p.c.b.'s with either .300 or .600 centers.
- Sockets can be soldered into p.c. boards or plugged into any socket. Socket fits into Aries or any competitive test socket receptacle.
- Contacts are normally closed to eliminate dependence on plastic to sustain contact.
- Accepts .015 to .045 wide leads.
- Contacts available tin plated (for up to 105°C) or gold plated (for up to 150°C) or nickel boron over CuNiSn spinodal alloy (for up to 200°C).
- Socket handle available UP or DOWN for closed position. Handle can also be reversed side-to-side (left or right hand).
- Available 24, 28, 32, 40, 48 pins in body of UL94VO rated polyphenylene sulfide.
- The unit is truly a Universal ZIF Socket. It accepts all pin counts from 6 thru 48 pins on .300, .400 or .600 centers!
- Insulation Resistance - 1000 megohms min.
- Dielectric withstanding voltage - 1000 VAC min.
- Contact rating - 1 amp.
- 25,000 - 50,000 cycles.

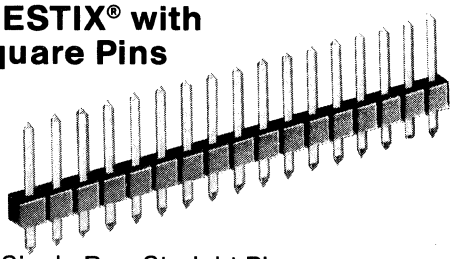
Test Socket Receptacle

24, 28,32, 40 and 48 positions



Sturdy, open frame socket mounts firmly to board and threaded inserts hold socket. Solder tail, wire wrap and solder cup pins available.

SQUARESTIX® with .025 Square Pins

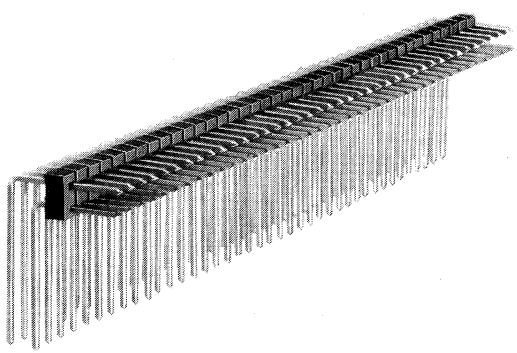


- 1 to 40 Single Row Straight Pins
- 2 to 80 Double Row Straight Pins
- 11 Pin Lengths
- Break-off to any length

Squarestix™ are straight .025 (.64) square pins in a single or double row body with 1 to 40 pins or 2 to 80 pins and available with 11 different pin lengths. The "break" feature allows full length strips to be broken to any number of pins without loss of any pins. They also can be ordered to any desired number of pins. Squarestix can be butted end-to-end or side-by-side on .100 (2.54) matrix. The body of Squarestix is UL94VO rated. To prevent solder wicking, Squarestix have .015 (.38) high standoffs.

SQUARESTIX™

.025 Single and Double Pin Rows on 90°



- 1 to 40 Single Row 90° Pins
- 2 to 80 Double Row 90° Pins
- 13 Pin Lengths (Single Row)
- 7 Pin Length (Double Row)

.025 (.64) square pins at a 90° angle in a single or double row plastic body, UL94VO rated, are available with 13 and 8 pin lengths respectively. A full single row contains 40 pins (single) to 80 pins (double). However, Squarestix can be ordered to any number of pins. The unique "break" feature allows breaking off any number of wanted pins. Single or double row 90° Squarestix are end-to-end buttable on .100 (2.54) matrix. Double row 90° pins are on .100 matrix vertically and horizontally. A .020 (.51) high standoff facilitates cleaning and prevents solder wicking.

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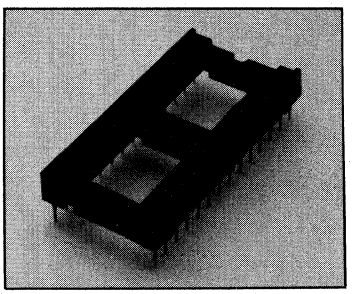
200C SERIES – STAMPED SINGLE BEAM CONTACT DIP SOCKETS

PART NUMBER (Ex: 216-AG 19DC)

2	X	X	-	A	G	X	X	D	C

- 200 SERIES
- CONTACT NUMBER: 8 – 48
- CONTACT MATERIAL AND PLATING:
  - 19 – Phos. Bronze Tin/Lead
  - 39 – BeCu Tin/Lead
  - *22,24 and 28 Pin .300 Centers
  - 10 – Phos. Bronze Tin/Lead
  - 30 – BeCu Tin/Lead
- TAIL LENGTH:
  - A – .100 – .110
  - D – .125 – .135
  - F – .145 – .155



Closed Bottom
UL Recognized

MATERIALS

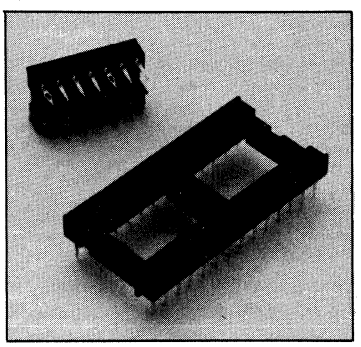
Insulator: Thermoplastic Polyester Rated 94V-0
Plating: 90/10 Tin/Lead (Per MIL-P-81728)
Contacts: Phosphor Bronze CDA 521 (Per QQ-B-750) Beryllium Copper CDA 170 (Per QQ-C-533)

400C SERIES – STAMPED DUAL BEAM CONTACT DIP SOCKETS

PART NUMBER (Ex: 416-AG218DC)

4	X	X	-	A	G	X	X	X	D	C

- 400 SERIES
- CONTACT NUMBER: 8 – 64
- "DAP" FEATURE (Plated thru hole)
  - 1 – .035" Dia.
  - 2 – .040" Dia.
  - Omit for standard PC Tail
  - "DAP" (Press Fit) Feature on Every Fourth Pin
- CONTACT MATERIAL AND PLATING:
  - 19 – Phos. Bronze Tin/Lead
  - 18 – Phos. Bronze Selective Gold 10µ"
  - 39 – BeCu Tin/Lead
  - 15 – BeCu Selective Gold 10µ"
  - 49 – BeCu Selective Gold 30µ"
  - *24 Contact .300" Centers
  - 10 – Phos. Bronze Tin/Lead
  - 38 – Phos. Bronze Selective Gold 10µ"
  - 30 – BeCu Tin/Lead
  - 35 – BeCu Selective Gold 10µ"
  - 32 – BeCu Selective Gold 30µ"
- TERMINATION: D – PC Tail



Closed Bottom
UL Recognized

MATERIALS

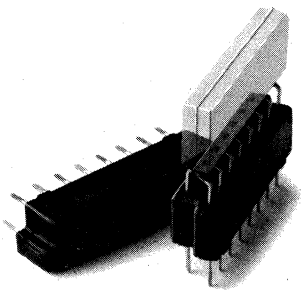
Insulator: Thermoplastic Polyester Rated 94V-0
Contacts: Phosphor Bronze CDA 521 (Per QQ-B-750) Beryllium Copper CDA 170 (Per QQ-C-533)
Plating: 90/10 Tin/Lead (Per MIL-P-81728) 10µ" Or 30µ" Selective Gold Over Nickel On Contact Surface (Per MIL-G-45204), 90/10 Tin/Lead on Solder Tail

ZIP SOCKETS

PART NUMBER

2	5	0	0	-	1	T	T	-	1	1	6

- ZIP SOCKET SERIES
- CONTACT MATERIAL: 1 – Phos. Bronze
- CONTACT PLATING: T – Tin-Lead (100" minimum)
- P.C. TAIL PLATING: T – Tin-Lead (100" minimum)
- ROW SPACING: 1 – .100
- NUMBER OF POSITIONS: 16,20,24



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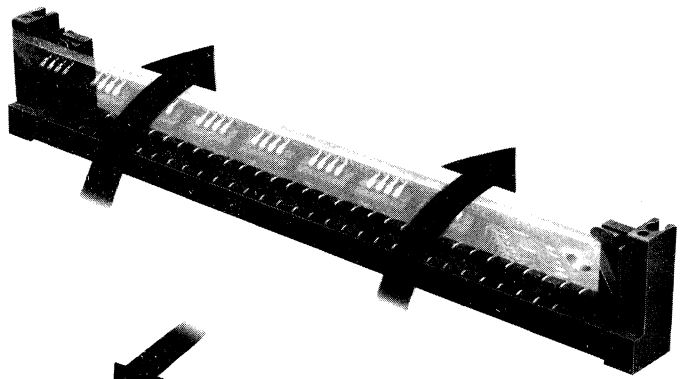
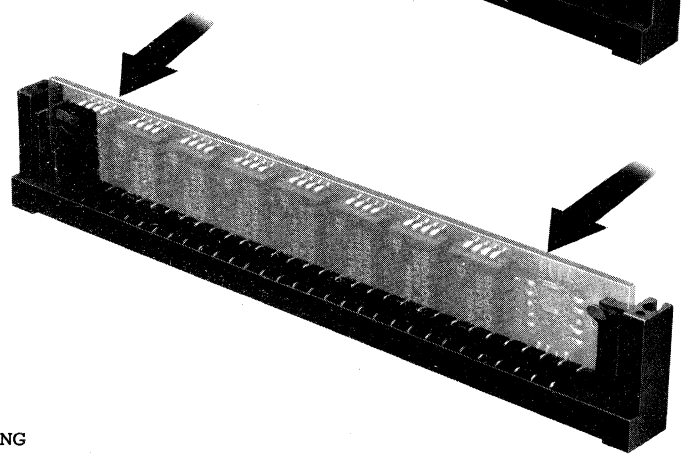
2900 SERIES
SIMM® SOCKET

INSERTION
Place SIMM module into socket as shown above, push module in direction of arrows until plastic "shoe horns" penetrate thru holes in module. Now that the module is on plastic "shoe horn," press down on module to secure in place.

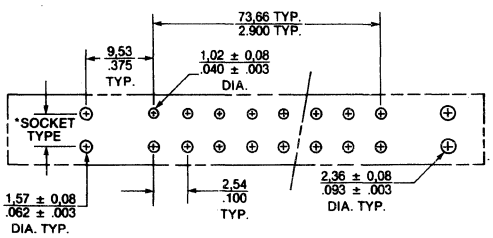


REMOVAL
Place fingers behind module at "shoe horn" locations and pull module forward as indicated by arrows above. This will lift the module out of socket thereby making removal of module from socket a cinch.



® SIMM is a registered trademark of WANG

SUGGESTED PWB LAYOUT



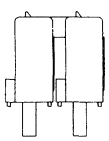
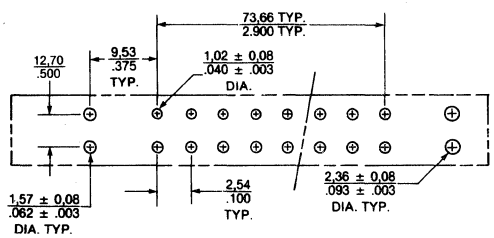


FIG. 2



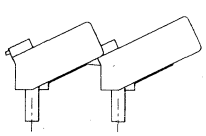


FIG. 4

FIG.	PART NUMBER	NO. OF CONTACTS	SOCKET TYPE	CONTACT MATERIAL	TAIL FINISH/ CONTACT FINISH
1 Single	2900-1TT-10301A	30	Single Vertical	Be Cu	Tin Lead/Tin Lead
	2900-1TG-10301A				Tin Lead/Gold
	2900-2TT-10301A			Phos. Bronze	Tin Lead/Tin Lead
	2900-2TG-10301A				Tin Lead/Gold
2 Dual	2900-1TT-10302B	60 (dual 30)	Dual Vertical .300" ℄	Be Cu	Tin Lead/Tin Lead
	2900-1TG-10302B				Tin Lead/Gold
	2900-2TT-10302B			Phos. Bronze	Tin Lead/Tin Lead
	2900-2TG-10302B				Tin Lead/Gold
	2900-1TT-10303B		Dual Vertical .400" ℄	Be Cu	Tin Lead/Tin Lead
	2900-1TG-10303B				Tin Lead/Gold
	2900-2TT-10303B			Phos. Bronze	Tin Lead/Tin Lead
	2900-2TG-10303B				Tin Lead/Gold

FIG.	PART NUMBER	NO. OF CONTACTS	SOCKET TYPE	CONTACT MATERIAL	TAIL FINISH/ CONTACT FINISH
3 Single	2900-1TT-20301A	30	Single Low Profile	Be Cu	Tin Lead/Tin Lead
	2900-1TG-20301A				Tin Lead/Gold
	2900-2TT-20301A			Phos. Bronze	Tin Lead/Tin Lead
	2900-2TG-20301A				Tin Lead/Gold
4 Dual	2900-1TT-20304B	60 (dual 30)	Dual Low Profile .300" ℄	Be Cu	Tin Lead/Tin Lead
	2900-1TG-20304B				Tin Lead/Gold
	2900-2TT-20304B			Phos. Bronze	Tin Lead/Tin Lead
	2900-2TG-20304B				Tin Lead/Gold

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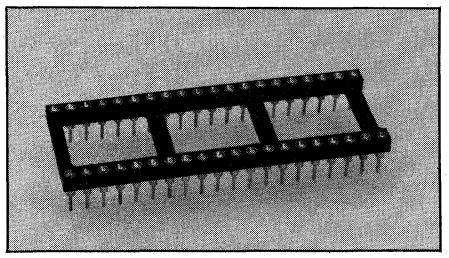
800 SERIES – FOUR FINGER CONTACT OPEN INSULATOR DIP SOCKETS



- Available in solid insulator
  (Ask for AUGAT 500 SERIES equivalent)

MATERIALS

Insulator	Thermoplastic Polyester Rated 94V-0
Outer Sleeve	Machined Brass/Formed Copper, Tin/Lead or Gold Plated.
Inner Contact	Machined Beryllium-Copper 30μ" Gold over Nickel, or Tin/Lead Plated ex. 8XX-AG11D
ES Contact	Stamped Beryllium-Copper 30μ" Gold over Nickel, or Tin/Lead Plated ex. 8XX-AG11D-ES
ESL Contact	Stamped Beryllium-Copper 10μ" Gold over Nickel or Tin/Lead Plated ex. 8XX-AG11D-ESL

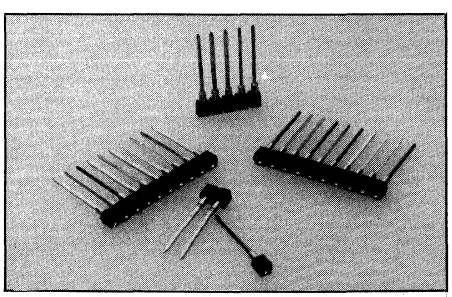
PART NUMBER

8 X X - A G X X X E S OR E S L

- 8 — 800 Series
- X X — Number of Contacts 8-64
- X X X — D–PC Termination; F–3-Level Solderless Wrap; F–2-2-Level Solderless Wrap
- E S OR E S L — Add for Augat Economy Series

.125 PC Tail		.180 Tail	
All socket sizes and 24 position (.600 Center)	10 – Gold Inner Contact/ Gold Outer Sleeve 11 – Gold Inner Contact/ Tin/Lead Outer Sleeve 12 – Tin/Lead Contact/ Tin/Lead Outer Sleeve	All socket sizes and 24 position (.600 Center)	45 – Gold/Gold 44 – Gold/Tin 43 – Tin/Tin
24 position (.300 Center)	30 – Gold/Gold 31 – Gold/Tin 32 – Tin/Tin	24 position (.300 Center)	48 – Gold/Gold 47 – Gold/Tin 46 – Tin/Tin
24 position (.400 Center)	65 – Gold/Gold 66 – Gold/Tin 14 – Tin/Tin	24 Position (.400 center)	448 – Gold/Gold 447 – Gold/Tin 446 – Tin/Tin

510 SERIES SOCKET TERMINAL STRIPS



PART NUMBER

5 1 0 - A G X X X - X X E S OR E S L

- 510 Series
- A G X X — Contact Plating / Sleeve Plating

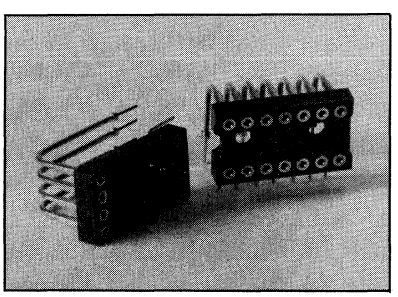
	Contact Plating	Sleeve Plating
90	Gold	Gold
91	Gold	Tin/Lead
92	Tin/Lead	Tin/Lead

- X X — Number of Positions 01 thru 20
- X — D–Printed Circuit; F–3-Level Solderless Wrap; F–2-2-Level Solderless Wrap
- E S OR E S L — Add for Augat Economy Series

No. of Contacts	A Max. mm/in.	No. of Contacts	A Max. mm/in.	No. of Contacts	A Max. mm/in.	No. of Contacts	A Max. mm/in.
5	12.70 .500	10	25.40 1.000	15	38.10 1.500	20	50.80 2.000

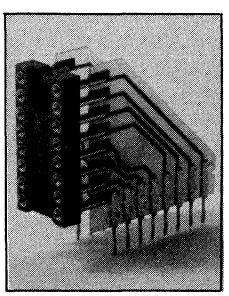
Note: For economy series eliminate dashes
example: 510AG91D20ES

NUMERICAL DISPLAY SOCKETS



Part Number	Fig.	No. of Contacts	Description
508-AG8D	1	8	Right angle mtg., printed circuit
508-AG4A	2		Horizontal mtg., 3 level solder pocket
508-AG4F			Horizontal mtg., 3 level solderless wrap
508-AG7D	3		Right angle mtg. printed circuit
514-AG7D		14	
516-AG7D		16	
518-AG7D		18	
520-AG7D		20	

LED NUMERIC DISPLAY SOCKETS



Part Number	No. of Contacts	Socket Angle
514-AG21D	14	90°
514-AG25D		45°
514-AG26D		60°
516-AG21D	16	90°
516-AG25D		45°
516-AG26D		60°

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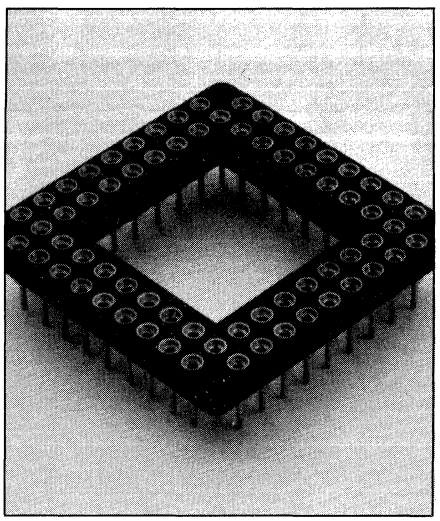
PGM SERIES

PIN GRID ARRAY SOCKETS



PART NUMBER IDENTIFICATION

P	G	M	X	X	X	-	1	A	X	X	X	X	-	V
Molded Plastic Insulator			Number of Pins			Pin Finish, Tin-Lead/.30µ Gold on contact		Pin Selection .125 Tail	Board Size		Pin Grid Footprint Options*			Low Insertion Force Contact

POPULAR PIN GRID FOOTPRINTS

Device	Augat Part Number
Motorola MC 68000	PGM068-1A1006-V
Motorola MC 68020	PGM114-1A1345-V
Motorola MC 68030	PGM128-1A1359-V
Motorola MC 68040	PGM179-1A1814-V
Motorola DSP56001	PGM088-1A1373-V
Intel 80186	PGM068-1A1133-V
Intel 80286	PGM068-1A1133-V
Intel 80386	PGM132-1A1415-V
National NS32532	PGM175-1A1614-V
XiLinx XL3090	PGM175-1A1616-V

- Available with PC tails, wire wrap and adapter pins
- Hundreds of footprints
- Molded plastic and hi-temp insulators
- Variety of plating options
- Custom design capabilities

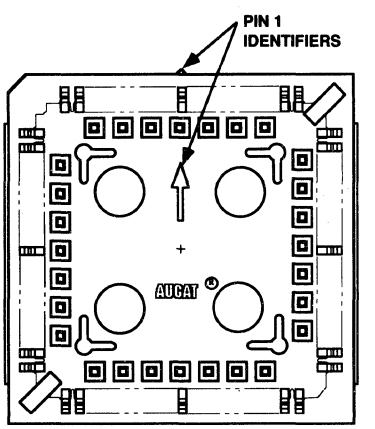
PCS SERIES

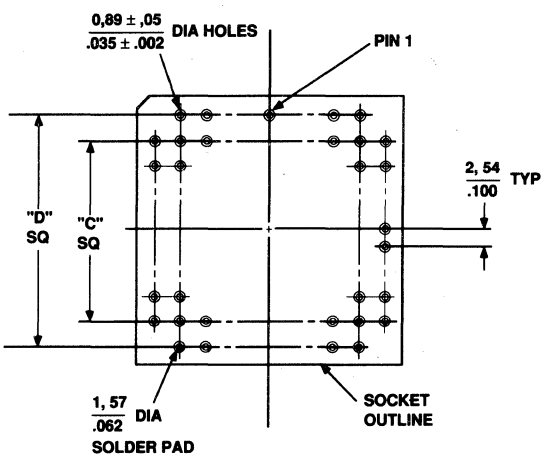
PLCC SOCKETS

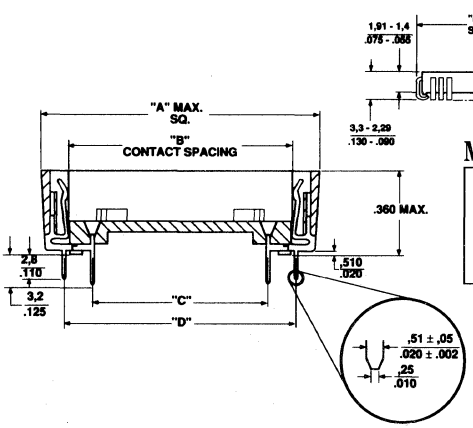
- Available in 68 and 84 positions.
- Standoffs and four drain holes aid in cleaning.
- Easy access for probing installed chip carrier.

DIMENSIONS mm/inch

PART NUMBER	A	B ±,10 / ±.004	C	D	E
PCS-068A-1	30,22 / 1.190	24,46 / .955	20,32 / .800	25,40 / 1.000	25,27/25,02 / .995/.985
PCS-084A-1	35,31 / 1.390	29,34 / 1.155	25,40 / 1.000	30,48 / 1.200	30,35/30,1 / 1.195/1.185







MATERIALS

INSULATOR	• Polyphenylene Sulfide, 40% Glass filled, UL Rated 94V-0
CONTACT PLATING	• Phosphor Bronze • Tin/Lead over Nickel

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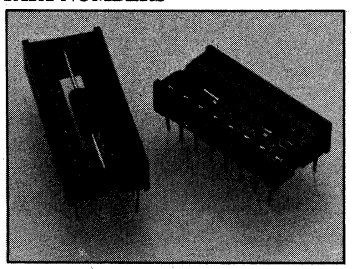
200 ACB SERIES – STAMPED SINGLE BEAM CONTACT DECOUPLING SOCKETS

PART NUMBERS



No. of Contacts	Contact Mat'l	.01μf Capacitor		.10μf Capacitor		.33μf Capacitor	
		Standard P.C. tall	*.035" retention pin	Standard P.C. tall	*.035" retention pin	Standard P.C. tall	*.035" retention pin
14	Copper Alloy	214-ACB29D-N01	214-ACB129D-N01	214-ACB129D-N10	214-ACB129D-N10	214-ACB29D-N33	214-ACB129D-N33
	BeCu	214-ACB39D-N01	214-ACB139D-N01	214-ACB39D-N10	214-ACB139D-N10	214-ACB39D-N33	214-ACB139D-N33
16	Copper Alloy	215-ACB29D-N01	216-ACB129D-N01	216-ACB29D-N10	216-ACB129D-N10	216-ACB29D-N33	216-ACB129D-N33
	BeCu	216-ACB39D-N01	216-ACB139D-N01	216-ACB39D-N10	216-ACB139D-N10	216-ACB39D-N33	216-ACB139D-N33
18	Copper Alloy	218-ACB29D-N01	218-ACB129D-N01	218-ACB29D-N10	218-ACB129D-N10	218-ACB29D-N33	218-ACB129D-N33
	BeCu	218-ACB39D-N01	218-ACB139D-N01	218-ACB39D-N10	218-ACB139D-N10	218-ACB39D-N33	218-ACB139D-N33
20	Copper Alloy	220-ACB29D-N01	220-ACB129D-N01	220-ACB29D-N10	220-ACB129D-N10	220-ACB29D-N33	220-ACB129D-N33
	BeCu	220-ACB39D-N01	220-ACB139D-N01	220-ACB39D-N10	220-ACB139D-N10	220-ACB39D-N33	220-ACB139D-N33

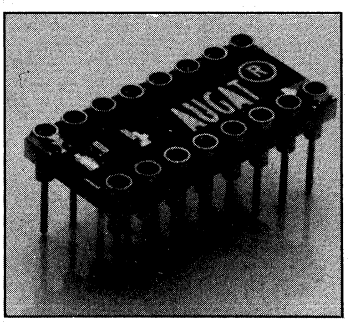
*press-fit retention feature for .035" ± .003" Plated-Through Hole

NOTE: Socket is available without capacitor: substitute CB for ACB and delete last three digits, example P/N: 216-CB39D.

MATERIALS

Insulator: Thermoplastic Polyester Rated 94V-0
Contacts: Beryllium Copper (Per QQ-C-533) or Copper Alloy (CDA 688)/PH. BR. (EDA 521)
Plating: Tin/Lead (Per MIL-P-81728)

DS SERIES 4-BEAM CONTACT DIP DECOUPLING SOCKETS



PART NUMBER (example: DS2-316-2AR)

D S X – X X X – X X R

- SERIES
- CAPACITOR VALUE: 1 – .01μF; 2 – .10μF; 3 – .33μF
- *ROW SPACING: 3 – .300"; 4 – .400"; 6 – .600"
- *CONTACT NUMBER: 8 – 48
- FINISH TERM/CONTACT: 1 – Tin-Lead/30μ" Gold; 2 – 10μ" Gold/30μ" Gold; 3 – Tin-Lead/Tin-Lead
- TERMINATION: A – PC-.125" Tail; B – PC-.180" Tail; C – Solderless 3 level wrap

- Designed to meet military requirements
- Custom designs available, consult factory.

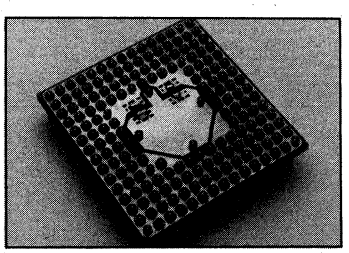
MATERIALS

Insulator • Glass Epoxy. Circuit Fabricated to Meet Mil-P-55110
Inner Contact • Beryllium Copper 30μ" Gold over Nickel or Tin Lead Plated.
Outer Sleeve • Brass; Tin Lead or 10μ" Gold Plated.

APPLICATION DIMENSIONS

- PCB Hole Size Range: .035" ± .003" Solder Termination, .055" ± .0015" Solderless Wrap
- IC Pin Dimension Range: .016" to .021" Dia., .125" minimum length

PGD SERIES 4-BEAM CONTACT PGA DECOUPLING SOCKETS



PART NUMBER (example: PGD-001-1A1)

P G X – X X X – X X X

- SERIES: D – DEDICATED; U – UNIVERSAL
- DEVICE CODE: CONSULT FACTORY FOR DEDICATED ITEMS SEE "PGD" CHART
- FINISH TERM/CONTACT: 1 – Tin-Lead/30μ" Gold; 2 – 10μ" Gold/30μ" Gold; 3 – Tin-Lead/Tin-Lead
- TERMINATION: A – PC-.125" Tail; B – PC-.180" Tail; C – 3 Level Wrap
- CAPACITOR VALUE: 1: 10μF, 1.0μF

- PGD Series parts are dedicated to accommodate specific devices.
- Designed to meet military requirements.
- Augat will tool socket for any standard PGA device.

PGD-SERIES

DEDICATED FOR SPECIFIC DEVICES

DEVICE	AUGAT P/N
Motorola MC68000	PGD-001-XXX
Motorola MC68012	PGD-002-XXX
Motorola MC68440	PGD-003-XXX
Motorola MC68605	PGD-004-XXX
Intel 80386	PGD-005-XXX
Intel 80186	PGD-006-XXX
Intel 8096-90	PGD-007-XXX
Analog Devices ADSP-1016	PGD-008-XXX
Analog Devices ADSP-1024	PGD-009-XXX
Hitachi HD68000Y	PGD-010-XXX

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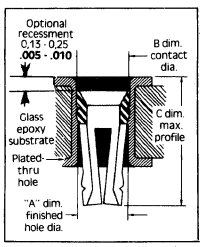
HOLTITE SERIES – ZERO-PROFILE SOLDERLESS SOCKETS

BULK CONTACT PART NUMBER INFORMATION

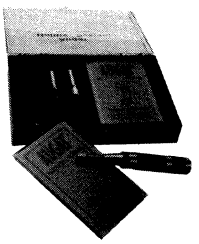
HOLTITE Part Number	Contact Material & Finish	Recommended Lead Size	Recommended Primary Drill Size	A Dim. Finished Plated-Thru Hole Size	B Dim. Contact Dia.	C Dim. Maximum Profile	Board Thickness	Plated-Thru Hole Finish
8134-HC-5P2 (gold)	Beryllium copper gold-plated	Rectangular Lead 0,28x0,46 (+0,05) .011x.018 (± .002) or Round Lead 0,406-0,533 .016-.021 Diameter	1,15 .0453	1,04 ± 0,05 .041 ± .002	1,12 ± 0,01 .044 ± .0005	2,72 .107		0,0076-0,0127 .0003-.0005 Electro-deposited tin/lead over 0,0254 .001 Min. Thick electro deposited copper plate
8134-HC-5P3 (tin/lead)	Beryllium copper tin/lead plated							
8134-HC-6P2 (gold)	Beryllium copper gold-plated	Round Lead 0,51-0,76 .020-.030 Diameter	1/16					
8134-HC-6P3 (tin/lead)	Beryllium copper tin/lead plated							
8134-HC-8P2 (gold)	Beryllium copper gold-plated	Round Lead 0,64-0,89 .025-.035 Diameter Also suitable for use with .025 sq. post	1,59 .0625	1,45 ± 0,05 .057 ± .002	1,59 ± 0,01 .0625 ± .0005	3,56 .140 (unrecessed)	0,75 .030 and over	
8134-HC-8P3 (tin/lead)	Beryllium copper tin/lead plated							
8134-HC-12P2 (gold)	Beryllium copper gold-plated	Round Lead 0,89-1,14 .035-.045	2,18 .0860 #44 drill	2,06 ± 0,05 .081 ± .002	2,18 ± 0,01 .0860 ± .0005	4,06 .180 (unrecessed)	1,27 .050 and over	
8134-HC-12P3 (tin/lead)	Beryllium copper tin/lead plated							

The Holtite "Starter" Kit is designed for limited prototyping. The kit consists of 1000-5P and 200-6P contacts, combination insertion tool and NO-GO gages for each, and a spring loaded seating tool:



8134-HC-5P style shown

Cross-section view shows Augat press fitted HOLTITE® precision-machined contact.



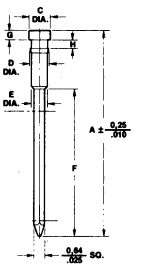
HOLTITE® KITS:
398-HK-001-Gold Holtites
398-HK-002-Tin/Lead Holtites

MATERIALS

Contact, Beryllium Copper per QQ-C-530
Finish, Gold-plated .000030" per MIL-G-45204 Over Nickel per QQ-N-290, or Tin/Lead

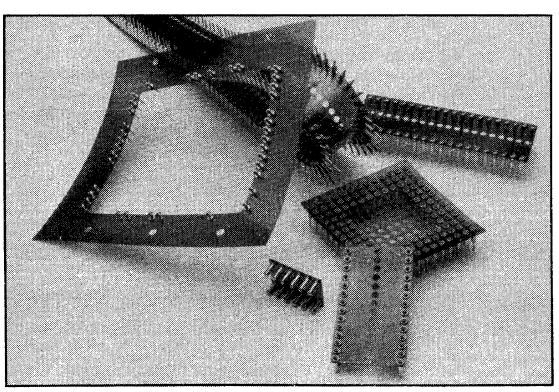
LSG SERIES – SOCKET TERMINALS

Part Number	Pin Dia. Range	Pin Length Range	A dim. mm/in.	B dim. ± .002 mm/in.	C dim. ± .003 mm/in.	D dim. ± .003 mm/in.	E dim. ± .003 mm/in.	F dim. ± .010 mm/in.	G dim. ± .010 mm/in.	H dim. mm/in.	Contact Finish	Sleeve Finish	Recommended Mounting Hole
LSG-1FG1-1	0,41-0,53 .016-.021	3,18-3,99 .125-.157	17,86 .703	– –	0,83 .072	1,57 .062	1,32 .052	12,95 .510	0,76 .030	0,71 .028	Gold	Gold	#54 Drill 1,40/.055 Dia. Ref.
LSG-1FG1-14												Tin	
LSG-1FG6-1			14,30 .563	– –				9,40 .370				Gold	
LSG-1FG6-14												Tin	
LSG-1FG10-1			11,51 .453	– –				6,60 .260				Gold	
LSG-1FG10-14												Tin	



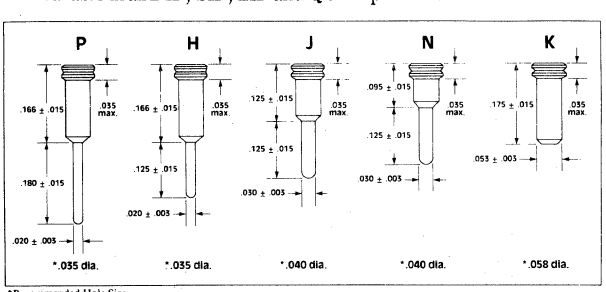
THE VisInPak™ FAMILY OF SOCKETS

Uncover solder defects with the Visual Inspection Package Sockets. Removable carrier, improved airflow and unlimited footprint flexability!



- Ultra low profile version only .040 max above P.C. board
- Socket will retain minimum component lead length
- With ultra-low sockets installed circuit boards can be mounted on .400" centerline spacing
- Maximizes air flow across pin grid device
- Carrier will withstand up to 400°C for application of vapor phase or infrared soldering.
- Removable carrier improves cleaning and inspection of solder joints
- Insulator: Kapton® Dupont High Temperature or equivalent
- Custom design capability

- Available in all DIP, SIP, ZIP and QUAD patterns



*Recommended Hole Size

M X K – X X X X – R X X

- C = SIP, or DIP; Z = ZIP; Q = QUAD
- CONTACT SELECTION: R = Stamped; H = Machined
- PIN SELECTION
- CONTACT PLATING: G = 10μ" Gold; H = 30μ" Gold; T = Tin/Lead
- SLEEVE PLATING: G = 10μ" Gold; T = Tin/Lead
- ROW SPACING: 0 = SIP; 1 = QUAD or ZIP; 3 = .300" ℄; 4 = .400" ℄; 6 = .600" ℄; 9 = .900" ℄
- NO. OF POSITION

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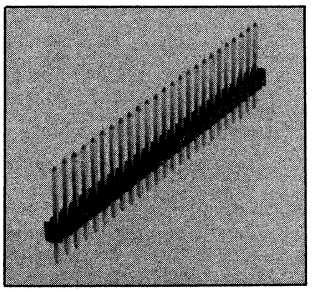
MODULAR INTERCONNECTION SYSTEM (MIS)

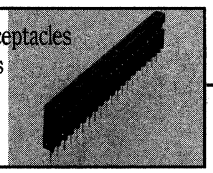
PWB HEADERS

Dimensions mm/inch

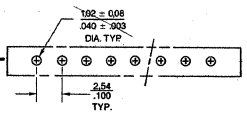
2,54/100" Centers
Single Row, Straight Post
A011 Series

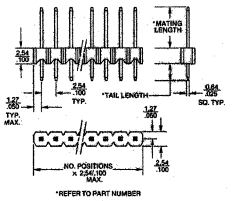


Mating Receptacles
A010 Series

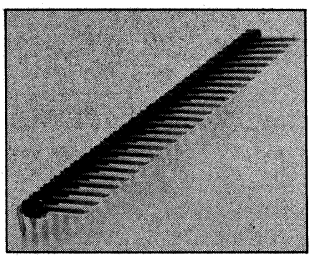


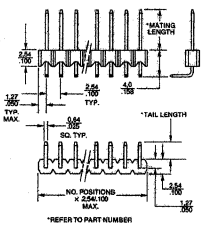
Recommended Mounting



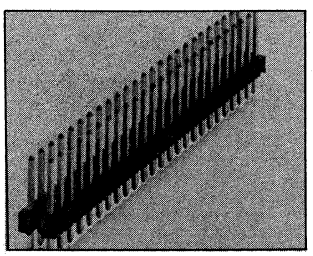


2,54/100" Centers
Single Row, Right Angle Post
A012 Series

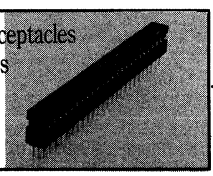




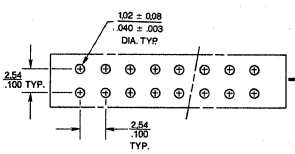
2,54/100" × 2,54/100" Centers
Dual Row, Straight Post
A016 Series

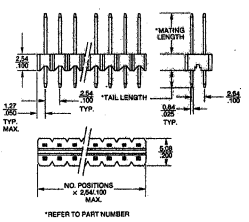


Mating Receptacles
A015 Series

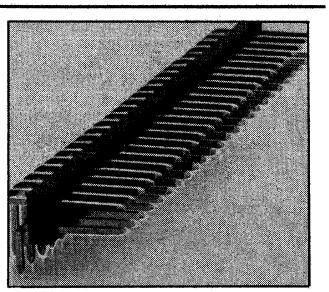


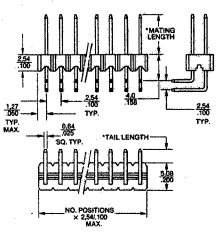
Recommended Mounting





2,54/100" × 2,54/100" Centers
Dual Row, Right Angle Post
A017 Series





PART NUMBER

A	0	1	1	-	0	2	5	-	Y	C	-	5	0	1

MATING CENTERLINE
2,54/100"

TYPE
011: Straight – Single Row
012: Right Angle – Single Row
016: Straight – Dual Row
017: Right Angle – Dual Row

NUMBER OF POSTS
001 to 050 Single Row
002 to 100 Dual Row

*PLATING
A: Gold 10µ"
B: Pre-Tin Lead 150µ"
C: Selective Gold 10µ"
E: Selective Gold 30µ"

*MATING LENGTHS	*TAIL LENGTHS
501: 6,8/**.268"**	2,9/**.114"**
502: 6,8/**.268"**	3,7/**.146"**
511: 5,9/**.232"**	2,9/**.114"**
512: 5,9/**.232"**	3,7/**.146"**
531: 8,0/**.315"**	2,9/**.114"**
532: 8,0/**.315"**	3,7/**.146"**

*Other plating and lengths available upon request.

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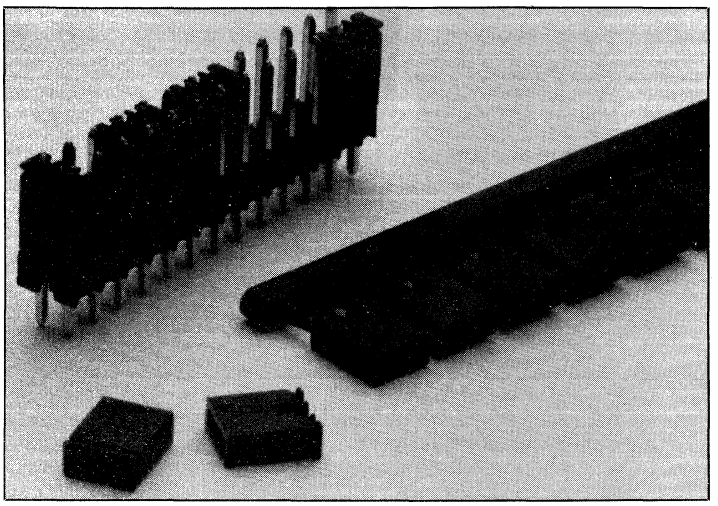
MODULAR INTERCONNECTION SYSTEM (MIS) SHUNTS

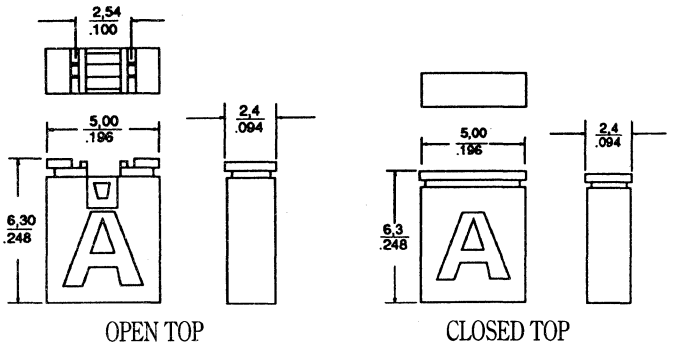
The Augat A080 Series Shunts which common 0,64 /.025"² posts for switching and programming applications from Augat's growing line of interconnections.



FEATURES:

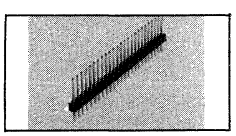
- Stackable end to end, side to side on 2,54/100" centers
- Low Profile 6,35/.250" above board
- Open or closed top for application versatility
- Packaged 25 shunts per strip for ease of handling and inventory
- Mates with 0,64/025"² post or round pins
- Solderless for easy on/off application

Dimensions
mm
INCH

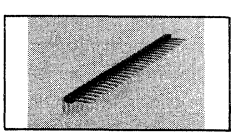


MIS MATING HEADERS

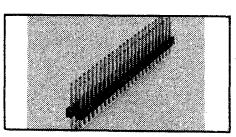
A011



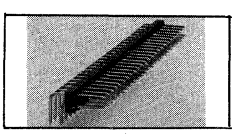
A012



A016



A017



HOW TO ORDER

Part Number	*Packaging	Insulator Top	*Plating	*Color
A080-003-0A-001	25 PER STRIP	Open	Gold 10μ"	Black
A080-003-0E-001			Gold 30μ"	
A080-003-0B-001			Tin Lead	
A080-002-0A-001		Closed	Gold 10μ"	
A080-002-0E-001			Gold 30μ"	
A080-002-0B-001			Tin Lead	

NOTE: SOLD IN MULTIPLES OF 25 ONLY

* Loose pieces, different plating, and different color options available upon request

AUGAT® Quality and Innovation

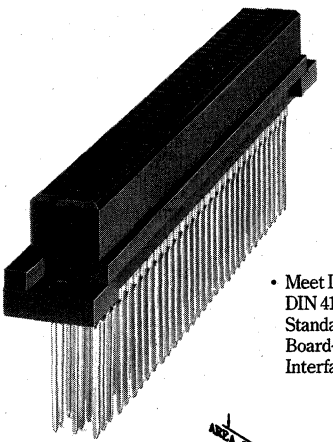
AUGAT INC., INTERCONNECTION PRODUCTS GROUP
33 Perry Ave., P.O. Box 779, Attleboro, MA 02703 (508) 222-2202 FAX (508) 222-0693
CUSTOMER SERVICE/INSIDE SALES:
452 John Dietsch Blvd., Attleboro Falls, MA 02763 Tel. (508) 699-9800 FAX (508) 699-6717

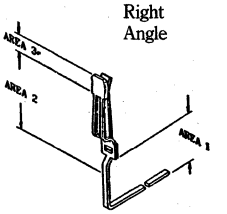
PC BOARD CONNECTORS

INVERSE AND STANDARD DIN CONNECTORS

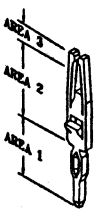
Feature glass-filled polyester insulator, UL rated 94V-0. Copper alloy contacts, per Federal Spec QQ-B-750, are plated as follows (see illustrations): Inverse male, area 1 – 5μ" gold; area 2 – 5μ" gold; area 3 – 20μ" gold. Inverse female, area 1 – 150/200μ" 90 tin/10 lead; area 2 – nickel; area 3 – 20μ" gold. Standard female, area 1 – 5μ" gold; area 2 – 5μ" gold; area 3 – 20μ" gold. Dielectric withstanding: ≥ 1000Vrms, 60 Hz. Inverse male connectors used on backplane, while right angle female is on module card. Standard female is on backplane or rack mounted. All units are 32 contacts/row. Temperature rating: –55° to 120°C.

Type	Description
INVERSE MALE DIN CONNECTORS	
43-0105-032	Press Fit, All Rows Loaded, .715" Tail
43-0102-032	Press Fit, All Rows Loaded, .518" Tail
INVERSE FEMALE RIGHT ANGLE DIN CONNECTORS	
43-1200-832	All Rows Loaded, No Tail
STANDARD FEMALE DIN CONNECTORS	
43-3100-032	Press Fit, All Rows Loaded, .188" Tail
43-3105-032	Press Fit, All Rows Loaded, .635" Tail

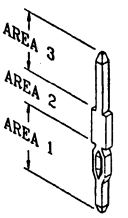




- Meet International DIN 41612 Standards for Board-to-Board Interface Devices



Standard Female

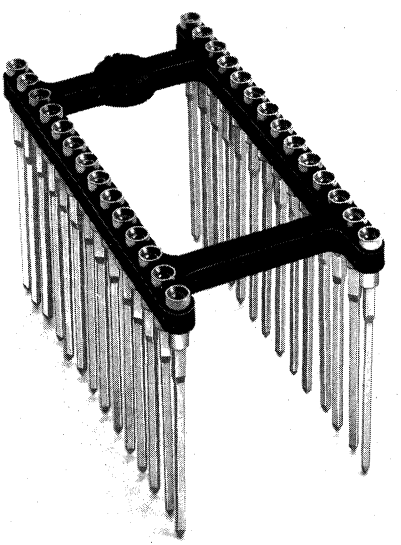


Inverse Male

SOC PAC™ SIP AND DIP IC SOCKETS

Press-fit SIP and DIP IC sockets provide increase in circuit density, improved IC circulation and reduced external wiring. All have .020" diameter no-wrap tails, and feature glass-filled polyester insulator, rated UL 94V-0. Spring contact is beryllium copper, per QQ-B-750, and is gold plated 30μ" over 50μ" nickel. Brass body contacts are either 150/200μ" 90 tin/10 lead plated per MIL-T-1027 type 1 or 5μ" gold plated per MIL-G 45024 type 1. Current rating: 3A per contact. Temperature range: –55° to 120°C. All have .100 bullet.

Type	Description
45-0110-208	SIP, Tin-Plate Contact, 8 Contacts
45-0110-210	SIP, Tin-Plate Contact, 10 Contacts
45-0110-220	SIP, Tin-Plate Contact, 20 Contacts
45-0110-256	SIP, Tin-Plate Contact, 56 Contacts
45-0110-008	SIP, Gold-Plate Contact, 8 Contacts
45-0110-010	SIP, Gold-Plate Contact, 10 Contacts
45-0110-056	SIP, Gold-Plate Contact, 56 Contacts
45-1110-008	.1x.3 DIP, Gold-Plate, 8 Contacts
45-1110-014	.1x.3 DIP, Gold-Plate, 10 Contacts
45-1110-016	.1x.3 DIP, Gold-Plate, 16 Contacts
45-2110-024	.1x.6 DIP, Gold-Plate, 24 Contacts
45-2110-028	.1x.6 DIP, Gold-Plate, 28 Contacts
45-2110-036	.1x.6 DIP, Gold-Plate, 36 Contacts
45-2110-040	.1x.6 DIP, Gold-Plate, 40 Contacts

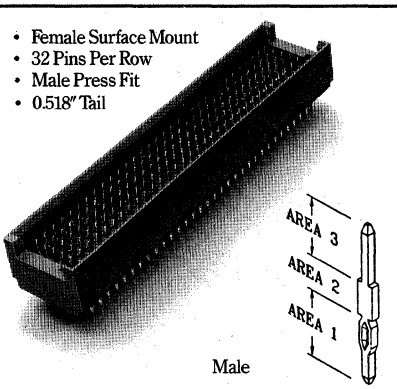


6-ROW DOUBLE DIN™ CONNECTORS

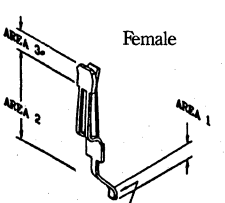
Series I has contact row spacing of continuous 0.100" center lines, and fit standard 0.062" thick board. Series II has contact spacing of 3 rows 0.100" centers, 0.200" space, 3 rows 0.100" centers. Fit boards 0.125" thick. Male contacts phosphor bronze with plating as follows (see illustration above): area 1 – 5μ" gold; area 2 – 5μ" gold; area 3 – 30μ" gold. Female contacts copper alloy with plating: area 1 – 750/1000μ" 60 tin/40 lead; area 2 – unplated; area 3 – 20μ" gold: with 50/100μ" nickel undercoat.

Type	Description
40-6110-832	Female with Flange, Series I
40-6212-832	Female with Flange, Series II
40-7101-132	Male with No Flange, Series I
40-7201-132	Male with No Flange, Series II

- Female Surface Mount
- 32 Pins Per Row
- Male Press Fit
- 0.518" Tail



Male



Area 1 Denotes Contact Engagement Area Solder to PC Board Only

Amphenol
SPECTRA-STRIP

CABLE & CONNECTORS

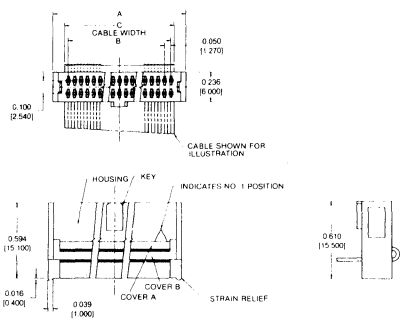
AMPHENOL® HIGH DENSITY 25 MIL IDC/845 SERIES

845 SERIES—SOCKETS

Amphenol high density 25 MIL IDC sockets, featuring 0.025″ contact spacing, are designed for use in condensed FRC wiring applications on printed circuit boards in computers and other electronic equipment.

CHARACTERISTICS

Contact plating: Gold flash over Nickel
Contact spacing: 0.05″ grid on 0.025″ centers
Insulation resistance: 5,000 M Ω minimum at 500 VDC
Current rating: 0.5 amps



No. of Contact Positions	Dimensions inches/millimeters A	B = NX .050 (1.27) N	B	C
10	.436 (11.08)	N = 6	.200 (5.08)	.250 (6.35)
16	.586 (14.89)	N = 7	.350 (8.89)	.400 (10.16)
20	.686 (17.43)	N = 9	.450 (11.43)	.500 (12.70)
26	.836 (21.24)	N = 12	.600 (15.24)	.650 (16.51)
34	1.036 (26.32)	N = 16	.800 (20.32)	.850 (21.59)
40	1.186 (30.13)	N = 19	.950 (24.13)	1.000 (25.40)
50	1.436 (36.48)	N = 24	1.200 (30.48)	1.250 (31.75)
60	1.686 (42.83)	N = 29	1.450 (36.83)	1.500 (38.10)
64	1.786 (45.37)	N = 31	1.550 (39.37)	1.600 (40.64)
80	2.186 (55.53)	N = 39	1.950 (49.53)	2.000 (50.80)
100	2.686 (68.22)	N = 49	2.450 (62.26)	2.500 (63.50)

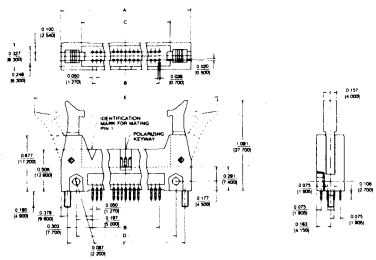
845 SERIES—HEADERS

Amphenol high density 25 MIL IDC headers, featuring 0.025″ contact spacing, are designed for use in condensed FRC wiring applications on printed circuit boards in computers and other electronic equipment.

Fully shrouded 25 MIL headers are available in either straight, or right angle solder tails. Both styles are available with optional, factory-installed, long lock and eject latching arms.

CHARACTERISTICS

Contact plating: Gold flash over Nickel
Contact spacing: 0.05″ grid on 0.025″ centers
Insulation resistance: 5,000 M Ω minimum at 500 VDC
Current rating: 0.5 amps



No. of Contact Positions	Dimensions inches/millimeters A	B = NX .050 (1.27) N	B	C	D	E	F
10	.956 (24.28)	N = 4	.200 (5.08)	.456 (11.58)	.594 (15.08)	1.583 (40.20)	.806 (20.48)
16	1.106 (28.09)	N = 7	.350 (8.89)	.606 (15.39)	.744 (18.89)	1.732 (44.00)	.956 (24.29)
20	1.206 (30.63)	N = 9	.450 (11.43)	.706 (17.93)	.844 (21.43)	1.835 (46.60)	1.056 (26.83)
26	1.356 (34.44)	N = 12	.600 (15.24)	.856 (21.74)	.994 (25.24)	1.984 (50.40)	1.206 (30.64)
34	1.556 (39.52)	N = 16	.800 (20.32)	1.056 (26.82)	1.194 (30.32)	2.185 (55.50)	1.406 (35.72)
40	1.706 (43.33)	N = 19	.950 (24.13)	1.206 (30.63)	1.344 (34.13)	2.335 (59.30)	1.556 (39.53)
50	1.956 (49.68)	N = 24	1.200 (30.48)	1.456 (36.98)	1.594 (40.48)	2.583 (65.50)	1.806 (45.88)
60	2.206 (56.03)	N = 29	1.450 (36.83)	1.706 (43.33)	1.844 (46.83)	2.835 (72.00)	2.056 (52.23)
64	2.306 (58.57)	N = 31	1.550 (39.37)	1.806 (45.87)	1.944 (49.37)	2.933 (74.50)	2.156 (54.77)
80	2.706 (68.73)	N = 39	1.950 (49.53)	2.206 (56.03)	2.344 (59.53)	3.433 (87.20)	2.556 (64.93)
100	3.206 (81.43)	N = 49	2.450 (62.23)	2.706 (68.73)	2.844 (72.24)	3.835 (97.41)	3.056 (77.62)

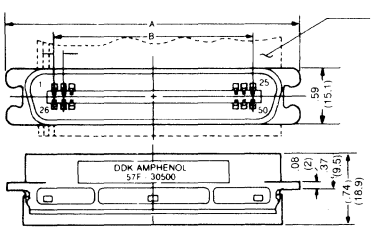
AMPHENOL® ALL-PLASTIC PLUG AND RECEPTACLE—850-57F SERIES

The Amphenol 85057F series micro-ribbon connectors have a special contact design which allows use of standard .050″ (1,27mm) flat cable in conjunction with standard .085″ (2,16mm) contact center spacing. Sturdy construction allows repeated mating and unmating without displacement of contacts and provided stability for quality termination to many types of flat cable.

CHARACTERISTICS

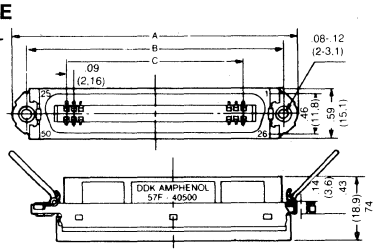
Contact spacing: .085″ (2,16mm)—terminates to standard .050″ (1,27mm) flat cable
Contact area plating: Gold over nickel
Standards: RS-232 and RS-449
Current rating: 1 amp
Insulation resistance: 1000 M ohm min. at 500V DC

PLUG



Number of Contacts	Dimensions—inches (mm) A		B	
14	1.490	(37,8)	.51	(12,96)
24	1.913	(48,6)	.935	(23,76)
36	2.425	(61,6)	1.446	(36,72)
50	3.008	(76,4)	2.041	(51,84)

RECEPTACLE



Number of Contacts	Dimensions—inches (mm) A		B		C		D		E	
14	1.73	(44,0)	1.41	(36,0)	.51	(12,96)	1.40	(35,5)	1.37	(34,7)
24	2.15	(54,7)	1.84	(46,8)	.935	(23,76)	1.84	(46,8)	1.80	(45,8)
36	2.67	(67,7)	2.35	(59,7)	1.45	(36,72)	2.35	(51,7)	2.31	(58,7)
50	3.26	(82,8)	2.95	(74,9)	2.04	(51,84)	2.95	(74,9)	2.91	(73,9)

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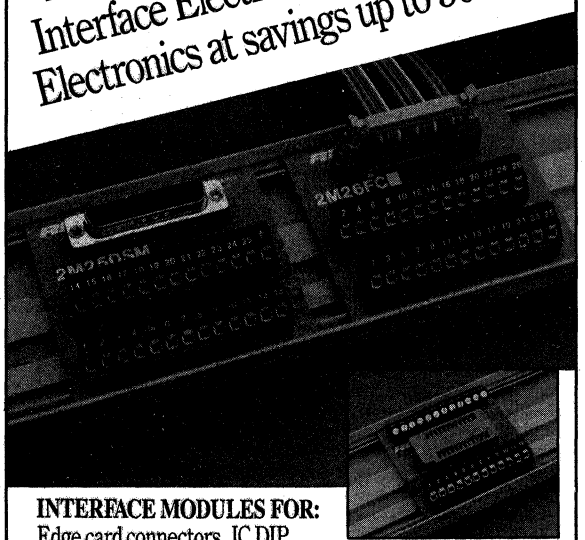
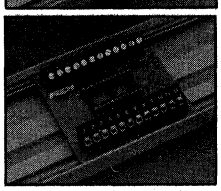
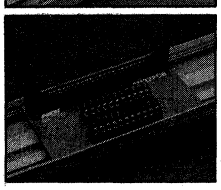
Quality and Innovation

AUGAT INC., REED DEVICES, INC.
525 Randy Road, Carol Stream, Illinois 60188 Tel. (312) 682-4100 FAX 312-682-4562

NOW... There's a Better, Faster Way to Interface Electrical Wiring with Electronics at savings up to 50%!



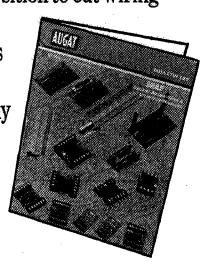




INTERFACE MODULES FOR:
Edge card connectors, IC DIP and ZIF (zero insertion force) sockets, Flat cable connectors, D-Subminiature metal connectors, and more

- Available in a wide range of standard lead counts
- Mountable on standard DIN rail modular systems or SNAPTRACK®
- Based on 2M Series terminal blocks
- Discrete wiring interface provided through terminal block arrays
- Screws/terminals in ready-to-wire position to cut wiring time in half
- Semi-custom and full-custom options available
- Offers more design flexibility than any other system. (If you don't see what you need, just ASK!)

Ask us about our full line of Terminal Blocks and SNAPTRACK® Flat Cable Connector, Relay & Timer Socket Assemblies



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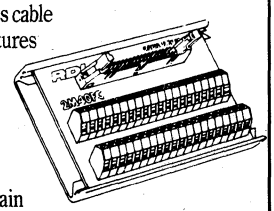
FLAT CABLE CONNECTOR SYSTEM TERMINAL BLOCK INTERFACE

Converts Flat Cable for Field Wiring
Daisy Chain Possible
Flat cable connector system makes cable and wire management easier. Features 4-sided notched sockets to assure correct polarity connections. Rated 1 amp, system consists of gold over nickel-plated, 94V-0 thermoplastic header; gold over nickel-plated beryllium copper strain relief connector with 26-30AWG solid, 28AWG stranded wire range; 12-22AWG wire range terminal block with 3-48 screws. System mounts 2TK and 2TKD series SNAPTRACK,® shown on the previous page.

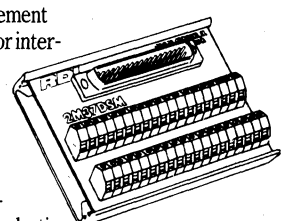


Type	Description	Length
2M10FC	10-Pin Header	1.50″
2M14FC	14-Pin Header	2.10″
2M16FC	16-Pin Header	2.30″
2M20FC	20-Pin Header	2.70″
2M26FC	26-Pin Header	3.20″
2M34FC	34-Pin Header	4.10″
2M40FC	40-Pin Header	4.70″
2M50FC	50-Pin Header	5.50″
2M60FC	60-Pin Header	6.50″
2M64FC	64-Pin Header	6.70″

D-SUBMINIATURE CONNECTOR TERMINAL BLOCK INTERFACE

- Converts D-Subminiature Connectors to Field Wiring
- Terminals Ready to Wire
- Easier Wire and Cable Management

These D-subminiature connector interfaces feature a metal shielded connector for mating with EMI-RFI qualified cable and screw position with grounding path to connector shell. Connectors are gold over nickel-plated brass, with 94V-O thermoplastic polyester housing and bright tin-plated shells. Terminals are acid-tin-plated brass. Screws 3-48 steel. Wire range 12-22AWG. Mount 2TK and 2TKD series SNAPTRACK®



Type	Description	Length
2M09DSM	9-Pin Connector	1.50″
2M15DSM	15-Pin Connector	2.10″
2M25DSM	25-Pin Connector	3.10″
2M37DSM	37-Pin Connector	4.31″
2M50DSM	50-Pin Connector	5.93″

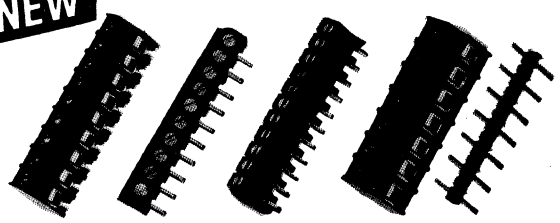
When you are faced with an application that has unique features, RDI can help.

Our design engineers will work with you to customize PC boards and interface modules with our products.

AUGAT RDI

SUBMINIATURE TERMINAL BLOCKS .2" CENTERS

NEW



2MV Series Vertical | 2MR Series Right Angle | 2MA Series 45° Angle | 2MDV Series Depluggable

AMERICAN DESIGNED AND MADE

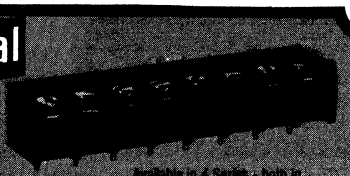
Thermoplastic Polyester

- Maintains Center-to-Center Spacing
- Subminiature-only .5" (12,7) high
- 2-24 positions*
- Stand-offs for flux cleaning
- Captive 3-48 UNC American screws
- Wide entry for stranded/multiple wires, or up to #12 AWG
- Rating 20A, 300V; UL recognized

RDI Cat. No. (Partial)	RDI Cat. No. (Partial)	RDI Cat. No. (Partial)	RDI Cat. No. (Partial)	Center to Center Length	
				inches	mm
2MV-02	2MR-02	2MA-02	2MDV-02	0.2	5,1
2MV-04	2MR-04	2MA-04	2MDV-04	0.6	15,2
2MV-06	2MR-06	2MA-06	2MDV-06	1.0	25,4
2MV-10	2MR-10	2MA-10	2MDV-10	1.8	45,7
2MV-12	2MR-12	2MA-12	2MDV-12	2.2	55,9
2MV-16	2MR-16	2MA-16	2MDV-16*	3.0	76,2
2MV-24	2MR-24	2MA-24		4.6	116,8

*2MDV series not available over 16 positions

The Original Tri-Barrier Terminal Blocks



Available in 4 Series - both in Vertical & Rt. Angle Mount
3 PCV, 3 PCR - .250" C-C
4 PCV, 4 PCR - .325" C-C
6 PCV, 6 PCR - .375" C-C
8 PCV, 8 PCR - .4375" C-C

Resilient Thermoplastic

- Back barrier safeguards components, stops shorting of adjacent wires
- Wire-clamping plate screws secure 2 different ga. wires without wire lugs
- Stand-offs for flux cleaning
- Wire-ready raised screws
- UL-grade (94V-0) thermoplastic
- Wide choice of termination styles

VERTICAL MOUNT

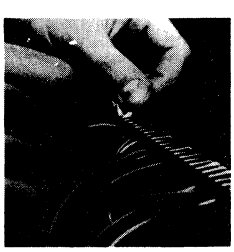
RDI Cat. No.	PC Ctr. Len. (in.)	RDI Cat. No.	PC Ctr. Len. (in.)	RDI Cat. No.	PC Ctr. Len. (in.)	RDI Cat. No.	PC Ctr. Len. (in.)
				6PCV-02	.83	8PCV-02	.95
				6PCV-03	1.21	8PCV-03	1.38
3PCV-04	1.07	4PCV-04	1.38	6PCV-04	1.58	8PCV-04	1.82
3PCV-05	1.32	4PCV-05	1.71	6PCV-05	1.96	8PCV-05	2.26
3PCV-06	1.57	4PCV-06	2.03	6PCV-06	2.33	8PCV-06	2.70
3PCV-07	1.82	4PCV-07	2.36	6PCV-07	2.71	8PCV-07	3.13
3PCV-08	2.07	4PCV-08	2.68	6PCV-08	3.08	8PCV-08	3.57
3PCV-09	2.32	4PCV-09	3.01	6PCV-09	3.46	8PCV-09	4.01
3PCV-10	2.57	4PCV-10	3.33	6PCV-10	3.83	8PCV-10	4.45
.250" C-C H .50" W .55" 5 Amps, 150V Avail. to 32 Positions		.325" C-C H .50" W .60" 20 Amps, 150V Avail. to 30 Positions		.375" C-C H .60" W .70" 25 Amps, 300V Avail. to 28 Positions		.4375" C-C H .70" W .80" 25 Amps, 300V Avail. to 26 Positions	

RIGHT ANGLE MOUNT

RDI Cat. No.	Len. (in.)	RDI Cat. No.	Len. (in.)	RDI Cat. No.	Len. (in.)	RDI Cat. No.	Len. (in.)
3PCR-02	.57	4PCR-02	.73	6PCR-02	.83	8PCR-02	.95
3PCR-03	.82	4PCR-03	1.06	6PCR-03	1.21	8PCR-03	1.38
3PCR-04	1.07	4PCR-04	1.38	6PCR-04	1.58	8PCR-04	1.82
3PCR-05	1.32	4PCR-05	1.71	6PCR-05	1.96	8PCR-05	2.26
3PCR-06	1.57	4PCR-06	2.03	6PCR-06	2.33	8PCR-06	2.70
3PCR-07	1.82	4PCR-07	2.36	6PCR-07	2.71	8PCR-07	3.13
3PCR-08	2.07	4PCR-08	2.68	6PCR-08	3.08	8PCR-08	3.57
3PCR-09	2.32	4PCR-09	3.01	6PCR-09	3.46	8PCR-09	4.01
3PCR-10	2.57	4PCR-10	3.33	6PCR-10	3.83	8PCR-10	4.45
3PCR .250" C-C H .50" W .55" 5 Amps, 150V Avail. to 32 Positions		4PCR .325" C-C H .50" W .60" 20 Amps, 150V Avail. to 30 Positions		6PCR .575" C-C H .60" W .70" 25 Amps, 300V Avail. to 28 Positions		8PCR .4375" C-C H .70" W .80" 25 Amps, 300V Avail. to 26 Positions	

2S SERIES CAM ACTION

NEW



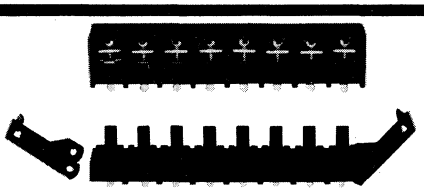
connects stripped wire with finger pressure only

- Solder-in (2SV) or depluggable (2SDV) versions
- 2-16 positions
- Handles 16 str., 18-24 AWG solid or stranded
- Rating 10A, 300V; UL recognized

AMERICAN DESIGNED AND MADE

RDI Cat. No. (Partial)	RDI Cat. No. (Partial)	Center to Center Length	
		inches	mm
2SV-02	2SDV-02	0.2	5,1
2SV-04	2SDV-04	0.6	15,2
2SV-06	2SDV-06	1.0	25,4
2SV-10	2SDV-10	1.8	45,7
2SV-12	2SDV-12	2.2	55,9
2SV-16	2SDV-16	3.0	76,2

NEW



AMERICAN DESIGNED AND MADE

TRI-BARRIER *DEPLUGGABLE*

Terminal Blocks in #4 & #6 Series

Features:

- Positive positioning and latching
- Fast, efficient P.C. board replacement
- Optional latching retainers for extra strain relief
- No special tools required
- Center spacing:
  #4 Series .325" (8.3)
  #6 Series .375" (9.5)

Rating:

#4 Series 20A, 150V
#6 Series 25A, 300V

These depluggables retain all the dependability and features of RDI's traditional No. 4 & 6 Series, yet provide P.C.B. changeout in a fraction of the time needed for rewiring. They take no more real estate, yet provide contact integrity & secure mounting for most applications.

AUGAT RDI / Reed Devices Inc.

Quality and Innovation

Manufacturers of
- SNAPTRACK™ Relay & Timer Socket Assemblies
- Barrier Terminal Blocks
- Proximity Switches
- Custom Circuits

525 Randy Road, Carol Stream, Illinois 60188 (312) 682-4100 TWX 910-252-2118

Beau® Barrier Terminal Strips

CONSIDER THE ADVANTAGES OF BEAU THERMOPLASTIC STRIPS

Beau thermoplastic strips offer many significant advantages. The strong, resilient barriers. The quality and uniformity of the product. Our determined commitment to engineering excellence. And, with our large selection, you're sure to find the strip you need. Design in or cross over to Beau thermoplastic strips—the advantage is yours.

BEND BARRIERS WITHOUT BREAKING

Resilient thermoplastic reduces breakage dramatically. Production line and in-field damage are virtually eliminated.

TERMINAL TAILS ENCLOSED

Cavities are eliminated around solder terminal tails. Allows mounting on PCB without affecting circuit isolation. Eliminates entrapment of foreign matter. Reduces solder wicking.

CLOSED-SIDE STRIPS OFFER EXTRA PROTECTION

Closed side serves as a wire stop. Permits mounting components close to strip without shorting. Wires or screwdrivers can't pass through closed side to contact other wires, leads or PCB components.

HIGHEST U.L. RATING

Our thermoplastic materials all carry the highest U.L. flame retardant rating: UL 94V-0 (self-extinguishing).

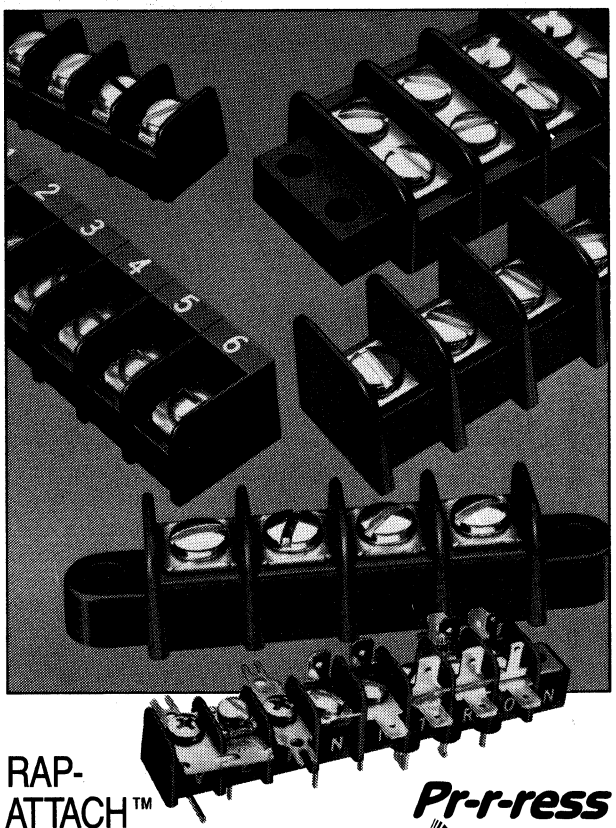
NEAT, ACCURATE MOUNTING ENDS

All our thermoplastic strips are molded to length. None are cut down from longer strips. They're neater, without ugly saw cuts. And they are precisely the same length every time.

WIDE VARIETY OF TERMINALS

There is a broad selection of top-side and bottom terminals—including quick-connect terminals which speed assembly time, cut costs and improve connections.

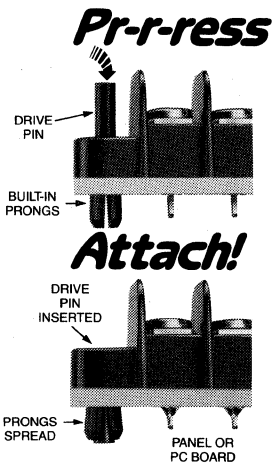
U.L. RECOGNIZED. CSA CERTIFIED.



RAP-ATTACH™ MOUNTS SAVE 40% OF INSTALLED COST

Rap-Attach mounts (option) are the rapid new way to attach barrier terminal strips to PCBs or panels. Just press in the drive pins. The built-in prongs spread like a blind rivet. It's so easy, you can cut installed cost dramatically.

Non-conductive mounting.
Strain-free joints.
Wave solderable.



	SINGLE-ROW						SINGLE-ROW, CLOSED SIDE			DOUBLE-ROW		
Series No.	61000	70000	71000	72000	73000	74000	60000	69000	75000	76000	77000	78000
Terminal ctrs	¼"	.325"	⅜"	⅜"	7/16"	7/16"	¼"	.325"	⅜"	⅜"	⅜"	7/16"
Current (UL)	10A	20A	20A	20A	20A	20A	10A	20A	20A	20A	20A	20A
Volts rms (UL) Gen Indl	150	150	150	150	300	300	150	150	150	150	150	300
Comml	250	250	250	250	250	250	250	250	250	250	250	250
Width	.55"	.50"	.63"	.63"	.75"	.63"	.55"	.60"	.68"	.88"	.88"	1.13"
Height	.50"	.50"	.56"	.66"	.75"	.58"	.50"	.50"	.56"	.63"	.44"	.55"
No. circuits	1-32	1-30	1-26	1-26	1-30	1-30	1-32	1-30	1-26	2-30	2-30	1-30
Back types	Feed thru; closed						Feed thru; closed			Feed thru; closed		

VERNITRON CORPORATION
BEAU PRODUCTS DIVISION
Dept. A5-5, Box 10, Laconia, New Hampshire 03247
TWX: 710-364-1843 FAX: 603-524-1627
For immediate action, call:
(603) 524-5101

Beau® Barrier Terminal Strips

VERSATILE PHENOLIC STRIPS CROSS WITH THE POPULAR SIZES.

Vernitron offers one of the widest lines of phenolic barrier terminal strips available anywhere—and we have a wide variety of options to go with them. We have all the most popular sizes and styles. Compare our quality, price and lead times—we think you'll cross over to Beau.

SINGLE-ROW STRIPS IN MANY STYLES

Series 12000 and 13000 have high-impact glass-filled phenolic bases for excellent breakage resistance; color, green. The other single-row series are made of general-purpose phenolic; color, black. All styles are available with a wide choice of terminals, marker/insulation strips, imprinting, with or without mounting ends, and many other options.

DOUBLE-ROW STRIPS RANGE FROM 10 TO 50 AMPS

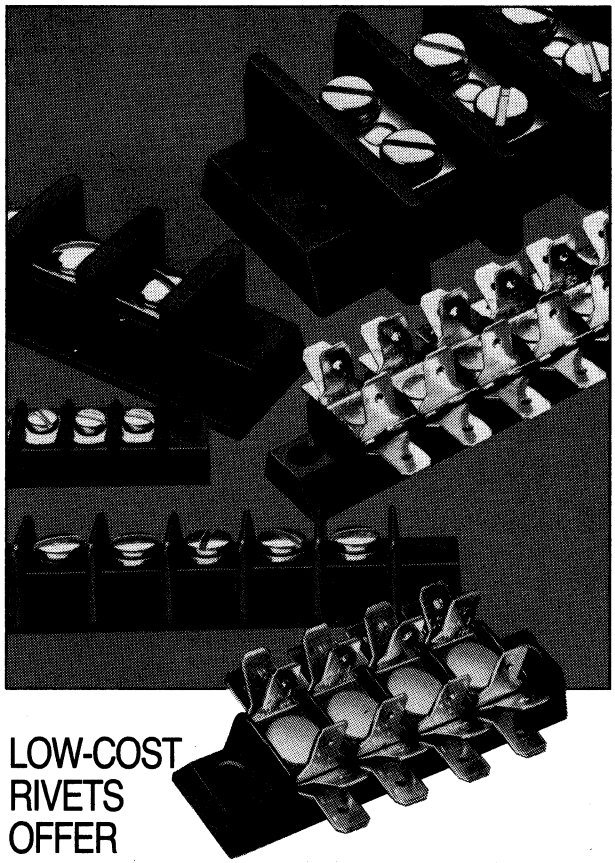
Available in general-purpose phenolic; color, black. Wide choice of terminal styles, marker/insulation strips, imprinting, with or without mounting ends, and many other options.

WIDE VARIETY OF TERMINALS

There is a broad selection of top-side and bottom terminals —including quick-connect terminals which speed assembly time, cut costs and improve connections.

OUR HIGHEST CURRENT STRIP

Series 28000 is rated at 50 A. It's our highest current strip. Series 28000 is a direct cross with series 603.



LOW-COST RIVETS OFFER GREATER SECURITY

Four series of single-row strips come with either screw or rivet (option) construction. Low-cost rivets are vibration resistant and offer greater in-field security. These strips are exact replacements for the styles shown in the table below.

Beau Series	23000	24000	25000	26000
Replaces	411,511	599, 799	699, 899	812, 912

U.L. RECOGNIZED.
CSA CERTIFIED.

AVAILABLE WORLDWIDE through agents in Canada, England, Europe, Japan, Taiwan, and other Far Eastern countries.

	SINGLE-ROW		SINGLE-ROW, SCREWS OR RIVETS				DOUBLE-ROW						
Series No.	12000	13000	23000	24000	25000	26000	10000	14000	18000	19000	21000	22000	28000
Terminal ctrs	3/8"	7/16"	1/4"	3/8"	7/16"	9/16"	1/4"	3/8"	7/16"	7/16"	9/16"	9/16"	11/16"
Current (UL)	15A	20A	10A	15A	20A	30A	10A	15A	20A	20A	30A	30A	50A
Volts rms (UL)													
Gen Indl	150	150	150	150	150	150	150	150	300	300	600	600	150
Comml	250	250	250	250	250	250	250	250	250	250	600	600	250
Width	.57"	.73"	.41"	.56"	.69"	.75"	.63"	.88"	1.13"	1.13"	1.31"	1.31"	1.81"
Height	.44"	.55"	.31"	.41"	.50"	.72"	.31"	.41"	.50"	.55"	.63"	.66"	.75"
No. circuits	1-31	1-26	1-22	1-30	1-30	1-18	1-20	1-30	1-30	1-30	1-25	1-26	1-12
Back types	Feed thru; closed		Open				Open			Closed	Open	Closed	Open

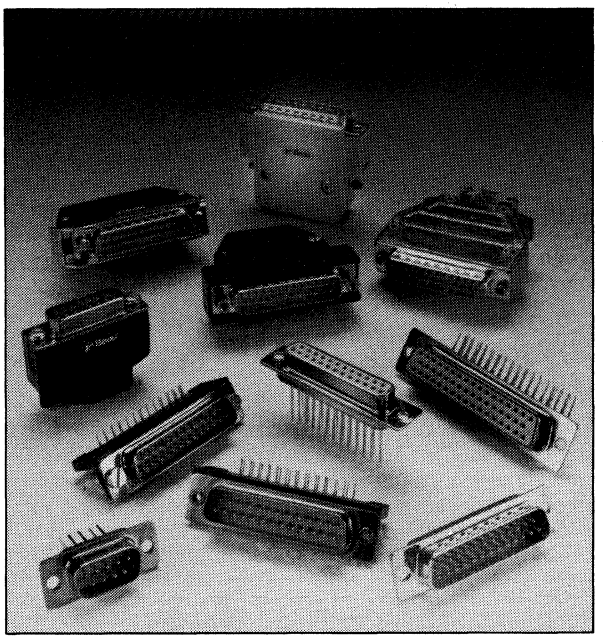
VERNITRON CORPORATION

BEAU PRODUCTS DIVISION
Dept. A5-5, Box 10, Laconia, New Hampshire 03247
TWX: 710-364-1843 FAX: 603-524-1627

For immediate action, call:
(603) 524-5101

Beau® Interconnection Components

CHOOSE FROM A FULL LINE OF D-SUBMINIATURE CONNECTORS



Vernitron offers you a full line of high quality, highly reliable Beau D-subminiature connectors, including the new Theta-D series designed especially for PCBs.

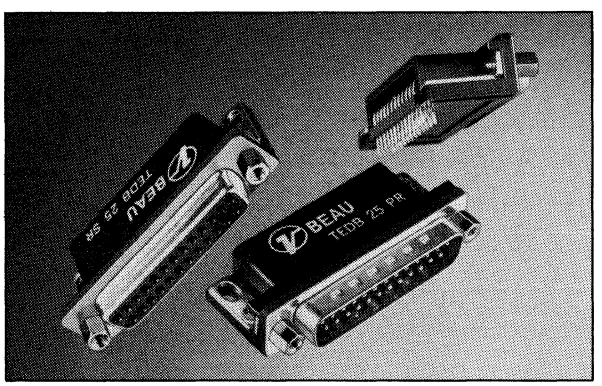
Beau D-subminiature connectors are fully compatible with all industry-standard D-subminiature connectors, and are competitively priced. You can choose from our broad line of high-quality machined-contact styles and more economical connectors with machined or stamped contacts. There are flat cable connectors, PC board connectors with a variety of setback options, and much more.

Theta-D: New, low-cost, plastic D-subs for PCBs.

The new, right-angle mounted Theta-D series of D-subminiature connectors is highly reliable, and the pricing is especially attractive. The one-piece design eliminates the need for separate right-angle mounting brackets and the cost of assembly.

Designed specifically for PC board applications, they have an all-plastic housing and metal shell design, and are fully compatible with all D-subminiature connectors.

Setback configurations are .590", in addition to the European .318" style. Several mounting options and grounding arrangements are available.

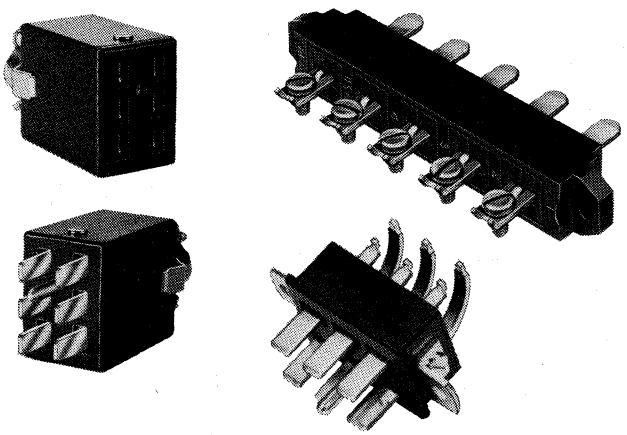


A wide variety of options.

With our broad selection of accessories and options, you're sure to find just what you're looking for. Choose from a variety of contact styles, backshells, and hardware. Choices include locking devices, metal and plastic backshells, right-angle mounting brackets, and cable-clamping options.

PLUG & SOCKET CONNECTORS

From 10 to 60 Amp ratings, Beau connectors offer a number of significant advantages. Differences like standard pregrounding connectors. Rugged, durable blade contacts. Uniform-float contacts that make mating and unmating smooth and sure. Double-wipe contacts. Available in panel and cable-mounting styles.



SERIES	AMPS	CONTACTS
3300	10	2-33
5400	15	4-16
5500	40,45,60	2-16
5600	40,45,60	1-5

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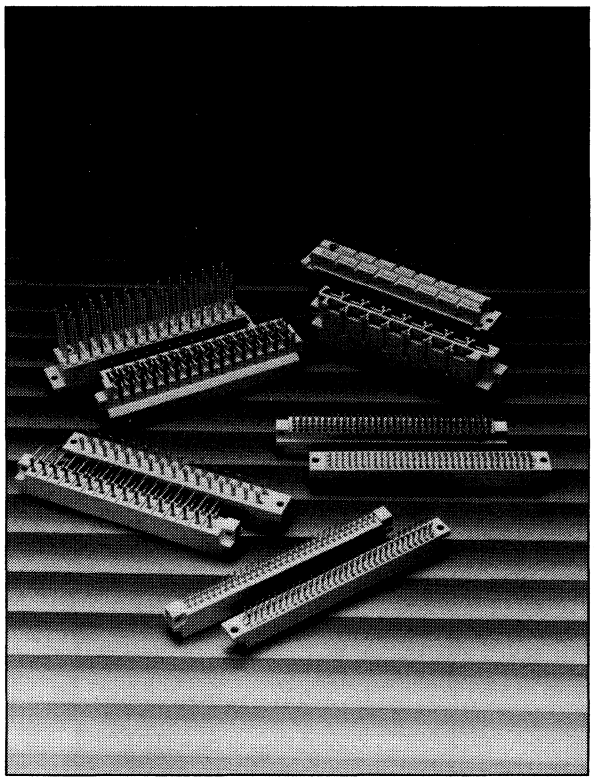
Beau® Interconnection Components

DIN 41612 PC CONNECTORS: MORE CONNECTIONS IN LESS SPACE, FOR LESS MONEY



Vernitron offers DIN 41612 printed circuit connectors that give you economical and highly reliable pin and socket connections to PC boards.

The DIN 41612 connectors also provide much higher contact density than edgeboard PC connectors, while eliminating problems with PC board warpage or variations in thickness. The price per circuit for the DIN connectors is comparable to edgeboard versions, and the amount of gold required on the PC board is greatly reduced.

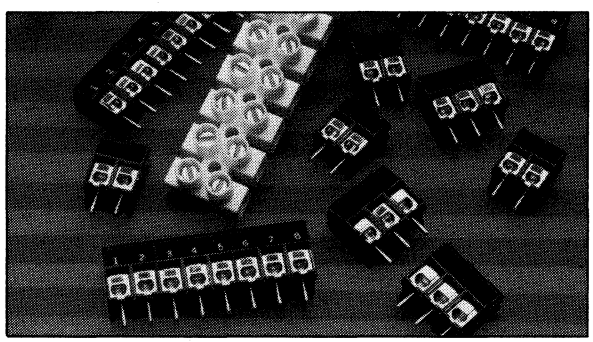
The DIN connectors consist of types B, C, R, D, F, and H, as well as type C connectors for flat cable. They feature contact spacing from .100" to .400", and 11 to 96 contacts, depending on type. All types conform to MIL, DIN, and IEC standards.

New, low-cost contacts.

Types B and C contacts are available with a new bifurcated cantilever option that offers lower cost and lower insertion and withdrawal forces. Tuning fork contact styles are standard.

You can choose from three quality classes of contacts made of copper alloy with hard gold or hard silver-plated finish. Contact tail types include right-angle PC, PC pin, solder lug, wire wrap, wire clamp, and quick-connect.

EUROSTYLE™ TERMINAL STRIPS AND TWO-SCREW TERMINAL STRIPS

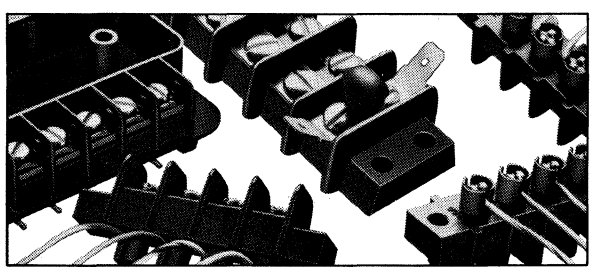


Series 85: These compact, single-row terminal strips are designed especially for PC boards. They can be molded to any length from 2 to 24 positions. Modular in design, they snap together easily while maintaining center-to-center spacing.

The strips have high circuit density (.197" contact spacing), and a very small footprint. Made in USA.

Series C: These two-screw terminal strips also are modular in design. They can be cut into smaller sections with a utility knife, while maintaining center-to-center spacing when installed end to end.

LOW-COST SOLUTIONS TO SPECIAL INTERCONNECTION PROBLEMS



There's almost no limit to the ways we can design cost-saving interconnection devices. By integrating barrier terminal strips with other parts, we can reduce your installed cost. Similarly, blade-type connectors have a wide range of possibilities. We can design for greater electro-mechanical performance, faster assembly, and more. We not only welcome your design problems, we thrive on them.

VERNITRON CORPORATION

BEAU PRODUCTS DIVISION
Dept. A5-5, Box 10, Laconia, New Hampshire 03247
TWX: 710-364-1843 FAX: 603-524-1627

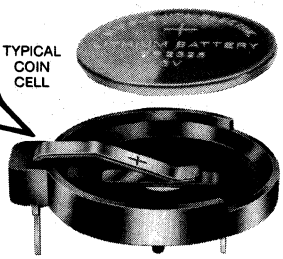
For immediate action, call:
(603) 524-5101

BATTERY HOLDERS

For Lithium, NiCd, Carbon, Carbon-Zinc & Alkaline Cells.

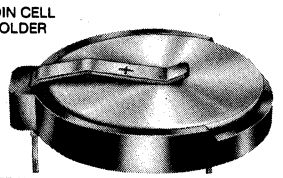
NEW POSITIVE CONTACT

TYPICAL COIN CELL

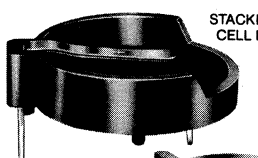


COIN CELL HOLDER

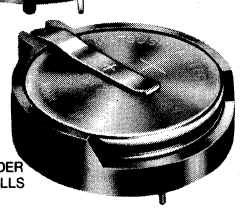
HOLDER WITH COIN CELL



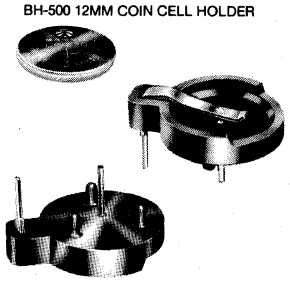
STACKING COIN CELL HOLDER



STACKING HOLDER WITH 2 COIN CELLS

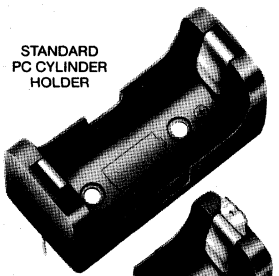


BH-500 12MM COIN CELL HOLDER

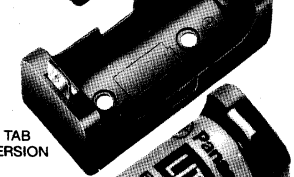


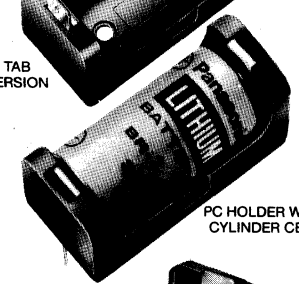
U.S. Patent No. 4,487,820

STANDARD PC CYLINDER HOLDER



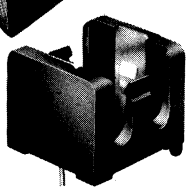
TAB VERSION





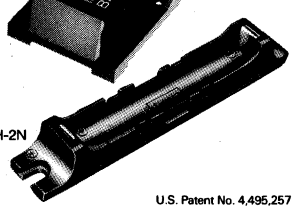
PC HOLDER WITH CYLINDER CELL

BH-1/3N



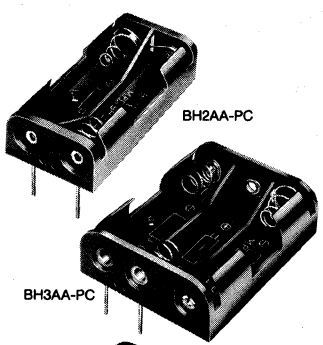
BH-9VPC HOLDER

BH-2N



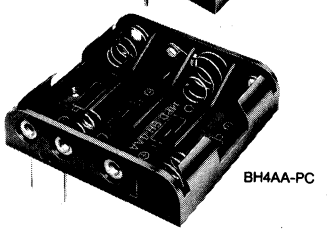
U.S. Patent No. 4,495,257

BH2AA-PC

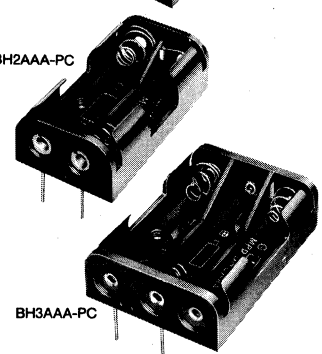


BH3AA-PC

BH4AA-PC

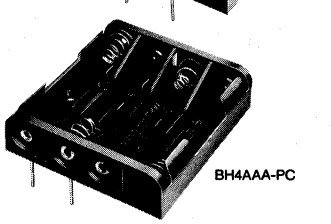


BH2AAA-PC



BH3AAA-PC

BH4AAA-PC



FOR MEMORY BACK-UP SYSTEMS

COIN CELL SERIES

Printed circuit board-mounted lithium coin cell battery holders eliminate the need for permanent solder tab mounting of cells. Unique molded design permits easy insertion and removal of battery without desoldering or special tools. Fits 3-volt coin cells: sizes 12mm, 20mm, 23mm and 24mm. UL flammability rating — UL94V-0.

HORIZONTAL SERIES

Fits 3-volt lithium and other horizontal cells: sizes 2/3A, 1/2AA, AA, C, 2N and 1/3N, 9 volt batteries, too. Simple PC board mounting with fast-on tab terminals for hardware soldering and eyelet mounting. UL flammability rating — UL94V-0.

BATTERY PACK SERIES

Three styles: PC (Printed Circuit), W (Wire), SF (Snap Fastener, male / female terminals). Fits all AA and AAA type cells, 2, 3 and 4 cell capacity. Corrosion-free nickel plated contacts; impact-resistant nylon #6, UL flammability rating — UL94V-2.

CUSTOM BATTERY HOLDERS AVAILABLE ON REQUEST

MPD

BOGEN®
COMMUNICATIONS, INC.
MPD is a product of Bogen Communications, Inc.

50 Spring Street, Ramsey, NJ 07446 • 201-934-8500 • FAX: 201-934-9832 • TWX: 7109905047

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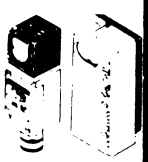
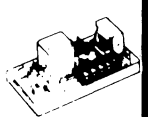
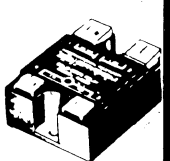
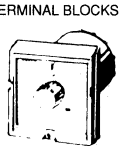

PHOTOELECTRICS

RELAYS


LIQUID LEVEL CONTROLS


SOLID STATE RELAYS

TERMINAL BLOCKS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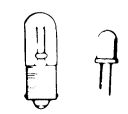
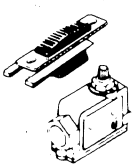
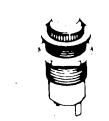

LAMPS & LEDS


SWITCHES

RELAYS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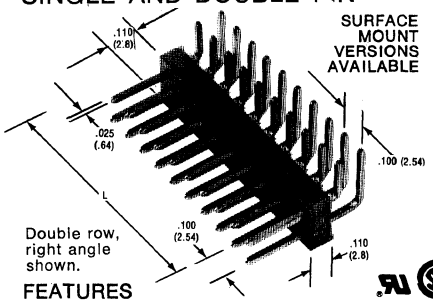
INSULATION DISPLACEMENT CONNECTORS

HEADERS

UNPROTECTED (PIN STRIPS) SINGLE AND DOUBLE PIN



FEATURES

- Drawn pins provide smooth non-abrasive surfaces
- Straight and right angle solder terminals
- Compatible with other leading manufacturers
- Mates with any .100″ (2.54 mm) grid socket
- End-to-end butting without grid loss

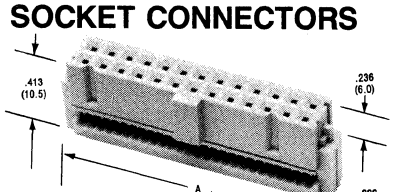
ELECTRICAL SPECIFICATIONS

Current Rating:	5 A
Contact Resistance:	≤ 4 mΩ pin/socket
Insulation Resistance:	> 5 GΩ
Proof voltage:	1500 V
Humidity Resistance:	MIL-C-21097 B DIN 40040

MECHANICAL SPECIFICATIONS

Insulation Material:	Polyamid
Pins:	Springhard copper alloy
Contact Plating:	50 μ inch nickel all over, contact area, 15 μ inch gold acc. to MIL-G-45204 class 0 solder tail tin
Terminations:	Solder pins
Temperature Rating:	−65°C to +105°C

SOCKET CONNECTORS



FEATURES

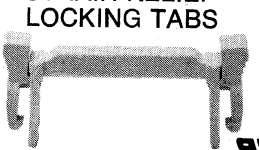
- Designed according to MIL-C-83503
- With or without center key
- Compatible with other leading manufacturers
- Mates with header pins .025″ or .031″
- Feedthrough covers permit chain interconnections
- Available with or without strain relief
- Dual polarization

MATERIALS & FINISHES

Moldings:	Glass-filled polyester. UL flammability rating 94 V-O
Contacts:	Be Cu
Contact Plating:	50 μ inch (1.25 μ m) nickel all over. 20 μ inch (0.5 μ m) gold at plug area - others flash gold or IDC-part tin.

# of Pos.	A inch	A mm
10	.681	17.3
14	.882	22.4
16	.980	24.9
20	1.181	30.0
26	1.480	37.6
34	1.882	47.8
40	2.181	55.4
50	2.681	68.1
60	3.181	80.8
64	3.380	85.9

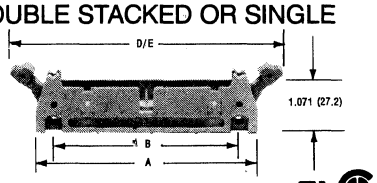
STRAIN RELIEF LOCKING TABS



- Provides secure locking of sockets into low profile headers
- Short travel of locking tabs permits dense board layouts
- Locking tabs also serve as removal tabs

HEADERS

PROTECTED HEADERS DOUBLE STACKED OR SINGLE

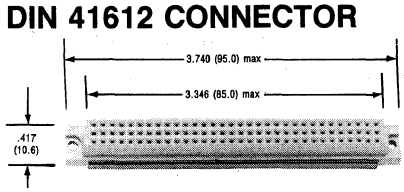


FEATURES

- Designed according to MIL-C-83503
- Straight and right angle flow solder terminals
- Positive locking/ejection latches
- Shielded on all four sides for polarization and contact protection
- Polarizing keys for correct socket alignment without contact loss
- Deep stand-off pads prevent trapping of flux or solvent between header and PCB
- Compatible with other leading manufacturers
- Wire wrappable posts available
- Drawn pins provide smooth non-abrasive surfaces

# of Pos.	Dimensions A	B	D	E
10	1.260 (32.0)	0.858 (21.8)	1.890 (48.0)	2.047 (52.0)
14	1.460 (37.1)	1.063 (27.0)	2.090 (53.1)	2.248 (57.1)
16	1.559 (39.6)	1.165 (29.6)	2.189 (55.6)	2.346 (59.6)
20	1.760 (44.7)	1.358 (34.5)	2.390 (60.7)	2.547 (64.7)
26	2.059 (52.3)	1.661 (42.2)	2.689 (68.3)	2.846 (72.3)
34	2.461 (62.5)	2.063 (52.4)	3.091 (78.5)	3.248 (82.5)
40	2.760 (70.1)	2.362 (60.0)	3.390 (86.1)	3.547 (90.1)
50	3.260 (82.8)	2.862 (72.7)	3.890 (98.8)	4.047 (102.8)
60	3.760 (95.5)	3.360 (85.3)	4.390 (111.5)	4.457 (115.5)
64	3.959(100.6)	3.560 (90.4)	4.589 (116.6)	4.746 (120.5)

DIN 41612 CONNECTOR



FEATURES

- 4 point conductor to connector contact
- Twin cantilever socket contact
- Designed to mate with 96 position DIN 41612 Type C male connectors with contacts in rows a + c only
- Feedthrough covers permit chain interconnection
- Available with or without strain relief
- Contact alignment plate prevents damage to terminations by limiting pin insertion depth
- Compatible with other leading manufacturers

ELECTRICAL SPECIFICATIONS

Current Rating at 25°C:	1.0 A max. per contact with 30 AWG and 28 AWG conductors 1.5 A max. per contact with 26 AWG conductors
Proof Voltage (Sea Level):	1000 V DC or AC peak.
Insulation Resistance:	>5.0 Gohms
Contact Resistance:	8.0 mohms max.

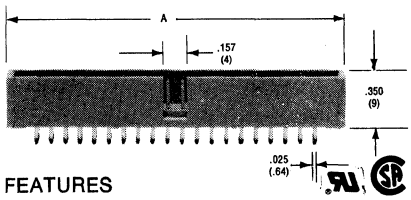
MATERIALS & FINISHES

Moldings:	Glass-filled polyester. UL flammability rating 94 V-O
Contacts:	Copper based alloy
Contact Plating:	Socket: 50 μ inch (1.25 μ m) nickel all over. 20 μ inch (0.50 μ m) gold at plug area - others flash gold or IDC-part tin.

HEADERS

LOW PROFILE

SURFACE MOUNT VERSIONS AVAILABLE



FEATURES

- Drawn pins provide smooth non-abrasive surfaces
- Straight and right angle solder terminals
- Shielded on all four sides for polarization and contact protection
- Deep stand-off pads prevent trapping of flux or solvent between header and PCB
- Compatible with other leading manufacturers

MATERIALS & FINISHES

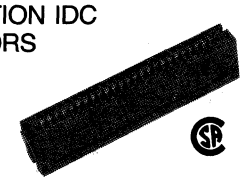
Moldings:	Glass-filled polyester. UL flammability rating 94 V-O
Contacts:	Copper based alloy
Contact Plating:	50 μ inch (1.25 μ m) nickel all over. 15 μ inch (0.375 μ m) gold at plug area - others flash gold or solder parts
Polarizing Keys:	tin. Glass-filled polyester

# of Pos.	A inch	A mm
10	.8	20.3
14	1.0	25.4
16	1.1	27.9
20	1.3	33.0

# of Pos.	A inch	A mm
26	1.6	40.6
34	2.0	50.8
40	2.3	58.4
50	2.8	71.1

CARD EDGE

10-60 POSITION IDC CONNECTORS



FEATURES

- Directly accepts 0.05″ (1.27mm) cable
- Accepts standard industry cable sizes
- Molded alignment grooves for accurately locating cable during assembly
- Pre-loaded spring contacts maintain contact forces on PC boards .002″ (.054mm) to .003″ (.071mm) thick
- Strain relief optional for most sizes
- Bifurcated contacts

ELECTRICAL SPECIFICATIONS

Working Voltage:	230 V AC RMS, 330 V DC
Current Rating at 25°C:	1.0 A Max.
Dielectric Withstanding Voltage (Sea Level):	500 V AC, RMS
Insulation Resistance:	>5.0 Gohms
Contact Resistance:	<30 mohms

MATERALS & FINISHES

Contacts:	Glass-filled polester. UL flammability rating 94V-0
Contact Plating:	Beryllium Copper
Moldings:	Tin alloy IDC tines, 30 μ inch (0.75 μ m) gold at board contact area, over 50 μ inch (0.75 μ m) nickel

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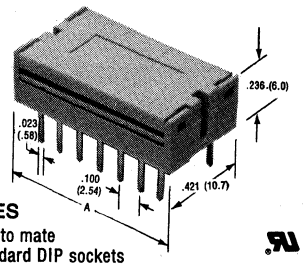
INSULATION DISPLACEMENT CONNECTORS

DUAL IN-LINE PRODUCTS

DIP PLUGS & SOCKETS



FEATURES
- Designed to mate with standard DIP sockets
- Feedthrough covers permit chain interconnections
- Compatible with other leading manufacturers
- Available with or without strain relief/locking latch which also polarizes the connector
- Matching socket and header

MATERIALS & FINISHES

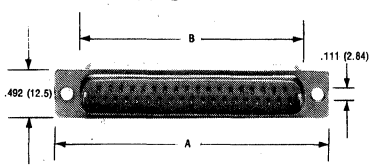
Molding: Glass-filled polyester. UL flammability rating 94 V-O
Contacts: Copper based alloy
Contact Plating: 50 μ inch (1.25 μ m) nickel all over. 150 μ inch (4.0 μ m) tin/lead.

# of Pos.	A inch	A mm
10	.567	14.4
14	.768	19.5
16	.870	22.1

NOTE: Consult factory for additional sizes.

"D" SUBMINIATURE

9-37 POSITION IDC CONNECTORS



FEATURES
- Accepts directly 0.05" (1.27 mm) pitch cable
- Feedthrough covers permit chain interconnection
- Metal shell protection at mating interface
- Available with or without strain relief
- Male and female connectors
- Compatible with other leading manufacturers
- Mating interface dimensions as IEC 48 B-106 and MIL-C-24308 where applicable
- Low profile
- Full cover plastic strain relief optional

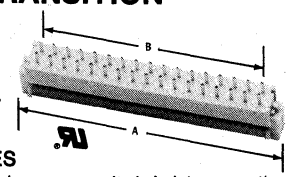
MATERIALS & FINISHES

Moldings: Glass-filled polyester. UL flammability rating 94 V-O
Contacts: Be Cu
Contact Plating: 50 μ inch (1.25 μ m) nickel all over. 2 μ inch (0.5 μ m) gold at plug area - others flash gold or IDC-parf tin.
Shells: Steel, tin-plated. Yellow chromate or zinc yellow optional Dimpled shell on male optional.

# of Pos.	A Inch	A mm	B inch	B mm
9	1.212	30.8	0.646	16.4
15	1.539	39.10	0.970	24.70
25	2.090	53.10	1.515	38.50
37	2.736	69.50	2.161	54.90

PCB TRANSITION

2 ROW



FEATURES
- Feedthrough covers permit chain interconnections
- Available with or without strain relief
- Compatible with other leading manufacturers
- Low profile and size for high density packaging
- .100 inches standard grid

MATERIALS & FINISHES

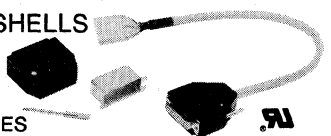
Molding: Glass-filled polyester. UL flammability rating 94 V-O
Contacts: Copper based alloy
Contact Plating: 150 μ inch tin/over 50 μ inch nickel

# of Pos.	Dimensions A	Dimensions B
10	.681 (17.3)	.400 (10.16)
14	.882 (22.4)	.600 (15.24)
16	.980 (24.9)	.700 (17.78)
20	1.18 (30.0)	.900 (22.86)

# of Pos.	Dimensions A	Dimensions B
26	1.48 (37.6)	1.200 (30.48)
34	1.882 (47.8)	1.600 (40.65)
40	2.181 (55.4)	1.900 (48.26)
50	2.681 (68.1)	2.400 (60.96)
60	2.619 (66.52)	2.900 (73.66)
64	2.900 (73.66)	3.100 (78.74)

"D" SUBMINIATURE

BACKSHELLS



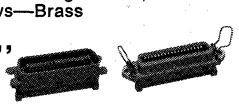
FEATURES

Plastic Shell with Metal Insert
- For round or flat cable
- Separate inner drawn can for optional shielding
- Satisfies requirements of FCC
- Embossed outer shell for non-slip grip
- Accepts new "round and flat" cables
- UL flammability rating 94 V-0

SPECIFICATIONS

Shells: High impact molded plastic, metal finish
Inner Can: One-piece drawn steel
Hardware: 4/40 threaded, cadmium plated locking screws, Jack Screws—Brass

RIBBON "D"



FEATURES
- "Centronics"-type connector for 28 AWG 0.05" (1.27mm) pitch cable, 36 & 50 pos
- Built-in balelock; Bifurcated contacts
- Strain relief included
- Feedthrough covers permit chain interconnections

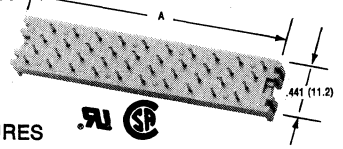
MATERALS & FINISHES

Contacts: Glass-filled polester. UL flammability rating 94V-0
Contact Plating: Beryllium Copper
Moldings: Tin alloy IDC tines, 30 μ inch (0.75 μ m) gold at board contact area, over 50 μ inch (0.75 μ m) nickel

Description	Part Numbers
Male Connector	570-060-053-036/050
Female Connector with balelock	571-060-035-036/050

PCB TRANSITION

4 ROW



FEATURES
- Feedthrough covers permit chain interconnections
- Available with or without strain relief
- Compatible with other leading manufacturers
- Heavy tin plate for easy soldering

MATERIALS & FINISHES

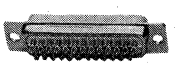
Molding: Glass-filled polyester. UL flammability rating 94 V-O
Contacts: Copper based alloy
Contact Plating: 150 μ inch tin/lead over 50 μ inch nickel

# of Pos.	Dimensions A	Dimensions B
20	1.201 (30.5)	0.950 (24.13)
26	1.500 (38.1)	1.250 (31.75)
34	1.902 (48.3)	1.650 (41.91)

# of Pos.	Dimensions A	Dimensions B
40	2.201 (55.9)	1.950 (49.53)
50	2.701 (68.6)	2.450 (62.23)

"D" SUBMINIATURE

CRIMP/SOLDER CUP/PCB



FEATURES
- Conforms to MIL-C-24308
- Crimp contacts hand or machine terminable, snap into place, removable from rear, fully compatible with AMP. Accepts 20 to 24 AWG wire
- Solder cup accepts up to 20 AWG wire

MATERIALS & FINISHES

Shells: Steel, zinc plated, tin overplate. Male w/ grounding dimples
Moldings: Glass-filled nylon, UL flammability rating 94V-0
Male Contacts: Copper based alloy
Female Contacts: Phospher bronze
Plating: 30 μ-inch (0.75 μ m) nickel flash gold overplate

PCB mount, straight and right angle also available

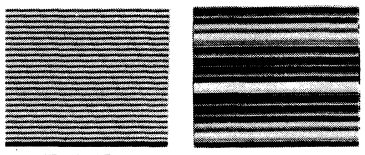
# of Pos.	Gender	Crimp Housing Part Numbers	Solder Cup Part Numbers
9 Shell Size E	Male (Plug)	620-DET-000-009	620-SDR-003-009
	Female (Socket)	621-DET-000-009	621-SDR-003-009
15 Shell Size A	Male (Plug)	620-DAT-000-015	620-SDR-003-015
	Female (Socket)	621-DAT-000-015	621-SDR-003-015
25 Shell Size B	Male (Plug)	620-DBT-000-025	620-SDR-003-025
	Female (Socket)	621-DBT-000-025	621-SDR-003-025
37 Shell Size C	Male (Plug)	620-DCT-000-037	620-SDR-003-037
	Female (Socket)	621-DCT-000-037	621-SDR-003-037
50 Shell Size D	Male (Plug)	621-DDT-000-050	620-SDR-003-050
	Female (Socket)	620-DDT-000-050	621-SDR-003-050
Male Pins	Pack of 100*	620-DRT-100-000	—
	Reel of 10,000	620-DRT-10K-000	—
Female Pins	Pack of 100*	620-DRT-100-000	—
	Reel of 10,000	620-DRT-10K-000	—

* Pack of 100 loose pins

Carrot Components Corporation
750 W. Ventura Blvd. / Camarillo, CA 93010 / (805) 484-0540 / TWX: 910-336-1237 / FAX: (805) 987-5062

INSULATION DISPLACEMENT CONNECTORS

PLANAR IDC CABLE
EXTRUDED GRAY
UL STYLE 2651 (105°C, 300V)
BONDED COLOR
UL STYLE 20029 (105°C, 300V)



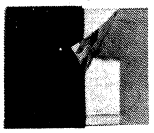
FEATURES
- Easy Termination: To .050" I.D.C. connectors
- Pitch Tolerance: ±.002"
- Polarity Mark: Red Edge
- Profile: Both sides ridged for easy connector termination and cable flexibity
- UL Flammability Rating: VW-1
- 200 ft/reel

2651
- Color: Gray
- S-R PVC type acquired CSA approval

20029
- Easy Circuit Identification: Ten brilliant colors used
- Color Code: Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White, Black (repeat)

Available in 9-64 conductors.

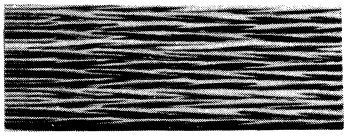
PLANAR IDC CABLE
JACKETED SHIELDED
UL STYLE 2651 (105°C, 300V)



FEATURES
- Jacketed Shield Flat Cable contains a core of Extruded Gray (code: EG-28)
- Easy Termination: To .050" I.D.C. connectors
- Pitch Tolerance: ±.002"
- Color (Jacket): Black
- UL Flammability Rating: VW-1
- EMI/RFI Shielding
- 2 drain wires with tin overcoating for added reliability
- For external/internal equipment usage
- Thin wall jacket UL Style 2912 is available
- 100 ft/reel

Available in 9-64 conductors.

PLANAR IDC CABLE
LAMINATED QUICK TWIST
UL STYLE 20184 (105°C, 300V)



FEATURES
- Easy Termination: To .050" I.D.C. connectors
- Pitch Tolerance: ±.002"
- Easy Circuit Identification: Ten brilliant colors used
- Color Code: Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White, Black (repeat), Tan (common)
- UL Flammability Rating: VW-1
- Low cross talk flat cable
- High stability 0.007" laminate film is used to increase dimensional stability
- 100 ft/reel

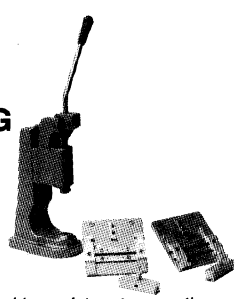
Available in 5-32 pairs.

ELECTRICAL CHARACTERISTICS

Capacitance:	21pF/ft nom.
Characteristic Impedance:	100Ω nom.
Crosstalk:	Near end 3.8%/10ft-far end 1.5%/10ft (10ns rise time pulse)
Propagation Delay:	1.65ns/ft

Carrot now markets G&H Technology BLC/Commercial Cylindrical Series IV ASK FOR CATALOG.

TOOLING



FEATURES
- Three platen and base plate sets cover the complete range of Carrot connectors
- Platens and base plates may be turned through 90° for chain interconnections
- Positive toggle action bench press
- Built-in cable guide and stop ensures correct cable to connector alignment

ORDERING INFORMATION

Description	Part Numbers
Universal bench press	099-100-000-000
Platen & base plate set for: Sockets, DIP Plugs, Transition connectors, DIP Sockets	598-110-001-600
'D' Subminiature connectors	598-110-002-600
DIN 41612 Socket connector	598-110-003-600
Hand press - for small size sockets only	080-000-008-000
Hand press - for all sizes D Subminiature connectors	080-000-016-000
Cable shears	080-001-001-000
Height setting gauge	098-002-029-000

ORDERING INFORMATION

UNPROTECTED HEADERS (PIN STRIPS)
511-AAA-003-0XX
AAA = Style: 020 = Single Row, Straight Pin
280 = Single Row, Rt. Angle Pin
030 = Double Row, Straight Pin
270 = Double Row, Rt. Angle Pin
XX = No. of Pins (10, 14, 16, 20, 26, 34, 50, 60, 64) Single Row Avail. 01 to 30 Double Row Avail. 02 to 60 (2x1, 2x30)

PROTECTED HEADERS
511-BBB-003-0XX
BBB = Style: 060 = Straight Pin, No Latches
061 = Straight Pin, Short Latches
062 = Straight Pin, Long Latches
260 = Rt. Angle Pin, No Latches
261 = Rt. Angle Pin, Short Latches
262 = Rt. Angle Pin, Long Latches
XX = No. of Pins (10, 14, 16, 20, 26, 34, 40, 50, 60, 64)

LOW PROFILE HEADERS
511-C65-003-0XX
C = Pin Style: 065 = Straight Pin
265 = Rt. Angle Pin
XX = No. of Pins (10, 14, 20, 26, 34, 40, 56)

SOCKETS
517-06D-003-0XX
D = Cap. Option
5 = Standard Cap
6 = Strain Relief
XX = No. of Positions (10, 14, 16, 20, 26, 34, 40, 60, 64)

SOCKET STRAIN RELIEF CAP WITH LOCKING TABS FOR USE WITH LOW PROFILE HEADERS
517-063-7XX-923 (10, 14, 16, 20, 26, 34, 40, 50)
XX = No. of Positions
Locking Tabs Only
517-063-101-923

DIP PLUGS
533-060-003-0XX
XX = No. of Positions (10, 14, 16)
Strain Relief for Dip Plugs
533-060-7XX-700
XX = No. of Positions (10, 14, 16)

PCB TRANSITION
2 ROW
533-065-024-0XX
XX = No. of Positions (10, 14, 16, 20, 26, 34, 40, 50, 60, 64)
4 ROW
533-061-024-0XX
XX = No. of Positions (20, 26, 34, 40, 50)
Strain Relief for 4 Row Transition
533-061-7XX-700
XX = No. of Positions (20, 26, 34, 40, 50)

DIN 41612
538-060-003-064
Strain Relief for DIN 41612
538-060-764-711

CARD EDGE
353-060-035-0XX
XX = No. of Positions (10 thru 60)

D-SUBMINIATURE
62E-0FF-035-0XX
E = 0 = Male (Plug)
1 = Female (Socket)
FF = Shell Plating
060 = Zinc Chromate, 9-37 Position (Optional)
061 = Tin, 9-37 Position (Standard)
066 = Tin, with Dimpled Shell, Male Only, 9-37 Position (Standard)
XX = No. of Positions (9, 15, 25, 37)

D-SUBMINIATURE HARDWARE
Plastic Backshell with Hardware
620-05G-9XX-923
G = Cable Configuration
8 = Round Cable
9 = Flat Cable
XX = No. of Positions (25, 50)
Jackscrew for Plastic Backshell
(Set of 2) 408-000-218-232
Metal Shielding Can for Plastic Backshell
620-05H-9XX-724
H = Cable Configuration
XX = No. of Positions (25, 50)

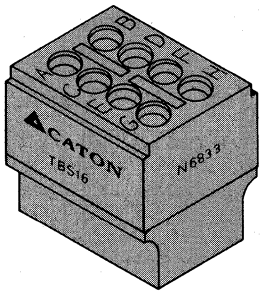
RIBBON D
Male: 570-060-053-036/050
Female: 571-060-035-036/050

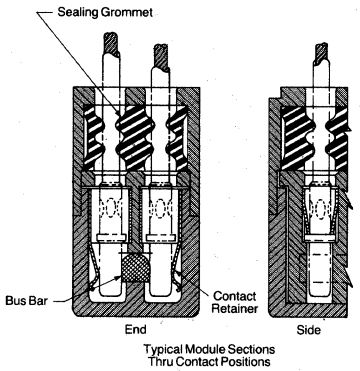
CRIMP/SOLDER CUP
D-Subminiature
See Product Description

FLAT CABLE
Extruded Gray (200 Ft. Rolls)
CEG-287-200-0XX
XX = No. of Conductors (9 through 64)
Bonded Color Coded (200 Ft. Rolls)
CBC-287-200-0XX
XX = No. of Conductors (9 through 64)
Jacketed and Shielded Extruded Gray (100 Ft. Rolls)
CJS-287-100-0XX
XX = No. of Conductors (9 through 64)
Twisted Pairs with Flat (100 Ft. Rolls)
CLQ-287-100-0XX (10 through 64)

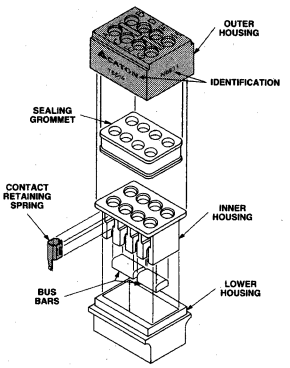
SEALOK®

an Environmentally Sealed Modular Interconnection System





Typical Module Sections Thru Contact Positions



Description

Caton Connector announces **SEALOK**, an environmentally sealed modular interconnection system for shipboard, aircraft, aerospace and many industrial commercial applications where protection against environment is required.

Caton offers in **SEALOK** a compact system that:

- Functions over a wide range of temperature, vibration and shock without variations in contact resistance.
- Protects electrical junctions from humidity and corrosive attack.
- Provides wiring flexibility.
- Can be readily installed and serviced by tools common in industry.

Features

Outer Housing. The outer shell of the **SEALOK** module is constructed in two halves of glass-filled diallyl phthalate, a lightweight thermosetting plastic ***that protects the sealing grommet and other internal components from damage.*** The two halves are bonded in an area where the adhesive will not contaminate contact and locking surfaces.

The hard top of the outer housing:

- Ensures maximum seal effectiveness even if severe training of wires occurs.
- Provides a guide for proper insertion and extraction of contacts.
- Offers a surface for clear identification of contact positions and bussing arrangements.
- Minimizes exposure of sealing gland surfaces to injurious fluids.

Material

Molded Housing:
Glass-filled, thermosetting diallyl phthalate per MIL-M-14F, Type SDG-F. Color green.

Sealing Grommet:
Silicone rubber compound

Contact Retaining Spring:
Beryllium copper per Fed. Spec QQ-C-533

Bus Bar:
Brass per Fed. Spec. QQ-B-626b. Plated .00030 min. hard gold

Sealing Plugs:
Heat-resistant plastic. Color coded

Track:
Extruded aluminum (6063) per Fed. Spec. QQ-A-200/9a

End Clamp:
Die-cast anodized aluminum (A380) per MIL-F-14072, Type II. Color silver gray

Spacer:
Heat-resistant plastic. Color yellow

Hardware:
Stainless steel per MIL-S-7720

Performance Characteristics

Dielectric Withstanding Voltage:
(Sea level) 1500 volts AC minimum
(70,000 ft., wires removed) 275 volts AC minimum
(70,000 ft., wires installed) 1000 volts AC minimum

Maximum Current Rating:

TBS20-__-1	7.5 amperes
TBS1620-__-1	20.0 amperes
TBS 16-__-1	20.0 amperes

Operating Temperature:
−55°C to +150°C

Voltage Drop:
(Measured per MIL-C-26636 across two adjacent wires at max. rated current)

TBS20-__-1	26 millivolts max.
TBS1620-__-1	46 millivolts max.
TBS16-__-1	46 millivolts max.

Insulation Resistance:
5000 megohms min. at 25°C
2000 megohms min. at 200°C

Contact Retention Force:

YTB20-2D45	20 lbs. min.
YTB16-1D45	25 lbs. min.

Humidity:
per MIL-STD-202, Method 106. Insulation resistance 1000 megohms min.

Vibration:
per MIL-STD-202, Method 204. Condition D. No loosening of parts, damage or discontinuity in excess of one microsecond

Durability:
(18 cycles of insertions and withdrawals) Meets all applicable requirements after durability cycling.

High Impact Shock:
per MIL-STD-202, Method 207. No loosening of parts, damage or discontinuity in excess of one microsecond

Fluid Immersion:
(Five Cycles of two-minute immersion and 23-hour wait) **SEALOK** module is unaffected by lubrication oil per MIL-L-9236 or by jet fuel JP-4 per MIL-J-5624

SEALOK™ – Manufactured under license from the Burndy Corporation.

CATON
Caton Connector Corporation
® REG. T.M. of the Burndy Corp.

Jones River Industrial Park • Wapping Road (Route 106)
Kingston, Massachusetts 02364-1333
Telephone: 617-585-4315 • FAX: 617-585-2973

CCM Series

High Voltage Cable Assemblies

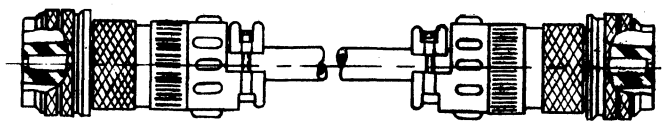
The **CCM Series** is a basic and proven design. Standard quality materials, customization and a twenty year track record make this series ideal for most High Voltage Corona-Free cable assembly requirements.

Pictured here are some typical cable assembly configurations...but not limited to just these, please consult sales rep or CATON directly with your requirements, **1 thru 8 conductors available.**

The **CCM Series** utilizes standard MIL-C-5015 Class E aluminum shells. The inserts are resilient silicone per ZZ-R-765 with tapered self centering contours. When mated all air is excluded thereby making the connection impervious to the outside environment. All shields are circumferentially terminated using a grounding wedge which provides an excellent ground circuit and overall assembly durability.

Factory terminated assemblies have corona inception voltages of 4 KVAC thru 20 KVAC when measured on a corona test set with a minimum sensitivity of 15 picocoulombs.

TYPE



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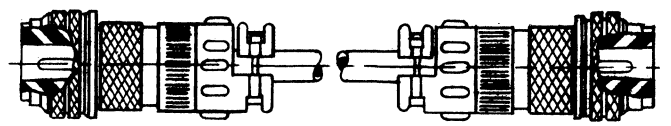

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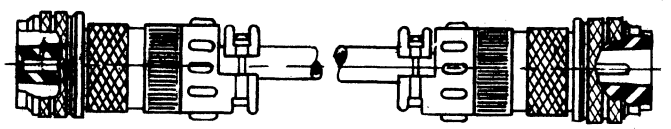

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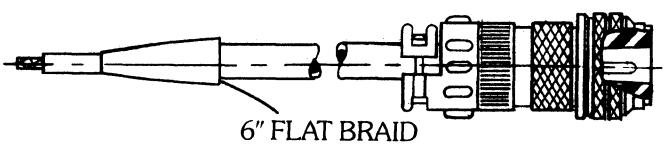

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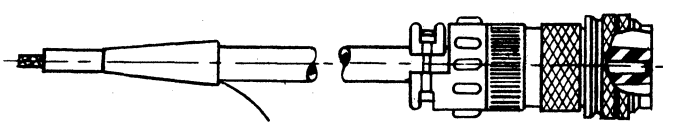

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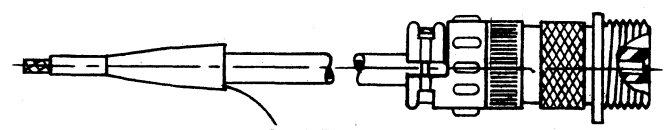

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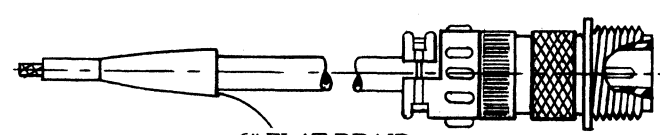

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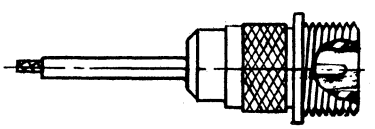

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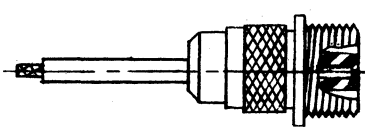
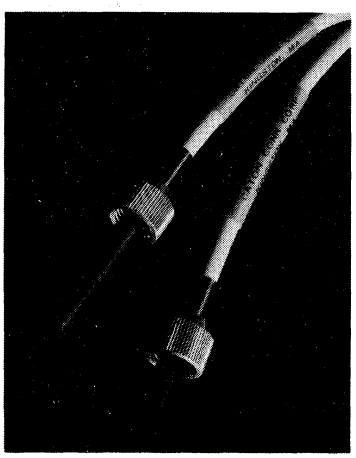


9

CATON
Caton Connector Corporation
Jones River Industrial Park • Wapping Road (Route 106)
Kingston, Massachusetts 02364-1333
Telephone: 617-585-4315 •
FAX: 617-585-2973

LGG Series

High Voltage Lead Connectors



Tripping of sensitive logic circuitry, power loss and eventual failure are the three main problems Corona can cause. The **CATON LGG Series** is designed for Corona-Free performance... 2½ times superior than AMP assemblies.

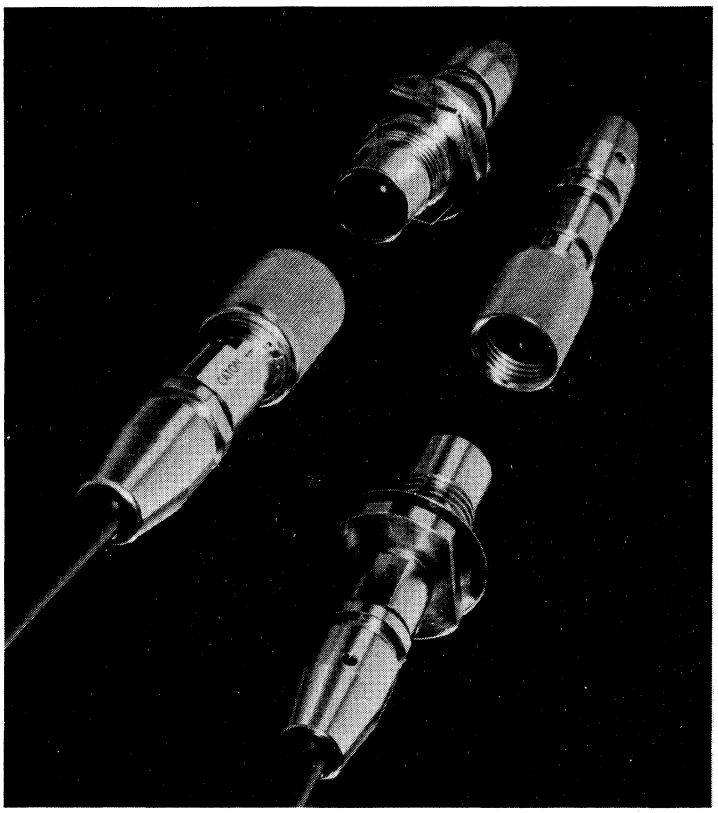
CATON assemblies have corona inception voltages of at least 5KVAC as measured on a corona test set with a minimum sensitivity of 5 picocoulombs.

AMP P/N	CATON P/N	AMP P/N	CATON P/N	AMP P/N	CATON P/N
	S13046-L				
830126-2	S13057-L	862550-4	S13057-L	1-849104-5	S13060-L
830637-5	S13047-L	862550-6	S13057-L	1-849104-6	S13060-L
830638-2	S13059-L	862550-8	S13057-L	1-849616-0	S13061-L
830638-6	S13059-L	862550-9	S13057-L	1-849616-5	S13061-L
830638-9	S13059-L	862551-1	S13047-L	1-861814-5	S13061-L
837655-0	S13056-L	862551-4	S13047-L	1-861814-6	S13061-L
837655-5	S13056-L	862551-6	S13047-L	1-861814-9	S13061-L
837655-7	S13056-L	862551-8	S13047-L	1-862550-3	S13057-L
837701-7	S13056-L	863701-5	S13056-L	1-862551-2	S13047-L
846938-8	S13062-L	863701-8	S13056-L	1-862551-5	S13047-L
849099-4	S13063-L	863702-2	S13057-L	1-863701-0	S13056-L
849099-7	S13063-L	863703-1	S13056-L	1-863701-1	S13056-L
849099-9	S13063-L	863703-4	S13056-L	1-863701-3	S13056-L
849103-1	S13063-L	863703-6	S13056-L	1-863702-2	S13057-L
849103-5	S13063-L	863703-8	S13056-L	1-863702-3	S13057-L
849104-1	S13060-L	863703-9	S13056-L	1-863702-6	S13057-L
849616-7	S13061-L	863705-5	S13047-L	1-863702-7	S13057-L
861811-1	S13063-L	863706-2	S13059-L	1-863705-2	S13047-L
861811-4	S13063-L	863706-6	S13059-L	1-863705-3	S13047-L
861811-5	S13063-L	863706-9	S13059-L	1-863706-5	S13059-L
861812-1	S13060-L	863707-1	S13047-L	1-863706-9	S13059-L
861812-2	S13060-L	863707-4	S13047-L	1-863707-2	S13047-L
861812-3	S13060-L	863707-6	S13047-L	1-863707-5	S13047-L
861812-4	S13060-L	863707-8	S13047-L	2-830126-1	S13057-L
861813-1	S13062-L	1-830126-2	S13057-L	2-830637-1	S13047-L
861813-2	S13062-L	1-830126-3	S13057-L	2-830637-4	S13047-L
861813-6	S13062-L	1-830126-6	S13057-L	2-830637-8	S13047-L
861814-1	S13061-L	1-830126-7	S13057-L	2-830638-0	S13059-L
862444-3	S13048-L	1-830637-2	S13047-L	2-846930-0	S13062-L
862484-4	S13048-L	1-830637-3	S13047-L	2-846938-0	S13062-L
862484-7	S13048-L	1-830638-5	S13059-L	2-849616-2	S13061-L
862484-8	S13048-L	1-830638-9	S13059-L	2-861814-1	S13061-L
862549-1	S13056-L	1-837655-0	S13056-L	2-863637-8	S13047-L
862549-4	S13056-L	1-837655-1	S13056-L	2-863702-1	S13057-L
862549-6	S13056-L	1-837655-3	S13056-L	2-863705-1	S13047-L
862549-8	S13056-L	1-846938-6	S13062-L	2-863705-4	S13047-L
862549-9	S13056-L	1-849099-2	S13063-L	2-863705-8	S13047-L
862550-1	S13057-L	1-849103-9	S13063-L	2-863706-0	S13059-L

Jones River Industrial Park • Wapping Road
(Route 106) • Kingston, Massachusetts 02364-1333
Telephone: 617-585-4315 • FAX: 617-585-2973

CATON
Caton Connector Corporation

KAM Series
High Voltage Cable Assemblies



KAM Series

The KAM Series are high quality, high voltage, corona-free connectors which are designed for use with RG-214 coaxial cable.

General Specifications and Capabilities

Connectors are designed for use with RG-214 Coaxial Cable (13 AWG .425 jacket O.D.)

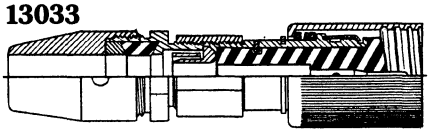
MECHANICAL: Shell and Basic Hardware: 1/2 Hard Brass per QQ-B-626 Alloy 360 Nickel Plate per QQ-N-290, Class 2 Type VI, Over Copper Flash per MIL-C-14550, Class 4

MOUNTING HARDWARE: 1/2 Hard Brass per QQ-B-626 Alloy 360 Nickel Plate per QQ-N-290, Class 2 Type VI, Over Copper Flash per MIL-C-14550, Class 4.

ELECTRICAL: (When properly assembled and mated)
Operating Voltage: 6.6 KVRMS
Dielectric Withstanding Voltage: 10 KVRMS
Current: 20 Amps
Corona Extinction Voltage: 5.3 KVRMS

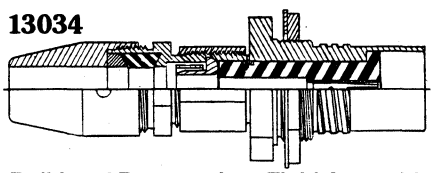
ENVIRONMENTAL: (When properly assembled and mated)
Operating Temperature: 0 to +125°C
Altitude: Rated values shall be maintained to an altitude of 10,000 feet.

13033



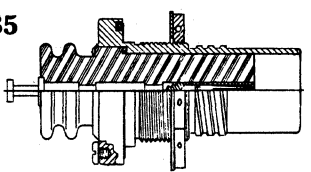
Cable Plug—Field Assembly
Mates with: 13034 and 13035

13034



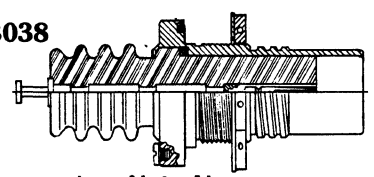
Bulkhead Receptacle—Field Assembly
Mates with: 13033

13035



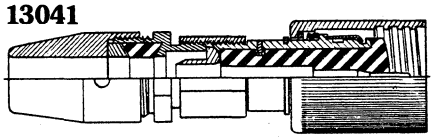
Chassis Receptacle
Mates with: 13033

13038



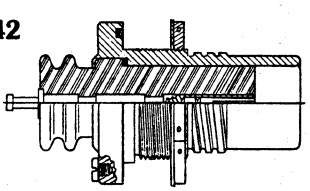
Receptacle—Air to Air
Mates with: 13033

13041



Cable Plug—Field Assembly
Mates with: 13042

13042



Chassis Receptacle
Mates with: 13041

Jones River Industrial Park • Wapping Road
(Route 106) • Kingston, Massachusetts 02364-1333
Telephone: 617-585-4315 • FAX: 617-585-2973

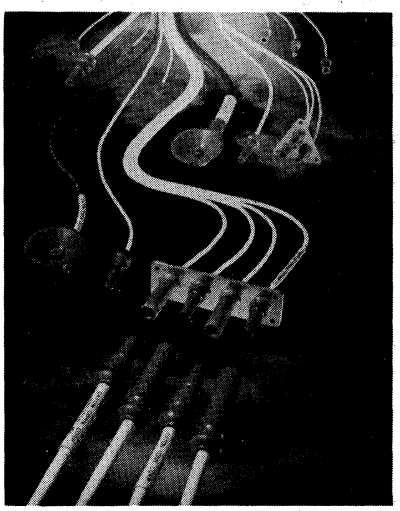
CATON
Caton Connector Corporation

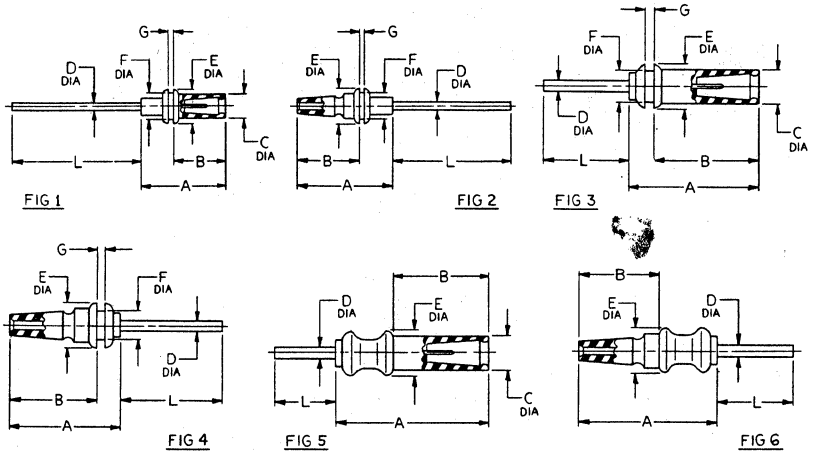
PM 200•300 Series

Silicone In-Line Connectors

Whether the application is a Clean Room test hook up or an oil and water laden harsh environment, the PM Series offers space saving reliable High Voltage, Corona-free performance at costs below conventional shell type connectors.

Air is completely excluded when these connectors are mated thereby making the connection impervious to air, water and most oils. The resilient silicone connector bodies offer quick connect and disconnect while still maintaining pull out force of 10–13 lbs.





Features

- 10-45 KVDC operating voltages
- 7.5-30 amp continuous
- grommet or in-line mounting
- wire directly molded to connector body
- −55° to +125°C
- no degradation to 70,000 feet

Specifications

Connector body: silicone rubber per ZZ-R-765
55 (female)–75 (male) durometer, color red
Female socket contacts: bronze per ASTMB-140, alloy B, gold plated MIL-G-45204
Male contacts: ½ hard brass per QQ-B-611A.
gold plated per MIL-G-45204
Wire: silicone tinned copper stranded, color white per MIL-W-16878/8

CATON P/N	VOLTAGE RATING	FIG	CONTACT SIZE	A	B	C	D	E	F	G	MATING P/N'S
PM105M	10KVDC	1	.040	1.20	.75	.35	.10	.48	.36	.06	PM105F
PM105F	10KVDC	2	.040	1.30	.85	---	.10	.48	.36	.06	PM105M
PM200M	30KVDC	3	.062	1.81	1.47	.47	.14	.62	.43	.12	PM200F PM210F
PM200F	30KVDC	4	.062	1.96	1.22	---	.14	.62	.43	.12	PM200M PM210M
PM210M	30KVDC	5	.062	2.16	1.37	.47	.14	.62	---	---	PM200F PM210F
PM210F	30KVDC	6	.062	1.94	1.12	---	.14	.62	---	---	PM200M PM210M
PM300M	45KVDC	3	.080	2.23	1.87	.49	.30	.78	.53	.12	PM300F PM310F
PM300F	45KVDC	4	.080	1.93	1.60	---	.30	.78	.53	.12	PM300M PM310M
PM310M	45KVDC	5	.080	2.62	1.72	.59	.30	.78	---	---	PM300F PM310F
PM310F	45KVDC	6	.080	2.37	1.47	---	.30	.78	---	---	PM300M PM310M

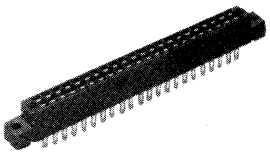
Applications

The PM Series has been used on applications such as land or air-borne radar, photocopy equipment (corona spells trouble in these machines), CRT displays, printing presses, and laboratory hook-ups.

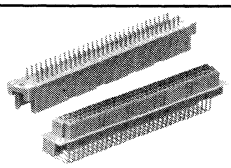
CATON
Caton Connector Corporation
Jones River Industrial Park • Wapping Road
(Route 106) • Kingston, Massachusetts 02364-1333
Telephone: 617-585-4315 • FAX: 617-585-2973

CINCH

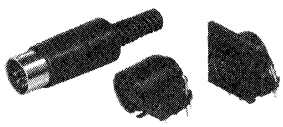
Meet the Broadest Line of Standard Connectors Available From One Source...CINCH Connectors



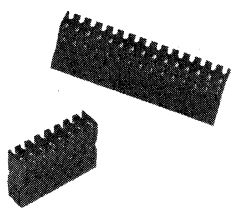
Edge Connectors
Designed to mate with the plated fingers of a PC board.
- .050", .100", and .156" center spacing
- Single and double readout
- Straight and right angle styles



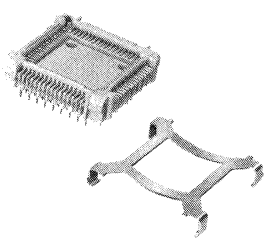
Two-Piece Connectors
For mother/daughter PC board applications requiring high pin counts and vibration protection.
- DIN Eurostyle types



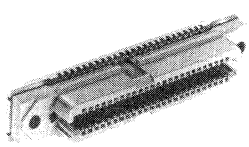
Circular DIN Connectors
For cable-to-PC board applications.
- Low cost
- Meets European DIN standards
- Miniature styles available



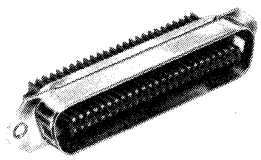
.125" True Grid Connectors
Box contact connectors are fully stackable both end-to-end and side-by-side without losing a mating pin.
- High speed reliable IDC termination
- 22-28 AWG in one contact
- Replace wire-wrap...connectorize your back planes.
- UL and CSA recognized



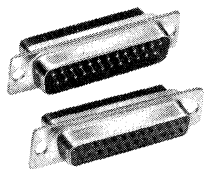
LCC Leadless Chip Carrier Sockets
Designed to effectively use PC board for high pin count packages.
- 68-pin with contact tails on .100" (2.54mm) square grid
- Accepts JEDEC Type A, B, and D leadless ceramic substrates
- High temperature (burn-in) capability



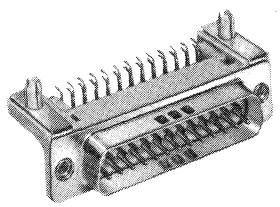
Filter Ribbon Connectors
Capacitive filtered to reduce EMI/RFI radiation enabling designs to meet FCC requirements.
- Wide range of capacitance values
- Available in feed through, dip solder and compliant PC, IDC cable styles
- UL and CSA recognized



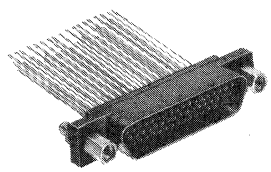
Miniature Ribbon Connectors
Standard connector to datacomm applications.
- Available with plastic or metal shells
- PC board and cable-to-cable types
- Straight and right angle styles
- Filtered pin types available



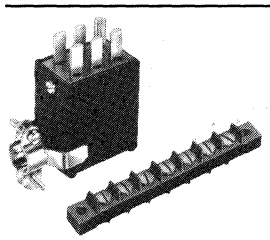
D-Subminiature Connectors
Proven connector for computer and telecom applications.
- PC board and cable-to-cable types
- Metal shell grounded types available
- Available with dip solder, solder cup, crimp and poke, and IDC contacts



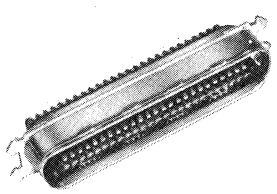
Surface Mount D-Subminiature Connectors
Designed and packaged for high speed automatic assembly.
- Snap-in mounting feet with drive pins
- Suitable for board thicknesses of 0.062-0.125 in.
- UL and CSA recognized



High Density Microminiature Connectors
Designed for extreme environmental applications
- Reliable CINCH patented twist pin contact
- Higher density than standard D-Subminiature shells
- Cable-to-cable and PC board styles



Jones Plugs and Sockets—Barrier Blocks
Used in communications, test equipment, signal systems, vending equipment, and related fields.
- Established as an industry "by word" for more than a generation
- Still the most efficient for light and medium power applications
- Available in a wide variety of sizes and mounting arrangements



SCSI/Centronics
Miniature ribbon plug connectors for overmold cables.
- Full metal shells for maximum shielding
- Tin plating for solderability
- Solder cup or IDC terminations
- UL and CSA recognized

CINCH

Solutions That Connect.

Connector Division
1501 Morse Avenue
Elk Grove Village, Illinois 60007
312.981.6000
FAX: 312.981.6132
Telex: 287433

Cinch Connectors Ltd
Shireoaks Road, Worksop, Notts S80 3HA
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BP 218, 78051 St. Quentin En Yvelines
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Cinch Connectors
Labinal Components & Systems GmbH
Aidenbach Strasse 137a. 8000 Munchen 71
West Germany
Telephone: 089 789053
FAX: 089 7809926
Telex: 17 898848

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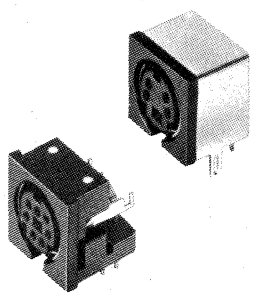
See Cinch Catalog C-100C for complete ordering information.

CINCH

Circular Mini Din Sockets



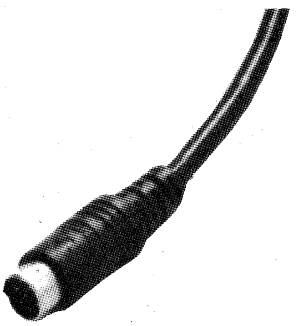
Features

- Contact positions: 3,4,5,6,7, and 8
- Socket mounts to PC board
- Sockets available in shielded and unshielded styles
- Designed for cable-to-PC board interconnections

Ordering Information

Please consult factory for sockets ordering information.

Circular Mini Din Plug Assemblies



Features

- Contact positions 3,4,5,6,7, and 8
- Pre-assembled with standard shielded cable lengths; consult factory for other lengths
- Molded-in strain relief
- Cable and Overmold available in standard colors: black or beige
- Contacts available with Gold over Nickel
- Shielding System designed to meet FCC requirements for EMI/RFI suppression

Ordering Information

For cable assemblies with Plug on one end. Plug features contacts with Option 1 Plating (Gold Flash over Nickel).

No. of Contacts	Cable Length	Black Color Cable and Overmold	Beige Color Cable and Overmold
	Meter	Part Number	Part Number
3	1	MDC-3P05	MDC-3P08
4	1	MDC-4P05	MDC-4P08
4	2	MDC-4P13	MDC-4P53
4	3	MDC-4P15	MDC-4P55
5	1	MDC-5P05	MDC-5P08
6	1	MDC-6P05	MDC-6P08
6	2	MDC-6P13	MDC-6P53
6	3	MDC-6P15	MDC-6P55
7	1	MDC-7P05	MDC-7P08
7	2	MDC-7P13	MDC-7P53
7	3	MDC-7P15	MDC-7P55
8	1	MDC-8P05	MDC-8P08
8	2	MDC-8P13	MDC-8P53
8	3	MDC-8P15	MDC-8P55

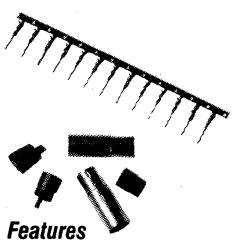
The above cable assemblies are highly recommended for general commercial applications. Contact factory for other lengths or colors.

For cable assemblies with Plug on one end. Plug features contacts with Option 2 Plating (Option 1 with additional Gold in Mating Area). Note: Total Gold Thickness in Mating Area is 30 microinches.

No. of Contacts	Cable Length	Black Color Cable and Overmold	Beige Color Cable and Overmold
	Meter	Part Number	Part Number
3	1	MDC-3P06	MDC-3P09
4	1	MDC-4P06	MDC-4P09
5	1	MDC-5P06	MDC-5P09
6	1	MDC-6P06	MDC-6P09
7	1	MDC-7P06	MDC-7P09
8	1	MDC-8P06	MDC-8P09

The above cable assemblies are recommended where greater contact durability is required.

Circular Mini Din Plug Components



Features

- Individual Components available for cable assembly with Overmolding
- Plug Insulator available with Contact positions 3, 4, 5, 6, 7, and 8
- Seamless Shield Case is crimped to cable shield; designed to meet FCC requirements for EMI/RFI suppression
- One Piece Shield Case —No extra ferrules or shields required with Cinch Shield Crimp Tools
- Contacts are Crimp Style and supplied on reels
- Contacts available with Gold over Nickel in several options
- Tools available to facilitate reliable, efficient termination

Ordering Information

For each Plug Assembly, the following components are needed: one Plug Insulator, one Shield Case, and adequate Contacts.

Component Type	Description	Quantity	Part Number
Plug Insulator	3 Position Insulator	1	MDX-3PI
	4 Position Insulator	1	MDX-4PI
	5 Position Insulator	1	MDX-5PI
	6 Position Insulator	1	MDX-6PI
	7 Position Insulator	1	MDX-7PI
	8 Position Insulator	1	MDX-8PI
Shield Case	Metal Shield Case		MDX-PZ
Contact	Option 1 Plating	300 on Reel	MDX-P-3A
	Option 1 Plating	15,000 on Reel	MDX-P-15A
	Option 2 Plating	300 on Reel	MDX-P-3B
	Option 2 Plating	15,000 on Reel	MDX-P-15B
	Option 3 Plating	15,000 on Reel	MDX-P-15D

The following tools are recommended for Mini Din Cable Plug Assembly. One tool of each type is required.

Tool Type	Description	Part Number
Contact Crimp	Stripper-Crimper Machine Complete, includes Dies*	MDT-P25
	Contact Crimp Hand Tool Crimps using 300 Contact Reels	MDT-P35
Contact Insertion	Contact Insertion Bench Mounted Tool	MDT-P33
	Contact Insertion Hand Tool	MDT-P28
	Fixture Used with MDT-P28	MDT-P29
Insulator Insertion	Insulator Insertion Bench Mounted Tool	MDT-P34
	Insulator Insertion Hand Tool	MDT-P30
Shield Crimp	Shield Crimp Die Set Requires 3 Ton Press	MDT-P31

*Consult Factory for retrofit of existing Stripper-Crimper Machines.

CINCH

Solutions That Connect.

Connector Division
1501 Morse Avenue
Elk Grove Village, Illinois 60007
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FAX: 312.981.6132
Telex: 287433

Cinch Connectors Ltd
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FAX: (0909) 478321
Telex: 54594

Connecteurs Cinch
Labinal
BP 218, 78051 St. Quentin En Yvelines
France
Telephone: 1 30 853282
FAX: 1 30 434171
Telex: 698330F

Cinch Connectors
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FAX: 089 7809926
Telex: 17 898848

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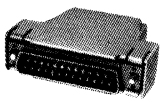
See Cinch Catalog C-100C and Data Sheets DS-01 and DS-02 for complete performance data.

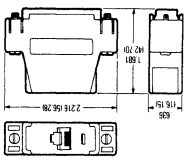
CINCH

Datacomm Adapter RS232 to Mod Jack Socket Interface



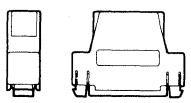
Type 1

Slim-line, one-piece hood with two captive 4-40 mounting screws. Best for most applications.



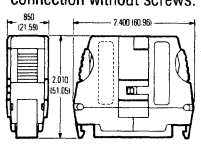
Type 3

Used when mating to a cable connector that has a hood with spring latches, this slim-line, one-piece hood is equipped with latching blocks for fast, easy, secure connection/disconnection without screws.



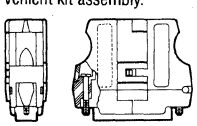
Type 4

Used when mating to a cable or panel mounted connector that has latch blocks, this two-piece adapter hood with spring latches allows for fast, easy, secure connection/disconnection without screws.



Type 5

Two-piece adapter hood with filler ends and two, captive 4-40 mounting screws snaps together for convenient kit assembly.



Features

- One piece slim-line housing saves space and provides six- or eight-wire modular access to RS232 input/output connector
- Consists of corrosion resistant 25- or 15-contact, D-Subminiature plugs or sockets, pre-wired to a non-keyed, six- or eight-wire modular jack
- Available with or without spring latches
- Pre-wired versions 100% inspected and tested
- Kits available for flexibility of "on-the-spot" wiring
- Hand termination tool available for reliable kit assembly
- UL/CSA approved

Ordering Information

Plug Style Adapter Prewired

Ref.	Hood Type	Modular Jack Position 1	2	3	4	5	6	7	8	Jumpers
	25 Position D-Subminiature to RJ45 8-wire modular jack									
FM-001	Type 1	7(AB)	4(CA)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	5(CB)	—
FM-002	Type 1	—	8(CF)	1	2(BA)	7(AB)	3(BB)	20(CD) & 6(CC)	—	4 to 5†
FM-003	Type 1	—	20(CD) & 6(CC)	1	3(BB)	7(AB)	2(BA)	8(CF)	—	4 to 5†
FM-004	Type 4	7(AB)	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	5(CB)	—
FM-005	Type 1	1	5(CB)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	4(CA)	—
FM-007	Type 1	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	5(CB)	—
FM-009	Type 4	1	5(CB)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	4(CA)	—
FM-010	Type 1	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD) & 6(CC)	7(AB)	5(CB)	—
FM-011	Type 4	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	5(CB)	—
FM-012	Type 4	1	5(CB)	2(BA)	20(CD)*	3(BB)	8(CF)**	7(AB)	4(CA)	—
FM-014	Type 1	—	—	19(SCA)	14(SBA)	7(AB)	16(SBB)	—	—	—
FM-015	Type 1	—	—	8(CF)	3(BB)	7(AB)	2(BA)	—	—	4 to 5†
FM-017	Type 1	7(AB)	5(CB)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	4(CA)	—
FM-018	Type 1	7(AB)	3(BB)	7(AB)	21 (RL/GC)	21 (RL/GC)	9	2(BA)	7(AB)	4 to 5† 6 to 20†
FM-020	Type 1	7(AB)	5(CB)	3(BB)	6(CC) & 8(CF)	2(BA)	20(CD)	7(AB)	4(CA)	—
FM-021	Type 1	7(AB)	4(CA)	2(BA)	20(CD)	3(BB)	6(CC) & 8(CF)	7(AB)	5(CB)	—
FM-023	Type 1	6(CC)	20(CD)	7(AB)	2(BA)	4(CA)	3(BB)	8(CF)	5(CB)	—
FM-025	Type 1	15(DB)	14(SBA)	11	3(BB)	13(SCB)	4(CA)	12(SCF/ CI)	2(BA)	—
FM-028	Type 1	1	—	2(BA)	4(CA)	3(BB)	5(CB)	7(AB)	—	9 to 20†
FM-029	Type 1	1	5(CB)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	4(CA)	—
FM-030	Type 1	5(CB)	6(CC)	3(BB)	20(CD)	2(BA)	7(AB)	22(CE)	4(CA)	—
FM-031	Type 1	4(CA)	20(CD)	2(BA)	6(CC)	3(BB)	7(AB)	22(CE)	5(CB)	—
FM-032	Type 1	1	4(CA)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	5(CB)	—
FM-033	Type 1	—	—	2(BA)	4(CA)	3(BB)	8(CF)	7(AB)	—	—
FM-036	Type 1	1	20(CD)	3(BB)	—	2(BA)	—	7(AB)	5(CB)	—
FM-045	Type 1	1	5(CB)	2(BA)	20(CD)	3(BB)	6(CC) & 8(CF)	7(AB)	4(CA)	—
	25 Position D-Subminiature to RJ11 6-wire modular jack									
FM-053	Type 1	—	2(BA)	—	7(AB)	3(BB)	—	—	—	—
	15 Position D-Subminiature to RJ45 8-wire modular jack									
FM15-001	Type 1	15(DB)	14(SBA)	11	3(BB)	13(SCB)	4(CA)	12(SCF/ L1)	2(BA)	—
FM15-002	Type 1	1	4(CA)	3(BB)	8(CF)	2(BA)	9	7(AB)	5(CB)	—
FM15-003	Type 1	5(CB)	7(AB)	8(CF)	3(BB)	9	2(BA)	4(CA)	1	—

Plug Style Adapter Kits

Ref.	Hood Type	Modular Jack Position 1	2	3	4	5	6	7	8	Jumpers
	25 Position D-Subminiature to RJ45 8-wire modular jack									
FM-006	Type 5	Unassembled Kit (Requires plier type termination tool, SD-UC. See in CINCH full-line catalog.)								
FM-016	Type 1	Unassembled Kit (Requires plier type termination tool, SD-UC. See in CINCH full-line catalog.)								
FM-034	Type 4	Unassembled Kit (Requires plier type termination tool, SD-UC. See in CINCH full-line catalog.)								
	25 Position D-Subminiature to RJ11 6-wire modular jack									
FM-013	Type 5	Unassembled Kit (Requires plier type termination tool, SD-UC. See in CINCH full-line catalog.)								
FM-052	Type 1	Unassembled Kit (Requires plier type termination tool, SD-UC. See in CINCH full-line catalog.)								

Socket Style Adapter Pre-Wired

Ref.	Hood Type	Modular Jack Position 1	2	3	4	5	6	7	8	Jumpers
	25 Position D-Subminiature to RJ45 8-wire modular jack									
FF-001	Type 1	7(AB)	4(CA)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	5(CB)	—
FF-002	Type 3	7(AB)	4(CA)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	5(CB)	—
FF-004	Type 1	—	8(CF)	1	2(BA)	7(AB)	3(BB)	20(CD)& 8(CC)	—	4 to 5†
FF-005	Type 1	—	20(CD)& 8(CC)	1	3(BB)	7(AB)	2(BA)	8(CF)	—	4 to 5†
FF-006	Type 1	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	5(CB)	—
FF-007	Type 4	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	5(CB)	—
FF-008	Type 1	1	5(CB)	2(BA)	20(CD)	3(BB)	8(CF)	7(AB)	4(CA)	—
FF-009	Type 1	7(AB)	3(BB)	8(CF)	4(CA)	20(CD)	5(CB)	6(CC)	2(BA)	—
FF-010	Type 1	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)& 6(CC)	7(AB)	5(CB)	—
FF-012	Type 1	7(AB)	4(CA)	2(BA)	20(CD)	3(BB)	6(CC)& 8(CF)	7(AB)	5(CB)	—
FF-013	Type 1	6(CC)	20(CD)	7(AB)	2(BA)	4(CA)	3(BB)	8(CF)	5(CB)	—
FF-015	Type 1	2(BA)	3(BB)	4(CA)	6(CC)	8(CF)	7(AB)	9	20(CD)	—
FF-016	Type 1	7(AB)	5(CB)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	4(CA)	—
FF-019	Type 1	20(CD)	7(AB)	5(CB)	3(BB)	4(CA)	2(BA)	8(CF)	1	—
FF-028	Type 1	1	4(CA)	3(BB)	8(CF)	2(BA)	20(CD)	7(AB)	5(CB)	8 to 5†
FF-030	Type 1	5(CB)	6(CC)	3(BB)	20(CD)	2(BA)	7(AB)	22(CE)	4(CA)	—
FF-031	Type 1	4(CA)	20(CD)	2(BA)	6(CC)	3(BB)	7(AB)	22(CE)	5(CB)	—
FF-038	Type 1	7(AB)	4(CA)	3(BB)	20(CD)	2(BA)	6(CC)& 8(CF)	7(AB)	5(CB)	—

Socket Style Adapter Kits

Ref.	Hood Type	Modular Jack Position 1	2	3	4	5	6	7	8	Jumpers
	25 Position D-Subminiature to RJ45 8-wire modular jack									
FF-003	Type 5	Unassembled Kit (Requires plier type termination tool, SD-UC. See CINCH full-line catalog.)								
FF-001	Type 1	Unassembled Kit (Requires plier type termination tool, SD-UC. See CINCH full-line catalog.)								

†D-Subminiature positions are jumpered together
*Diode assembled between modular jack position #4 and D-Subminiature position #20
**Diode assembled between D-Subminiature positions #8 and #20

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See Cinch Catalog C-100C and Data Sheet DS-03 for complete performance data.

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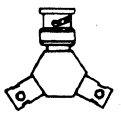
BNC Jack-Plug-Jack
"T"
1-24: $4.50
25-49: $3.85
50-99: $3.50
100+: $3.15

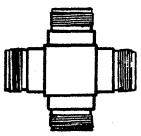
CA3004-A
BNC Jack-Jack-Plug
"T"
1-24: $19.60
25-49: $17.15
50-99: $15.85
100+: $14.70

CA3004-G
BNC Jack-Plug-Jack
"Goalpost"
1-24: $22.50
25-49: $19.70
50-99: $18.20
100+: $16.85

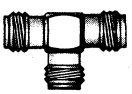
CA3004-Y
BNC Jack-Plug-Jack
"Y"
1-24: $15.00
25-49: $13.15
50-99: $12.15
100+: $11.25



CA3018
'N' 4-Way Jack
1-24: $12.95
25-49: $11.00
50-99: $ 9.90
100+: $ 8.90



CA3025
TNC Jack-Jack-Jack
"T"
1-24: $4.40
25-49: $3.75
50-99: $3.40
100+: $3.05



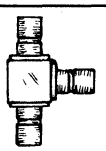
CA3040
SMA Plug to Plug
Straight
1-24: $11.90
25-49: $ 9.45
50-99: $ 8.95
100+: $ 8.50

CA3041
SMA Jack to Jack
Straight
1-24: $8.00
25-49: $6.80
50-99: $6.15
100+: $5.55

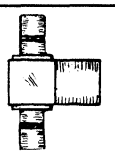
CA3050
SMB Jack to Jack
Straight
1-24: $8.15
25-49: $6.55
50-99: $5.90
100+: $5.30

CA3052
SMB Jack to Jack
Bulkhead
1-24: $7.55
25-49: $6.05
50-99: $5.45
100+: $4.90

CA3053
SMB Jack-Jack=Jack
"T"
1-24: $19.95
25-49: $15.95
50-99: $14.40
100+: $12.95



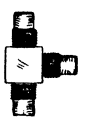
CA3054
SMB Jack-Plug-Jack
"T"
1-24: $19.95
25-49: $17.30
50-99: $16.45
100+: $15.65



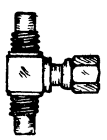
CA3060
SMC Jack to Jack
Straight
1-24: $7.80
25-49: $6.25
50-99: $5.65
100+: $5.10

CA3062
SMC Jack to Jack
Bulkhead
1-24: $8.05
25-49: $6.80
50-99: $6.15
100+: $5.55

CA3063
SMC Jack-Jack-Jack
"T"
1-24: $18.30
25-49: $14.65
50-99: $13.20
100+: $11.85



CA3064
SMC Jack-Plug-Jack
"T"
1-24: $18.50
25-49: $15.30
50-99: $14.50
100+: $13.80



CA3201
BNC Plug to N Jack
Straight
1-24: $7.50
25-49: $6.40
50-99: $5.75
100+: $5.20

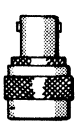
CA3208
BNC Plug to UHF Plug
Straight
1-24: $5.50
25-49: $4.70
50-99: $4.25
100+: $3.85

CA3209
BNC Plug to UHF Jack
Straight
1-24: $2.95
25-49: $2.55
50-99: $2.30
100+: $2.10

CA3210
BNC Jack to UHF Plug
Straight'
1-24: $2.95
25-49: $2.55
50-99: $2.30
100+: $2.10

CA3211
BNC Plug to C Jack
Straight
1-24: $35.25
25-49: $29.95
50-99: $26.95
100+: $24.25

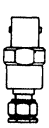
CA3212
BNC Jack to C Plug
Straight
1-24: $38.00
25-49: $32.30
50-99: $29.10
100+: $26.20



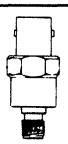
CA3214
BNC Plug to SMA Plug
Straight
1-24: $20.85
25-49: $17.75
50-99: $15.95
100+: $14.35

CA3215
BNC Plug to SMA Jack
Straight
1-24: $14.50
25-49: $12.35
50-99: $11.15
100+: $10.05

CA3216
BNC Jack to SMA Plug
Straight
1-24: $14.50
25-49: $12.35
50-99: $11.15
100+: $10.05

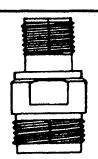


CA3217
BNC Jack to SMA Jack
Straight
1-24: $14.50
25-49: $12.35
50-99: $11.15
100+: $10.05



CA3231
N Plug to TNC Jack
Straight
1-24: $12.00
25-49: $10.20
50-99: $ 9.20
100+: $ 8.30

CA3233
N Jack to TNC Jack
Straight
1-24: $27.00
25-49: $22.95
50-99: $20.65
100+: $18.60



CA3242
N Plug to SMA Plug
Straight
1-24: $29.40
25-49: $25.00
50-99: $22.50
100+: $20.25

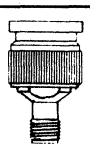
CA3243
N Plug to SMA Jack
Straight
1-24: $16.90
25-49: $14.40
50-99: $12.95
100+: $11.65

CA3244
N Jack to SMA Plug
Straight
1-24: $16.90
25-49: $14.40
50-99: $12.95
100+: $11.65

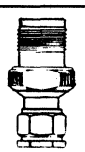
CA3245
N Jack to SMA Jack
Straight
1-24: $21.15
25-49: $18.00
50-99: $16.20
100+: $14.60

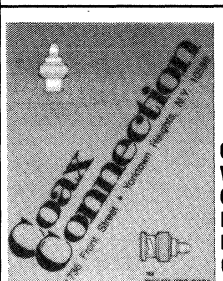
CA3261
TNC Plug to SMA Plug
Straight
1-24: $30.20
25-49: $25.70
50-99: $23.15
100+: $20.85

CA3262
TNC Plug to SMA Jack
Straight
1-24: $13.75
25-49: $11.70
50-99: $10.55
100+: $ 9.50



CA3263
TNC Jack to SMA Plug
Straight
1-24: $16.50
25-49: $14.05
50-99: $12.65
100+: $11.40





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CA3264
TNC Jack to SMA Jack
Straight
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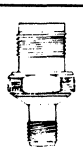
25-49: $13.55
50-99: $12.20
100+: $10.95



CA3277
UHF Plug to SMA Jack
Straight
1-24: $9.20
25-49: $7.85
50-99: $7.10
100+: $6.40

CA3278
UHF Jack to SMA Plug
Straight
1-24: $9.20
25-49: $7.85
50-99: $7.10
100+: $6.40

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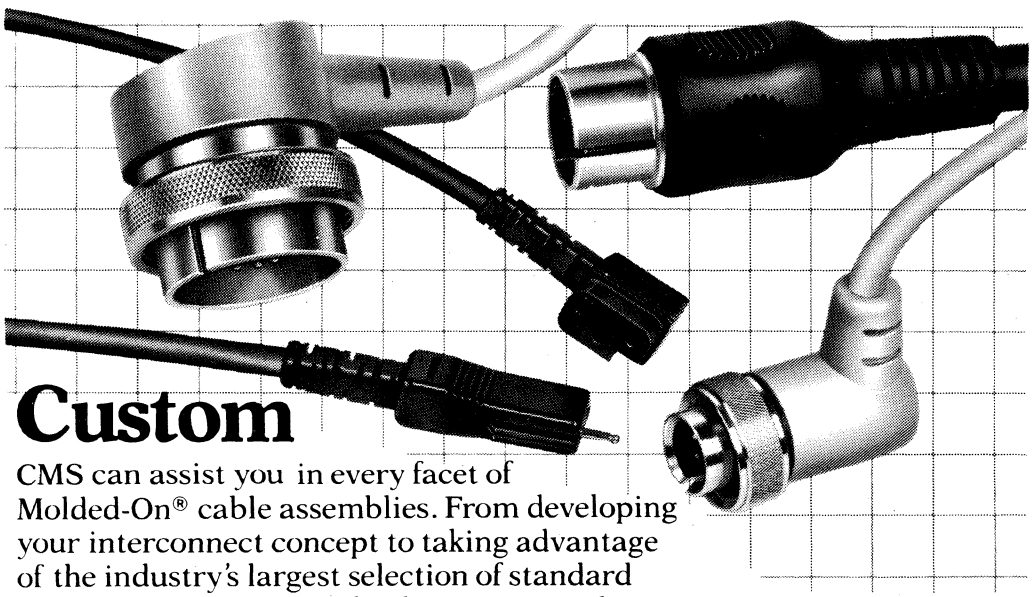

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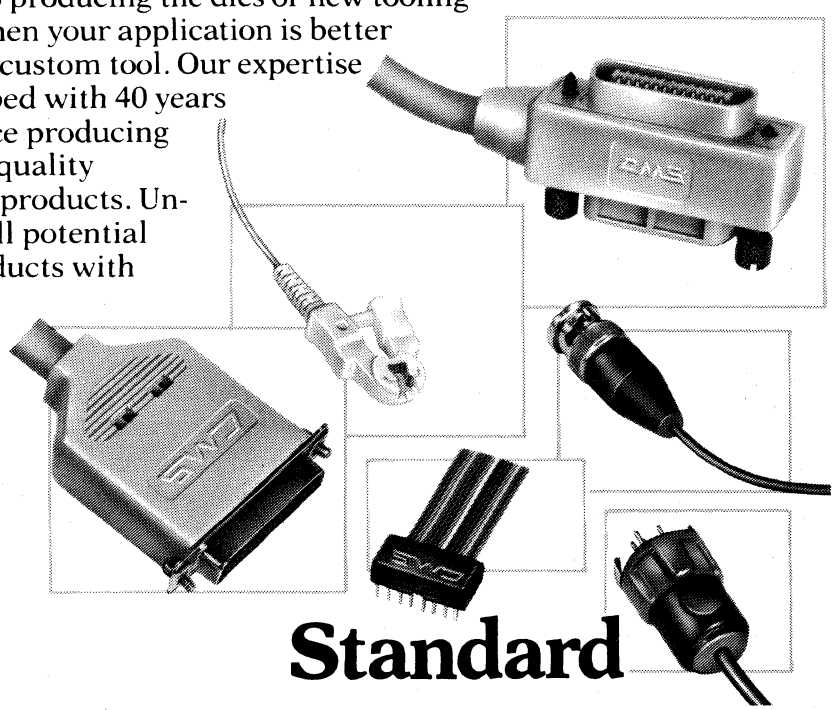

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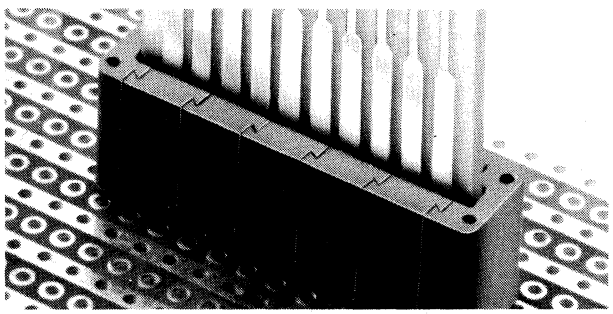
"MODULAR" CARD EDGE CONNECTORS

CUSTOM CONNECTORS, OFF THE SHELF!

MDR-100 SERIES



FEATURES:

- **Exceptional Performance** — Exclusive Heat-treated Cu/Ni/Sn
- **Low Profile** — .270" Slot Depth
- **Modular Construction** — Broadest Contact Pair Selection

SPECIFICATIONS:

MATERIALS:
Contact: .0201" Dia. Cu/Ni/Sn Spinodal Alloy #729 Heat Treated After Forming. #25 Alloy, QQ-C-530
Contact Finish: See ordering information (gold plate per MIL-G-45204)
Insulator: 30% glass filled polyester thermoplastic: blue; rated 94V-O
MECHANICAL:
P.C. Board Thickness: .054" to .071" (.062" nominal)
Insertion Force: 8.4 oz./contact pair w/.062" mating board
Withdrawal Force: 6.2 oz./contact pair w/.062" mating board
Contact Durability: 5000 mating cycles minimum
ELECTRICAL:
Contact Resistance: .006 ohm
Insulation Resistance: greater than 5000 megohm
Dielectric Withstand: 2500 VAC at sea level
Maximum Current: 2.0 amps

ORDERING INFORMATION:

Example: MDR-100 - 08 - 1 - 1

SERIES DESIGNATION:
MDR100 (.100" x .200" row)

NUMBER OF DUAL CONTACT POSITIONS:
4 through 50
(8 through 100 contacts)

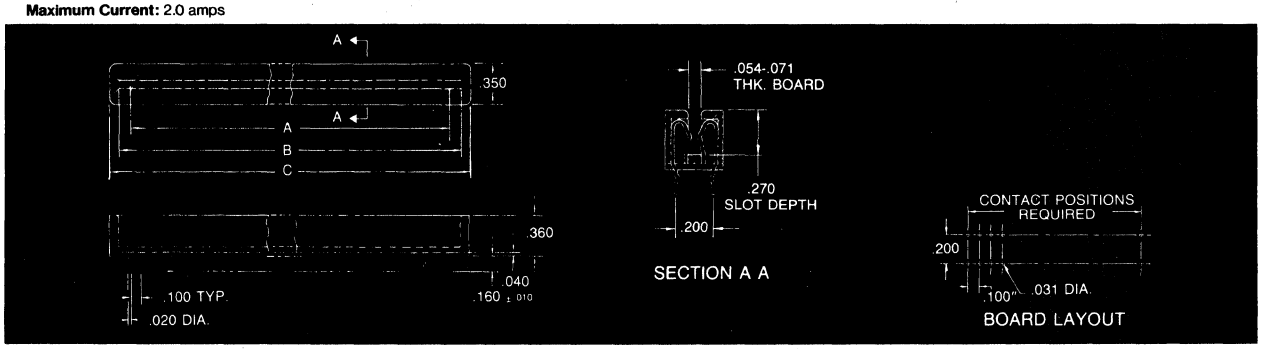
CONTACT PLATING CODE:
1: .00001" gold over .00005" nickel
2: .0001" electro-tin over .00005" nickel
3: .00003" gold over .00005" nickel
4: .0001" nickel

RECEPTACLE CONFIGURATION:
1: End Caps
2: Open ends
3: Integrally mounted card guide

POLARIZATION KEYING:
BETWEEN CONTACT:
Specify P/N MDR-B

MDR 100 DIMENSION CHART:

P/N	Number of Dual Positions	A	B	C
MDR100-2	2	.100	.300	.460
MDR100-3	3	.200	.400	.560
MDR100-4	4	.300	.500	.660
MDR100-5	5	.400	.600	.760
MDR100-6	6	.500	.700	.860
MDR100-7	7	.600	.800	.960
MDR100-8	8	.700	.900	1.060
MDR100-9	9	.800	1.000	1.160
MDR100-10	10	.900	1.100	1.260
MDR100-11	11	1.000	1.200	1.360
MDR100-12	12	1.100	1.300	1.460
MDR100-13	13	1.200	1.400	1.560
MDR100-14	14	1.300	1.500	1.660
MDR100-15	15	1.400	1.600	1.760
MDR100-16	16	1.500	1.700	1.860
MDR100-17	17	1.600	1.800	1.960
MDR100-18	18	1.700	1.900	2.060
MDR100-19	19	1.800	2.000	2.160
MDR100-20	20	1.900	2.100	2.260
MDR100-21	21	2.000	2.200	2.360
MDR100-22	22	2.100	2.300	2.460
MDR100-23	23	2.200	2.400	2.560
MDR100-24	24	2.300	2.500	2.660
MDR100-25	25	2.400	2.600	2.760
MDR100-26	26	2.500	2.700	2.860
MDR100-27	27	2.600	2.800	2.960
MDR100-28	28	2.700	2.900	3.060
MDR100-29	29	2.800	3.000	3.160
MDR100-30	30	2.900	3.100	3.260
MDR100-31	31	3.000	3.200	3.360
MDR100-32	32	3.100	3.300	3.460
MDR100-33	33	3.200	3.400	3.560
MDR100-34	34	3.300	3.500	3.660
MDR100-35	35	3.400	3.600	3.760
MDR100-36	36	3.500	3.700	3.860
MDR100-37	37	3.600	3.800	3.960
MDR100-38	38	3.700	3.900	4.060
MDR100-39	39	3.800	4.000	4.160
MDR100-40	40	3.900	4.100	4.260
MDR100-41	41	4.000	4.200	4.360
MDR100-42	42	4.100	4.300	4.460
MDR100-43	43	4.200	4.400	4.560
MDR100-44	44	4.300	4.500	4.660
MDR100-45	45	4.400	4.600	4.760
MDR100-46	46	4.500	4.700	4.860
MDR100-47	47	4.600	4.800	4.960
MDR100-48	48	4.700	4.900	5.060
MDR100-49	49	4.800	5.000	5.160
MDR100-50	50	4.900	5.100	5.260



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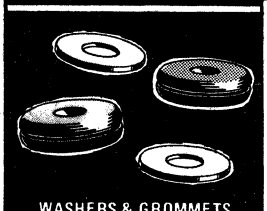
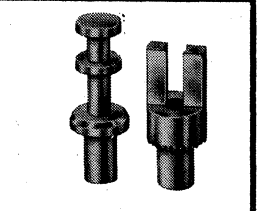
Presenting . . .

SMA-SMB-SMC
RF CONNECTORS

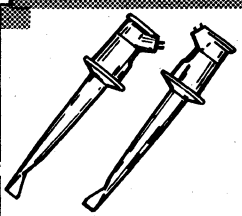
TEFLON* TERMINALS

HEXHEAD BINDING POST

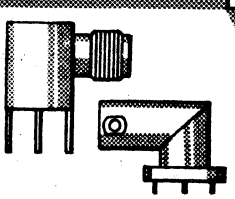

WASHERS & GROMMETS

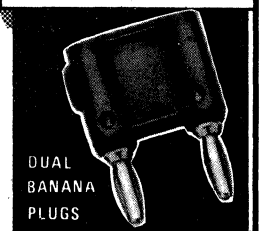

SOLDER LUGS

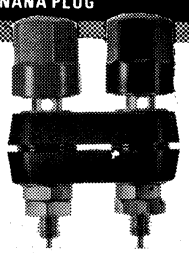
MINIATURE STACKING BANANA PLUG TO STANDARD STACKING BANANA PLUG

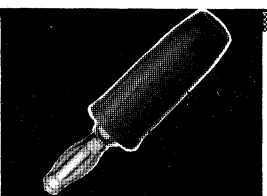

SAFETY HOOK TEST CLIPS

SHORTING PLUGS

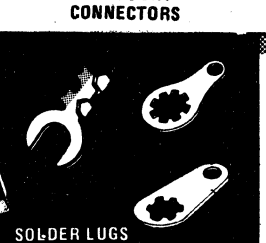

P.C. MOUNT CONNECTORS

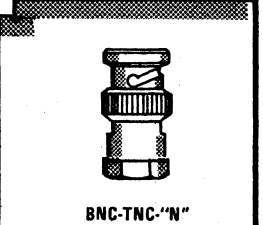

DUAL BANANA PLUGS

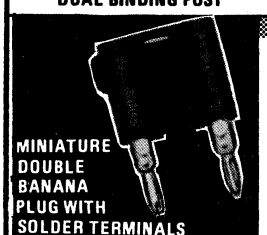

DUAL BINDING POST

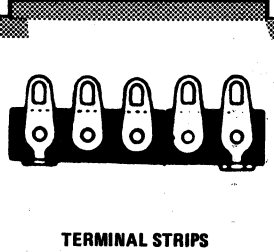

BANANA PLUGS

SEND FOR CATALOG

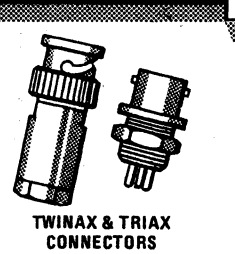

SOLDER LUGS

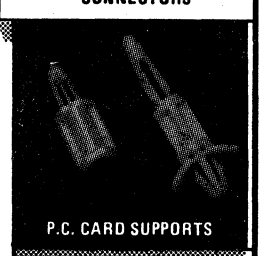

BNC-TNC-"N" CONNECTORS


MINIATURE DOUBLE BANANA PLUG WITH SOLDER TERMINALS

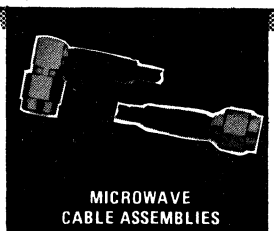

TERMINAL STRIPS

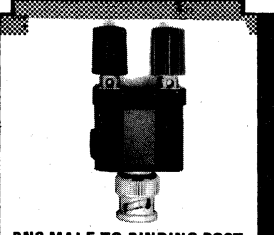
HEXHEAD NYLON FEED THRU

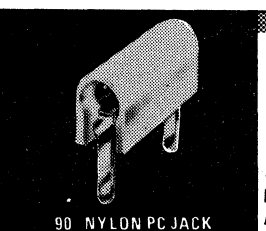

TWINAX & TRIAX CONNECTORS

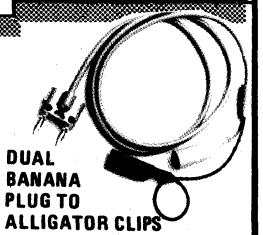

P.C. CARD SUPPORTS

INSULATED TIP PLUGS


MICROWAVE CABLE ASSEMBLIES


BNC MALE TO BINDING POST


90° NYLON PC JACK


DUAL BANANA PLUG TO ALLIGATOR CLIPS ADAPTER CABLE

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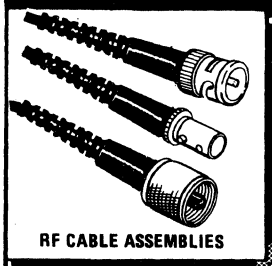
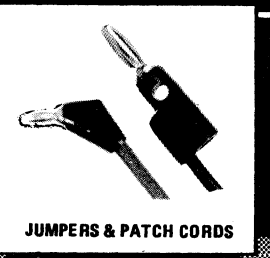
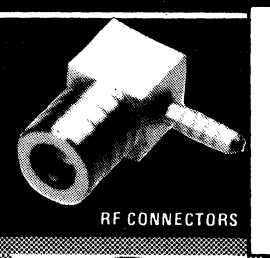
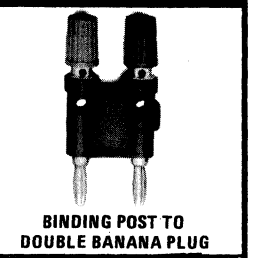
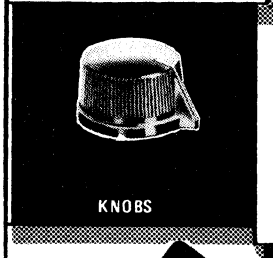

RF CABLE ASSEMBLIES

SOLDERLESS LUGS & TERMINALS

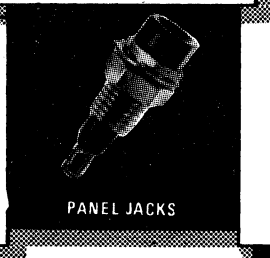

JUMPERS & PATCH CORDS

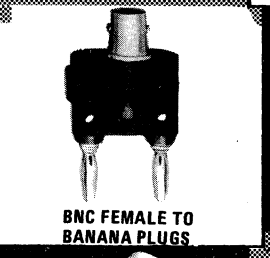

RF CONNECTORS

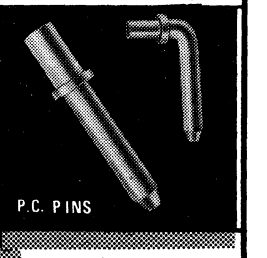

BINDING POST TO DOUBLE BANANA PLUG

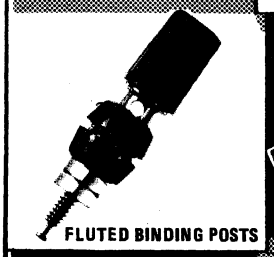

KNOBS

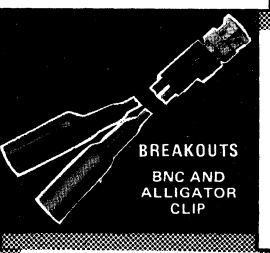
TEST POINT JACKS


PANEL JACKS

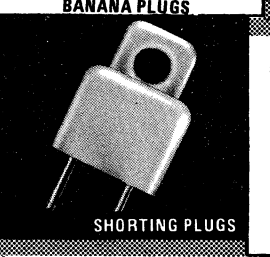

BNC FEMALE TO BANANA PLUGS

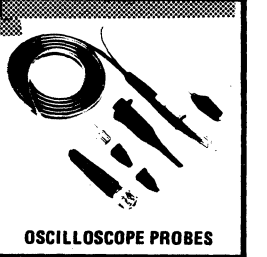

P.C. PINS

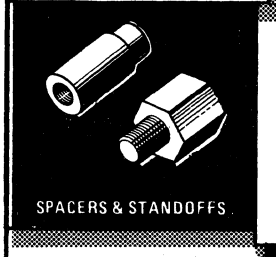

FLUTED BINDING POSTS

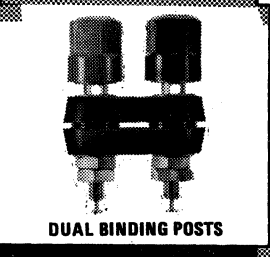

BREAKOUTS BNC AND ALLIGATOR CLIP

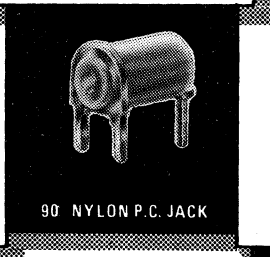
TEST ACCESSORIES


SHORTING PLUGS

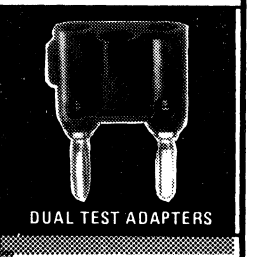

OSCILLOSCOPE PROBES

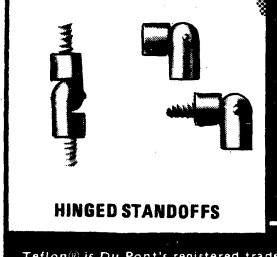

SPACERS & STANDOFFS


DUAL BINDING POSTS


90° NYLON P.C. JACK

MIL-C-39024 JACKS

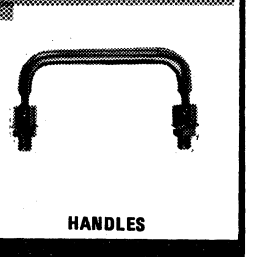

DUAL TEST ADAPTERS


HINGED STANDOFFS

TEFLON* PANEL JACKS

SAFETY HOOK TEST CLIPS

SAFETY TEST PROBE TO SHROUDED BANANA PLUG


HANDLES

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Your order is expressly made to agreed specifications. As each requirement usually involves special features and combinations of materials and finishes, we do not stock finished products. However, we do stock most of the materials, enabling us to manufacture your parts as needed to meet your schedule.

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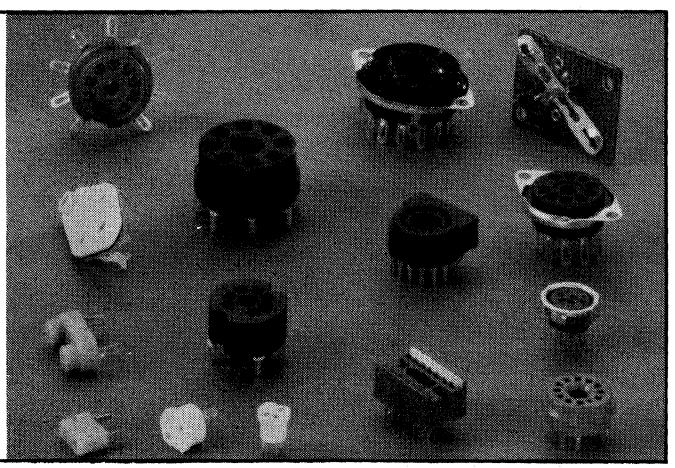
Our production facilities are fully integrated from raw materials to final assembly. We do our own stamping and molding. We also design and build our own automatic assembly equipment. This allows us to control our processes and thus serve you with our Zero Defect Program quality.

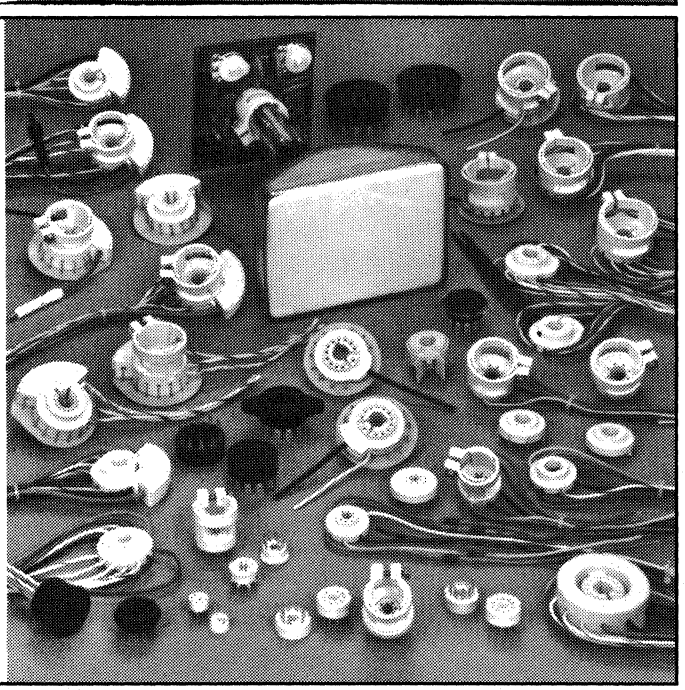
SOCKETS

- **Tube/Relay:** 4, 5, 7, 8, 9, 10, 11, 12, 14, 16, 20, 22 and other pin configurations. PC, solder tab and chassis mount. Molded and laminated constructions. Metal or molded saddle, top or bottom mount.
- **Transistor:** T03, 5, 9, 11, 12, 18, 33, 39, 40, 46, 52, 60, 66, 72, 104 and others.
- **Crystal:** .486" pin centers for HC-6/U, HC-13/U, HC-14/U, HC-27/U, HC-36/U & HC-48/U, MIL-S-12883/4; .273" pin centers for HC-46/U; .192" pin centers for HC25/U, HC-42/U, HC-43/U, HC-49/U, HC-50/U and others.



CRT SOCKETS

- For high resolution CRTs used in Avionics, CAD/CAM, Sonar, Radar, Information Displays, Medical and Measurement Instruments
- **Tube neck retaining clamp option available on most sockets.**
- Mate with most JEDEC and other base configurations.
- PC, solder tab and wire lead connections. PC and flying lead combination. New designs welcome.
- With or without Spark Gaps.
- In-line resistors, chokes and capacitors.



CONNECTOR CORPORATION
6025 N Keystone Ave. • Chicago, IL 60646-5290 • 312/539-3108 • TWX 910-221-6059 • FAX 312/539-3825

CONNECTOR CORPORATION

Manufacturer of Quality American-Made Connectors.

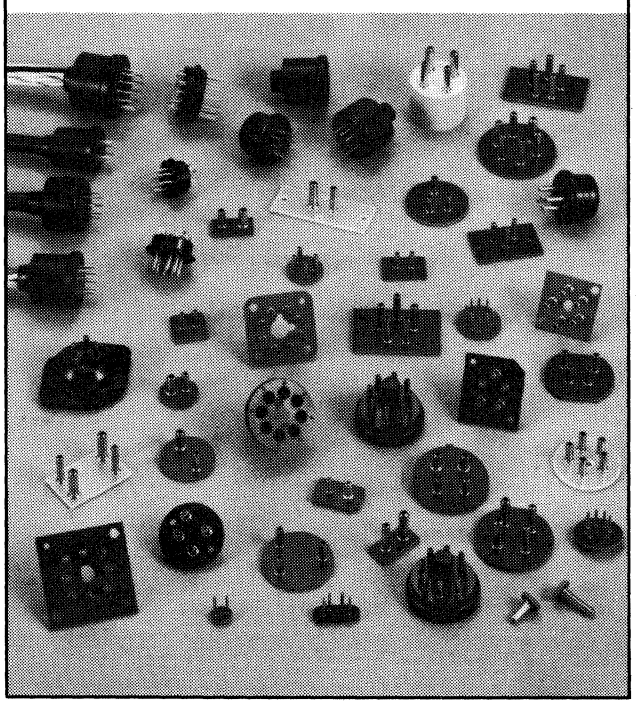
Plugs to Your Requirements

Industrial • Military • Commercial • Prototype through Production

For samples and quotes, call our engineers at 312/539-3108 or FAX 312/539-3825.

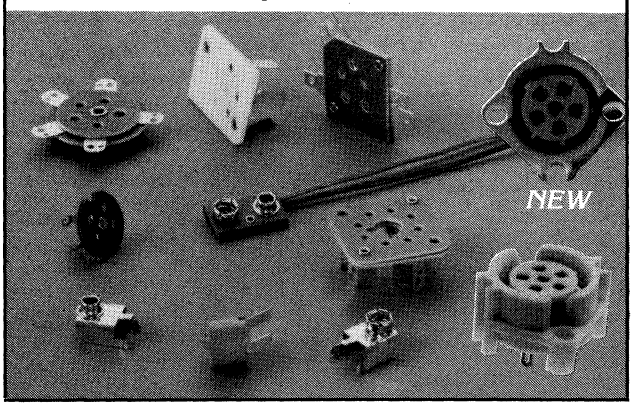
PLUGS

- Molded and laminated constructions.
- 1 to 12 pins.
- Polarized.
- Mate with many of our sockets.
- Molded Boots for insulation.
- Industrial, Military and Commercial.



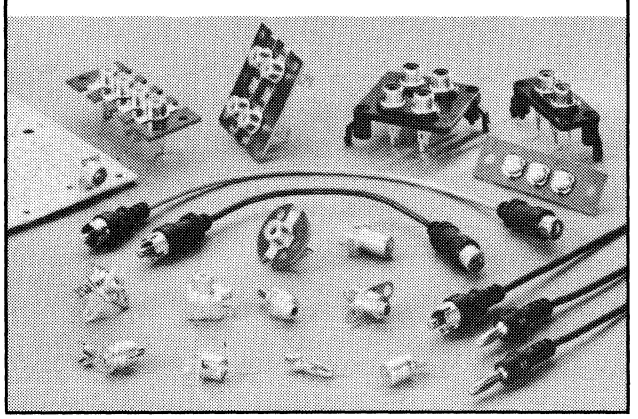
BATTERY CONNECTORS, SOCKETS AND PLUGS

- Molded or laminated constructions.
- Industrial, Military and Commercial.



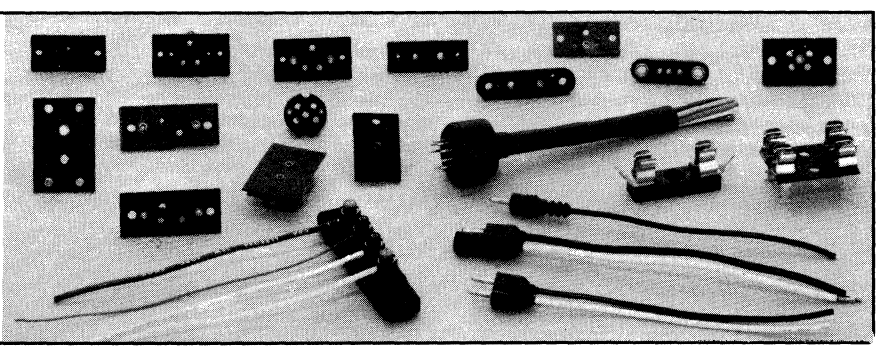
AUDIO & RF CONNECTORS

- UHF and VHF. • PC, chassis or free standing.
- Sockets & Plugs. • Vertical and right angle.



OTHER INTERCONNECTING DEVICES

- Wyrlok™ molded quick connecting device.
- Molded and laminated connectors.
- Laminated receptacles.
- Fuse & Rectifier holders.



CONNECTOR CORPORATION
6025 N. Keystone Ave. • Chicago, IL 60646-5290 • 312/539-3108 • TWX 910-221-6059 • FAX 312/539-3825

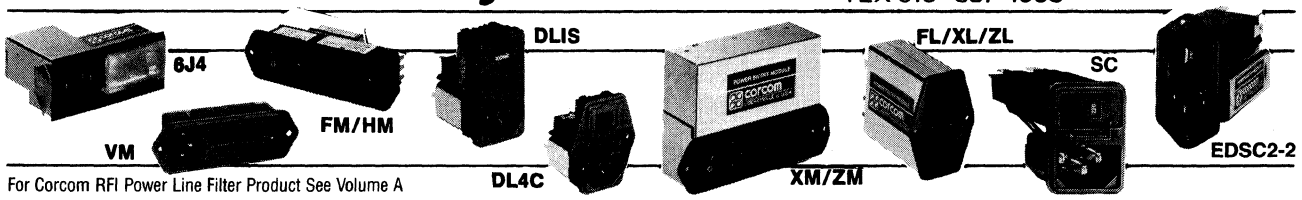
MAXIMUM CURRENT CAPACITY—CONDUCTORS

Size, AWG	MIL-W-5088				National Electrical Code	Underwriters Laboratory		American Insurance Association	500 c mils/A
	Copper		Aluminum			60°C	80°C		
	Single-wire	Wire-bundled	Single-wire	Wire-bundled					
30	...	...	...	...	...	0.2	0.4	...	0.20
28	...	...	...	...	...	0.4	0.6	...	0.32
26	...	...	...	...	...	0.6	1.0	...	0.51
24	...	...	...	...	...	1.0	1.6	...	0.81
22	9	5	...	...	...	1.6	2.5	...	1.28
20	11	7.5	...	...	...	2.5	4.0	3	2.04
18	16	10	...	...	6	4.0	6.0	5	3.24
16	22	13	...	...	10	6.0	10.0	7	5.16
14	32	17	...	...	20	10.0	16.0	15	8.22
12	41	23	...	...	30	16.0	26.0	20	13.05
10	55	33	...	...	35	...	...	25	20.8
8	73	46	58	36	50	...	...	35	33.0
6	101	60	86	51	70	...	...	50	52.6
4	135	80	108	64	90	...	...	70	83.4
2	181	100	149	82	125	...	...	90	132.8
1	211	125	177	105	150	...	...	100	167.5
0	245	150	204	125	200	...	...	125	212.0
00	283	175	237	146	225	...	...	150	266.0
000	328	200	...	...	275	...	...	175	336.0
0000	380	225	...	...	325	...	...	225	424.0

corcom

Power Entry Modules

World Leader In RFI Technology
1600 Winchester Road
Libertyville, IL 60048 USA
312-680-7400
TLX 910-687-1058



For Corcom RFI Power Line Filter Product See Volume A

L SERIES

The L series is a multi-function power entry module with exceptional RFI filtering capability. By combining in one unit all the necessary primary power components, the L series meets the requirements of the manufacturer whose products are marketed worldwide.

FEATURES

- High performance RFI filter
- IEC power line connector
- North American or European fusing capability
- DPST on/off switch or voltage selection
- EXL designed for emission control/FCC-B
- EZL designed for emission control/FCC-B, VDE-B

Part	Features	Size L x W x D	Rated Current
5EFL2S	2 volt select, DPST Switch	1.97 x 2.57 x 3.16"	5A
3EXL2S	2 volt select, DPST Switch	1.97 x 2.57 x 4.16"	3A
3EZL2S	2 volt select, DPST Switch	1.97 x 2.57 x 4.16"	3A
2EDL1S*	DPST On/Off Switch	1.98 x 2.30 x 2.21"	2A
4EDL1S*	DPST On/Off Switch	1.98 x 2.30 x 2.21"	4A
6EDL1S*	DPST On/Off Switch	1.98 x 2.30 x 2.01"	6A
2EDL4*	4 voltage selection	1.98 x 2.30 x 2.01"	2A
4EDL4*	4 voltage selection	1.98 x 2.30 x 2.01"	4A
6EDL4*	4 voltage selection	1.98 x 2.30 x 2.01"	6A

* These models available as snap in units (add C suffix) 1.28 x 2.30 x 2

M SERIES

Power Entry Module

The power entry module expands the options of the manufacturer whose products are marketed worldwide, One, component, fully assembled and tested, provides the capability of interfacing your multi-voltage power supply to any common voltage or fusing scheme in the world, without modification.

Filtered Power Entry Modules

Combines the power entry modules with a choice of three filter performances: FM models for susceptibility control, XM models for emission control/FC-C-B, and ZM models for emission controls/FCC-B and VDE-B. HM models available for medical applications for UL 544 low leakage current requirements.

Type	Description	Size L x W x D	Rated Current
6VM4S	IEC Connector, DPST On/Off Switch 4 voltage selection, selectable fuse holder	4.65 x 1.14 x 1.45"	6A
6VM2S	IEC Connector, DPST On/Off Switch 2 voltage selection, selectable fuse holder	4.65 x 1.14 x 1.45"	6A
6VM1S	IEC Connector, DPST On/Off Switch selectable fuse holder	4.17 x 1.14 x 1.45"	6A
6VM4	IEC Connector, 4 voltage selection selectable fuse holder	3.88 x 1.14 x 1.45"	6A
6VM2	IEC Connector, 2 voltage selection selectable fuse holder	3.88 x 1.14 x 1.45"	6A
6VM1	IEC Connector, selectable fuse holder	3.39 x 1.14 x 1.45"	6A

FEATURES OF M SERIES

- IEC power line connector
- North American Metric fusing
- DPST on/off switch
- 2 or 4 voltage selection
- 3-6 amps (prefix indicates rated current)
- Offered in Filtered or Non-filtered models

Note: FM and HM Models allow front and back mounting.
XM and ZM Models allow back mounting only.

* FM Models only ** VM Models only

Part	Features	Size L x W x D	Rated Current
5EFM1/ 5EHM1	IEC Connector, selectable fuse holder	3.39 x 1.14 x 2.19"	5A
5EFM1S/ 5EHM1S	DPST On/Off Switch	4.17 x 1.14 x 2.19"	5A
5EFM4/ 5EHM4	4 voltage selection	3.88 x 1.14 x 2.19"	5A
5EFM4S/ 5EHM4S	4 voltage selection DPST On/Off Switch	4.65 x 1.14 x 2.19"	5A
3EXM1S	DPST On/Off Switch	4.17 x 3.09 x 1.72"	3A
3EXM4	4 voltage selection	3.88 x 3.09 x 1.72"	3A
3EXM4S	4 voltage selection DPST On/Off Switch	4.65 x 3.09 x 1.72"	3A
3EZM1S	DPST On/Off Switch	4.17 x 3.09 x 1.72"	3A
3EZM4	4 voltage selection	3.88 x 3.09 x 1.72"	3A
3EZM4S	4 voltage selection DPST On/Off Switch	4.65 x 3.09 x 1.72"	3A

J SERIES

Voltage Selecting & Fused Connectors

Developed for the manufacturer who markets his products worldwide. Eliminates internal wiring changes, special power supplies or stocking various line cords.

VS & F, in less than 3½ square inches of panel space, provides an internationally approved connector, fuse holder and a means to change transformer primary connections with a unique voltage selector card. Can be operated any place in the world without modification at time of installation. Available with a built-in filter for RFI protection of the equipment. UL recognized and CSA certified. 6VJ1 is VDE approved.

Type	Description	Max. Size L x W x D	Rated Current
6VJ1	Unfiltered	2.68 x 1.17 x 1.23"	6A
6J4	Filtered	2.68 x 1.17 x 1.57"	6A

Replacement Circuit Cards

Type	For Voltages
70-1470	100, 120, 220, 240
70-1495	115 & 230

Additional Mounting Clips (for panels thicker than .090")

Type	Description
45-1676	Plated (for 6J4)
45-2277	Insulated (for 6VJ1)

SC SERIES

Power Entry Modules with Voltage Selection

EDSC SERIES

Power Entry Modules with RFI Power Line Filters and Voltage Selection

The ESC series are 2 or 3 function compact packages with 16 amp ratings. They are available either in snap-in or flange mounting for various panel thickness.

The EDSC series are similar to the ESC series but include RFI filtering capability. The filter is for general purpose applications where line-to-line or line-to-ground noise must be controlled.

*Applied For

Part	Voltage Selection Positions and Features	Size L x W x D	Mounting	Panel Thickness
16ESC4-1	4	1.181 x 2.283 x 2.165	Flange	—
16ESC2-1	2	1.181 x 2.283 x 2.165	Flange	—
16ESC4C1	4	1.181 x 1.712 x 2.165	Snap-in	0.059
16ESC4D1	4	1.181 x 1.712 x 2.165	Snap-in	0.079
16ESC2C1	2	1.181 x 1.712 x 2.165	Snap-in	0.059
16ESC2D1	2	1.181 x 1.712 x 2.165	Snap-in	0.079
16ESC1-1	None	1.181 x 2.283 x 2.165	Flange	—
16ESC1C1	None	1.181 x 2.283 x 2.165	Snap-in	0.059
16ESC1D1	None	1.181 x 2.283 x 2.165	Snap-in	0.079
1EDSC2-2	Filtered-1 Amp	1.181 x 2.283 x 2.56	Flange	—
3EDSC2-2	Filtered-3 Amp	1.181 x 2.283 x 2.56	Flange	—
6EDSC2-2	Filtered-6 Amp	1.181 x 2.283 x 2.56	Flange	—
10EDSC2-2	Filtered-10 Amp	1.181 x 2.283 x 2.56	Flange	—

CURTIS

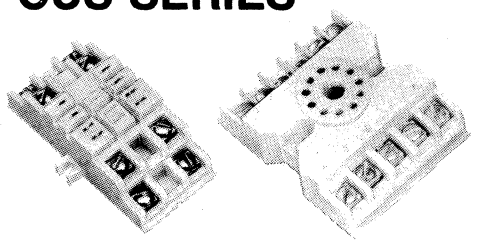
For All Your Relay Socket Needs

Curtis offers a broad selection of quality relay sockets to meet all your needs. And if you don't see exactly what you're looking for here, we'll gladly design you a custom.

Standards come in a wide variety of styles, sizes, capacities, with outstanding features like closed-back thermoplastic construction that resists breakage and eliminates panel insulation. Designed to provide maximum relay retention and electrical continuity. Curtis sockets are rated up to 15 amps/300 volts. Most are UL recognized and CSA certified.

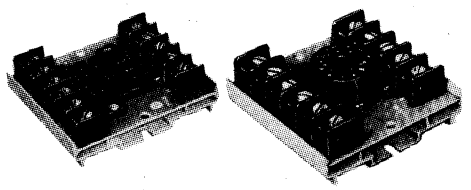
RELAY SOCKETS

CUS SERIES



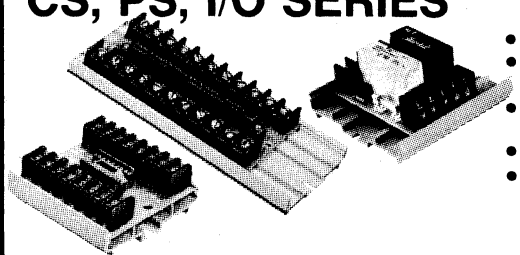
- New, unitized thermoplastic sockets with closed-back design which eliminates panel insulation, resists breakage.
- Barrier-type terminals with 6-32 nickel-plated screws and captivated nut for fast, easy connection.
- Octal and square-base assemblies.
- 5, 8, 11, 14, and 15-pin unitized relay-type sockets.
- Permanent-numbered terminals for easy identification.
- Surface-mount or snap-in track modular assembly. 48" track holds up to 42 sockets.
- Ratings to 15 amps/250 volts.
- Accommodates up to No. 12 AWG wire.

RS SERIES



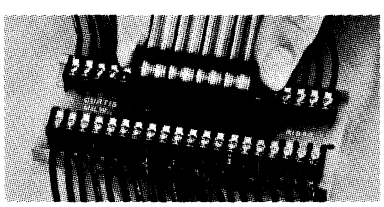
- Compact printed-circuit design featuring glass epoxy G-10 PC boards.
- High-quality sockets for maximum relay retention and electrical conductivity.
- Screw-type terminals with captivated wire clamps eliminate lugging.
- 8, 10, 11, 14, 15, 16-pin octal and square-base assemblies for maximum application flexibility.
- Track mountable with up to 24-socket capacity on 48" long track.
- Wire capacity: Up to 12 AWG.
- Electrical ratings up to 15 amps/250 volts.

CS, PS, I/O SERIES



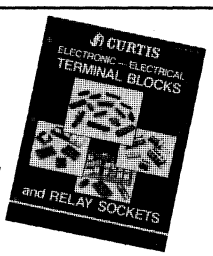
- 14 and 16-pin dual in-line integrated circuit socket assemblies.
- PC-board edge connector assemblies that eliminate hand soldering operations.
- Input/output module sockets accept all standard I/O modules and feature on-board fuse, LED status indicator, and pull-up resistor.
- All track mountable for optimum assembly convenience.
- Ratings to 5 amps/250 volts.

RIS SERIES



- Ribbon/cable interface sockets that solve the problem of mating ribbon or flat cable with discrete wiring.
- Track mounting provides assembly versatility for single or multiple units.
- Terminal blocks feature wire clamps that eliminate need for lugs or wrapping wires.
- Rating: 1 amp/125 volts.
- Accommodates up to No. 16 AWG wire.

Send for NEW 48-page engineering catalog.



"We Build Confidence!"

CURTIS INDUSTRIES, INC.

7400 W. Douglas Avenue, P.O. Box 18699
Milwaukee, Wisconsin 53218-0699
414/535-1500, Twx 910-262-3035, Fax 414/535-1150

CURTIS

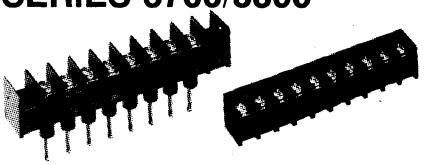
Number One For Electronic/Electrical Terminal Blocks

Wide selection, better features, aggressive prices make Curtis your Number One source for high quality, economical electronic and electrical terminal blocks. Curtis offers everything from printed-circuit mount electronic blocks to heavy-load, high-current electrical blocks rated at 250 amps, 600 volts. Most are UL recognized, CSA certified.

If you don't see what you need here, remember, we do customs, too! With more than 55 years of experience to build on, it makes good sense to come to Curtis FIRST for all your terminal block needs.

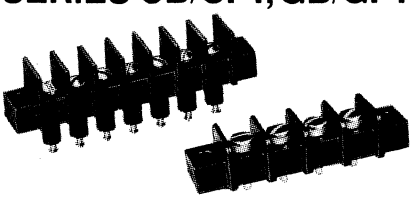
TERMINAL BLOCKS

SERIES 3700/3800



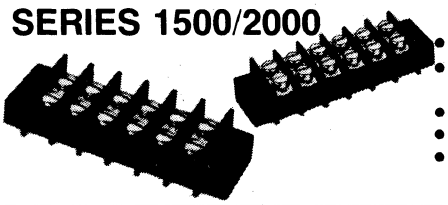
- Complete line of 3/8" centerline electronic terminal blocks in surface-mount, PC-mount, panel-mount, and feed-thru styles with a wide variety of top and bottom terminations.
- Compliant contact design virtually eliminates solder joint fractures due to pin twist.
- Molded-in stand-offs aid board cleaning by preventing trapped solder flux.
- Broad wire range — 22 to 12 AWG.
- All Curtis terminal blocks for electronic applications are made from self-extinguishing material rated 94V-0 by Underwriters Laboratories Inc.

SERIES CB/CFT, GB/GFT



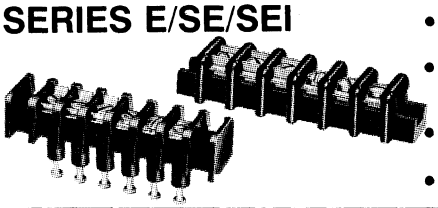
- Strong one-piece design featuring machined terminals molded into solid housing.
- Ideal for sub-chassis or thru-panel application. Requires no costly insulation or mounting set-up since feed-thru insulators are integral to the mouldings.
- Feed-thru, fully insulated feed-thru, disconnect, printed-circuit or surface-mount types.
- One thru 26 terminals on 3/8" (CB/CFT) or 7/16" (GB/GFT) center-to-center spacings; 20 amps/300 volts electrical rating.
- Broad wire range — 22 to 12 AWG.
- Durable base material — Black thermo-set phenolic or high-impact, break-resistant thermoplastic.

SERIES 1500/2000



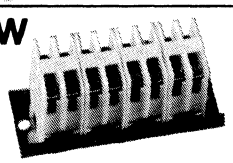
- Hi-temp, self-extinguishing thermoplastic blocks resist breakage and other damage.
- Terminal flexibility — Ideal for surface-mount, sub-panel or chassis connections in electronic/electrical circuit applications.
- One thru 22 terminals, 3/8" (1500) or 7/16" (2000) center-to-center spacings.
- Economical closed-back design eliminates need for costly insulation strip.
- Broad wire range — 22 to 10 AWG; rated 30 amps/300 volts.

SERIES E/SE/SEI



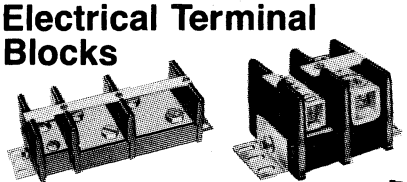
- Compact design especially suited for electronic control and low-power circuit applications up to 15 amps/300 volts.
- Feed-thru, printed circuit, or surface connection — One thru 22 terminals on 3/8" center-to-center spacing (Series E), one thru 26 terminals on 1/4" center-to-center spacing (SE/SEI).
- Barrier-type construction. Blocks are made of durable thermo-set phenolic or high-impact, break-resistant thermoplastic.
- Wire sizes: 22 to 16 AWG.

SERIES SW



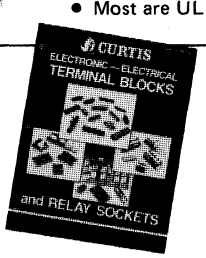
- Two and three-pole break-resistant nylon modules easily snap into track for fast assembly. Modules pop out for fast removal.
- 3/8" center-to-center terminals for dense circuitry.
- 32 poles per foot. Wire ranges from 22 to 8 AWG
- Ratings up to 50 amps/600 volts.
- UL recognized, CSA certified.

Electrical Terminal Blocks



- Broad selection of high quality, economical industrial electrical terminal blocks with current ratings to 250 amps, voltages to 600 volts.
- Will accommodate wire sizes from 22 AWG to 250 MCM.
- Surface mount or snap-in track modular assembly.
- Housing materials: Phenolic (150° C, 302° F), Polyphenylene Oxide (110° C, 230° F), Thermoplastic Polyester (140° C, 285° F), Polyamide (125° C, 257° F).
- Most are UL recognized, CSA certified.

Send for NEW 48-page terminal block and relay socket engineering manual.



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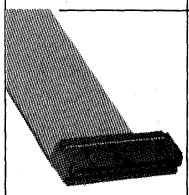
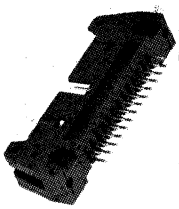
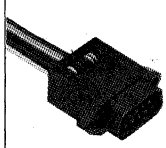
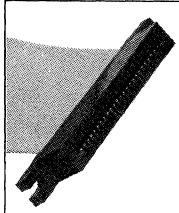
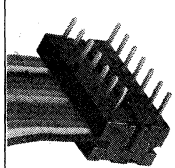
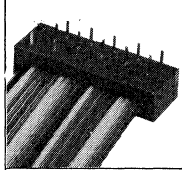
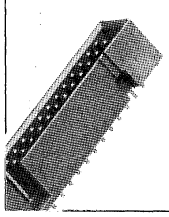
Milwaukee, Wisconsin 53218-0699
414/535-1500, Twx 910-262-3035, Fax 414/535-1150

Selection Guide to CW Insulation Displacement Connectors—Catalog C-2110-84

	Description	Features	No. of Contacts
	**Socket** Normally used to interconnect PC boards or points on a backplane through headers or pins on .100 in. × .100 in. spacing. Patented Torq-Tite™ contact for positive gas-tight cable termination. Nose end of contact provides superior wiping action and redundant electrical contact.	• Mil-C-83503/7 approved • Preassembled cover provides for precise, rapid assembly • Ridges on cover help align cable • Choice of polarizing method and optional strain relief strap	10, 14, 16, 20, 26, 34, 40, 50, 60
	**Headers** Fully shrouded or traditional design headers provide reliable mating interface for standard sockets having .100 in. × .100 in. contact spacing. Headers have pins on their mating side and offer the designer a choice of either wire-wrap or solder pins in various lengths in straight or right angle styles.	• Mil-C-83503/20, 21, 24, and 25 approved • Mateable with sockets from other manufacturers, with or without strain relief • Polarization ribs can be removed for use with non-polarized sockets • Easy ejection, and secure locking available with long or short latches	10, 14, 16, 20, 26, 34, 40, 50, 60
	**D-Subminiature** Ideal for input/output applications and inter-connecting electronic equipment. Interchangeable and mateable with other connectors that meet these standareds. Available in all-plastic or metal-face versions with optional EMI/RFI shield.	• Metal face D-sub qualified to Mil-C-24308 • Choice of 3-way strain relief • Accepts standard .050 in. conductor spacing cable without special cable preparation • Preassembled cover for precise, rapid assembly • Accepts jacketed and shielded cable without the need for a backshell	9, 15, 25, 37 with pin or socket contacts
	**Card Edge** Provides a fast means for connecting/disconnecting single, double-sided or multi-layer PC boards. Extra long cantilevered contact provides an extended self-cleaning, wiping action, and ensures positive connection to the board.	• Factor pre-assembled cover for fast assembly • Self-adjusting contact force adjusts for variations in PC board thickness • Full polarization capability • With or without mounting ears	10, 20, 26, 34, 40, 50
	**DIP** Used for rapid, permanent connection of ribbon cable to a PC board or when connect/disconnect capabilities are required. Mates with a standard DIP socket. Cover is factory preassembled to connector base to simplify handling and assembly of cable.	• Mil-C-83503/6 approved. • Sturdy, yet flexible terminal posts • No "bare shoulders" on the contact at the PC board interface • Optional strain relief strap is available	14, 16, 24, 40
	**PCB** Used when a permanent connection of flat cable to the PC board is required. Cable is terminated to the PCB plug to make a reliable gas-tight connection through use of Torq-Tite™ contacts. The connector's pins are then soldered to the board.	• Mil-C-83503/23 approved • No "bare shoulders" on the contact at the PC board interface • Integral strain-relief option available. • Cover lip available for cable end termination.	10, 20, 26, 34, 40, 50, 60
	**Low Profile Box Headers** Mate with all standard female sockets. Reduce height and board area by as much at 50%. Available in straight or right angle, solder or edgeboard pins.	• Polarization ribs can be removed for use with non-polarized sockets • Mateable with sockets from other manufacturers • Pin lengths for 1/16″ or 1/8″ PC boards	20, 26, 34, 40, 50

CW Insulation Displacement Connectors—Standards & Specifications

Specifications

- Contact Plating:

  30μ in. gold over
  50μ in. nickel, standard or

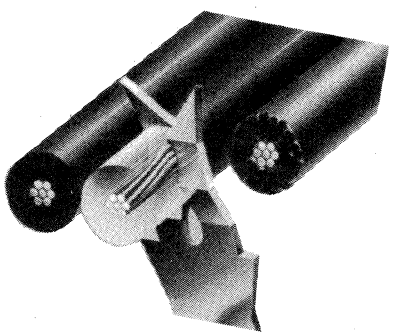
  10μ in. gold over
  50μ in. nickel, standard

  50μ in. gold over
  50μ in. nickel, for MIL-SPEC applications

  100μ in. tin-lead optional*

- Contacts: phosphor bronze, standard; bare CDA 725, optional
- Standard Contact Resistance 15 miliohms max.
- Dielectric Withstand Voltage: greater than 500 Vdc at sea level
- Current Rating: 1 amp (maximum) per contact
- Insulation Resistance: greater than 5×10^9 ohms
- Operating Temperature: –55°C to + 125°C
- Housing Material
  UL 94V-O flame-retardant thermoplastic
- Color: blue

*Tin-lead plating not available on header connectors. 100μ in. tin-lead is standard contact plating on PCB connectors.



Patented Torq-Tite™ Contact

Offset tines compress and grip conductor to form a gas tight connection impervious to environmental contaminants. Wiping action cleans conductor surface to provide metal to metal contact. The resultant force of the dual torques produces a longterm, Torq-Tile™ connection. The electrical connection on the other end—between the contact and its mate—whether it be a PC board, a pin or a socket, is of equal importance. Structural design, materials, area of contact, surface finish, contact redundancy, and mechanical means of seating the contact in the insulator can be critical. Every CW contact has been designed with full consideration of these factors.

CW Industries IDC Connector System

- We offer flat cable in various conductor sizes and types, including gray, color coded, jacketed and shielded
- Assembly press kits available with interchangeable dies for high speed termination of one or more types of CW IDC connectors
- Standard and custom cable assemblies available from factory or local CW value-added distributor
- UL, CSA
- Qualified to MIL-C-83503. Only metal face D-sub with MIL-C-24308 approval.

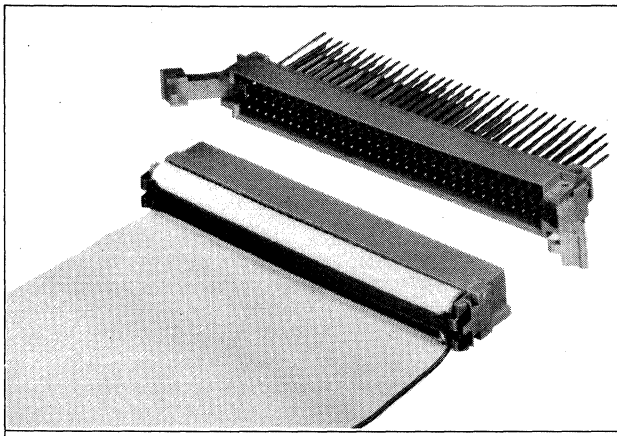
Ask for Catalog C-2110

Compatible to DIN Specification 41612

"American DIN" IDC Connector System

NEW!

- Compatible to DIN specification 41612
- 50% more I/O capability in the same space as standard DIN connectors
- Fast, reliable IDC termination
- Mass terminates 96 conductors on .100″ centers to .033″-centered flat cable
- Quick, easy, positive connections
- Drop-in replacement for standard DIN connectors
- Complete socket/header/cable system
- VA assemblies available
- Ejector latch system
- Compatible with standard Eurocard PC board systems



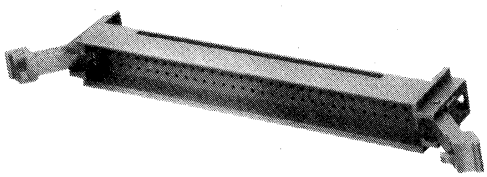
AMERICAN DIN HEADER CONNECTORS are available in solder and wire wrap pins in straight and right angle configurations. Ejector latches ensure easy insertion/withdrawal.

Pins are on .100″ DIN standard centers with three active rows of contacts.

Headers are drop in replacement for standard DIN connectors.

AMERICAN DIN SOCKET CONNECTORS mate with flat cable with .033″ centered spacing. 96 contacts in 3 active rows increase I/O capability to 50% more than standard DIN sockets.

American DIN sockets mate with all configuration types of 96 pin DIN headers.



AMERICAN DIN BACKPLANE SHROUD easily mounts to the backplane to provide pin protection and mateability to the American DIN socket. It can even be used with pre-designed backplanes.

Furnished as standard are the same latches as on the American DIN header.

SPECIFICATIONS

- Contacts: Ph Br, .025″ diameter (headers)
  Cu Alloy (sockets)
- Contact Plating: 30μ″ Au over 50μ″ Ni in mating area; 100μ″ SnPb for solder applications, gold flash for wire wrap applications (headers) 30μ″ Au (in mating area), over 50μ″ Ni selective-plated (sockets)
- Insulator Material: UL 94V-0 flame-retardant thermoplastic
- Strain Relief Strap Material: Insulated stainless steel
- Color: Blue
- Operating Temperature: –55°C to + 125°C
- Current Rating: 1A (maximum) per contact
- Dielectric Strength: Over 500 V.D.C. at sea level
- Insulation Resistance: Greater than 5×10^9 ohms

Flat Cable: CW offers flat cable on .033″ centers with 30 AWG solid and 32 AWG stranded conductors

Mounting Hardware: Mounting hardware kits featuring screws, nuts and washers are available for use with American DIN headers and backplane shrouds

Assembly Press Kit: CW offers an Assembly Press and special upper and lower dies for fast, easy termination of cable to socket—96 IDC conductors terminated in one step!

CW's American DIN connector system combines the best features of the traditional DIN with the growing need for high density connectors.

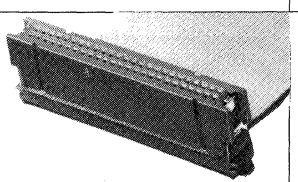
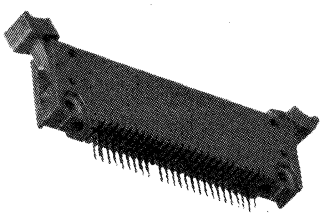
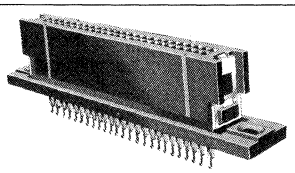
Contact CW to see how the American DIN can save PC board space, interconnection time, and money.

CW INDUSTRIES 130 James Way, Southampton, PA 18966 Tel. (215) 355-7080 Telex 83-1470 Fax 215-355-1088

NEW!

CW Nano .025" Microminiature Connector System

Complete family of minature connectors in 26 and 50 pin configurations, permit PC board layout on .050 × .050" grid. one-fourth the area, one eighth the volume of conventional IDC connectors.

	Description	Features
	**Nano Socket Connectors** are used to interconnect PC boards or points on a backplane through Nano headers or pins on .050" × .050" spacing. They mate with 30 AWG solid and 32 AWG stranded cable, extruded or laminated, on .025" centers.	• CW's patented Torq-Tite contact assures gas-tight connection • Pre-assembled cover for rapid, precise assembly • Polarization slots on both sides assures positive orientation
	**Nano Header Connectors** are most often permanently mounted to PC boards and mate with Nano Socket Connectors on .050" contact spacing. Available in both straight and right angle versions for vertical or horizontal mounting, Nano headers offer the designer a wide diversity of circuit design options, including solder pins in various lengths, wire-wrap posts, compliant pins, edgeboard contacts and surface mounting capability.	• Latches available as option; ensure easy ejection, secure fit • Polarization ribs on both sides for positive orientation • Available with solder, compliant, wire-wrapping, surface mount contacts
	**Nano Socket/Post Connectors** provide fast, simple and positive direct board-to-board connections without cable—providing unprecedented levels of packaging density. Posts are mounted on .050" × .100" centers, with the post array staggered to allow straight line PC board circuit layout.	• Mates with all Nano headers, both straight and right angle • Solder pin, edgecard, surface mount configurations available • Mounts directly to PC board on .050" × .100" centers

Materials and Operating Standards

- Copper Alloy
- Contact Plating: *Solder-pin style:* Duplex plated, 30μ" gold (in mating area) 100μ" Tin/Lead on solder pin, all over 50μ" nickel. *All other styles:* Selective plated, 30μ" gold (in mating area) over 50μ" nickel
- Insulator Material: UL 94V-0 flame retardant glass-reinforced thermoplastic*
- Color: Blue*
- Operating Temperature: –55°C to +125°C
- Current Rating: .5 amp per contact
- Dielectric Withstand Voltage: Greater than 500 Vdc at sea level
- Insulation Resistance: Greater than 5 × 10^3 ohms
- Withdrawal Force: 2 to 3 oz. per contact (typical)

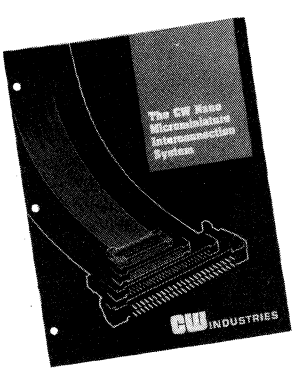
*Note: Surface mount connectors are UL 95V-0 flame retardant thermoplastic capable of withstanding vapor phase reflow soldering of 419°F. Color: Black.

HARDWARE MOUNTING OPTIONS

A wide variety of hardware mounting options is available from CW, either in kit form or factory pre-assembled.

EMI/RFI

CW offers metal shield enclosures and jacketed and shielded cable to ensure maximum shield integrity. These reduce radiated emissions far above level needed for conformance to FCC docket 20780.



Request CW Catalog C-2114 for more information about the Nano system, including .025" center cable, assembly tools, hardware, EMI/RFI shielding, surface mount connectors and test data.

CW INDUSTRIES 130 James Way, Southampton, PA 18966 Tel. (215) 355-7080 Telex 83-1470 Fax 215-355-1088

MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination.* This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float.* Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof.* May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card.* The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement.*

Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage.* Can be confused with the term used to describe how many times a connector may be mated and separated.

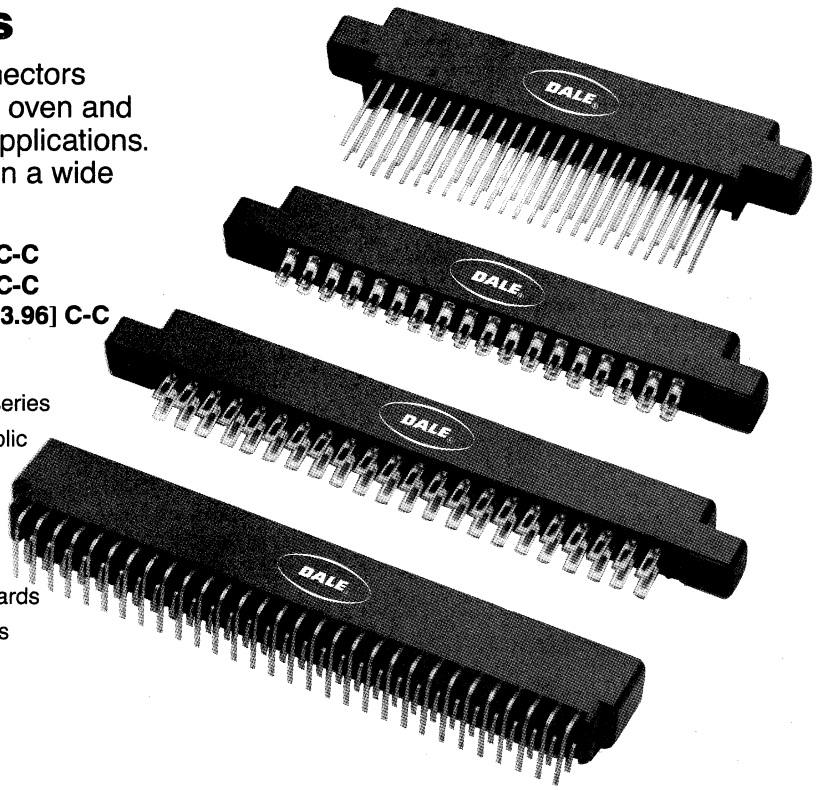
Withstanding voltage: Also called *test voltage.* The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

DUAL READOUT EDGEBOARD CONNECTORS

150°C and 200°C BURN-IN CONNECTORS

High temperature, long life connectors designed specifically for burn-in oven and automatic temperature testing applications. Priced affordably and available in a wide range of sizes.

SERIES EB4, .100 [2.54] C-C
SERIES EB6, .125 [3.17] C-C
SERIES EB7, EB8, .156 [3.96] C-C



FEATURES

- Right angle models now included for all series
- High temperature, glass reinforced phenolic connector bodies — 150°C
- High temperature, glass reinforced PPS connector bodies — 200°C
- High reliability spinodal alloy contacts
- Accepts standard .054-.071 thick P.C. boards
- High reliability bifurcated bellows contacts
- Gold-plated contacts
- Card extender style terminals standard
- Variety of mounting styles available
- Competitively priced
- **Recognized under the Component Program of Underwriters Laboratories Inc. Listed under File E65524.**

[Numbers in brackets indicate millimeters]

SPECIFICATIONS

Body Material: Fiberglass reinforced phenolic, 150°C operating temperature, flame-retardant (UL94V-O) — 150°C
Fiberglass reinforced polyphenylene sulfide, 200°C operating temperature, flame-retardant (UL94V-O) — 200°C

Contacts: Copper-nickel-tin spinodal alloy per ASTM B 740

Plating: Gold plating (.00003 min. thick), over .00005 min. nickel underplate

Current Rating: 5 amps

Test Voltage Between Contacts:
At sea level: 1800 VRMS At 70,000 feet: 450 VRMS

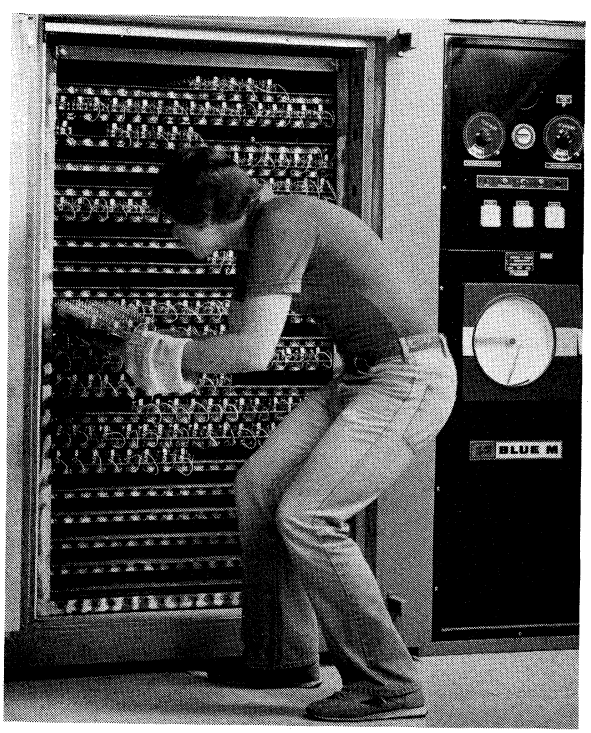
Insulation Resistance: 5,000 megohms min. at 500 VDC potential

Contact Resistance: 30 millivolts max. at rated current

Humidity: 48 hours at 95% relative humidity at 90°C, insulation resistance 5,000 megohms

Shock: 3,50G shocks in each of 3 mutually perpendicular planes with no loss of continuity

SPECIAL APPLICATION NOTE:
When operating units at elevated temperatures, solder having a melting point 50°C above the operating temperature should be used. Contact factory for specific solder information.



CONTACT: **DALE ELECTRONICS, INC.**
. . . a VISHAY Company
E. Hwy. 50, P.O. Box 180, Yankton, SD 57078-0180 • Phone (605) 665-9301

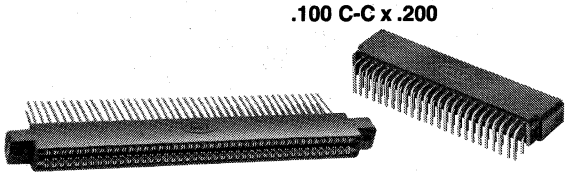
DALE® EDGEBOARD CONNECTORS

MODEL	SPACING	FEATURES

DUAL READOUT

EB4 (Standard) .100 C-C x .200

EB4 (Right Angle) .100 C-C x .150
.100 C-C x .200

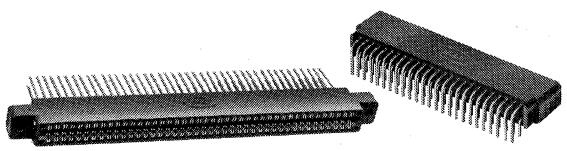


- Designed to meet MIL-C-21097/23 requirements
- Body materials: Diallyl phthlate, phenolic, glass-filled polyester
- Wide choice of contact terminations, body sizes and mounting styles
- Selective gold plating
- Accepts printed circuit board thickness from .054 [1.37] — .071 [1.80]
- Polarization between contact positions in all sizes.
- **Recognized under the Component Program of Underwriters Laboratories Inc. Listed under File E65524, Project 77CH3889.**

DUAL READOUT

EB6 (Standard) .125 C-C x .250

EB6 (Right Angle) .125 C-C x .150
.125 C-C x .200

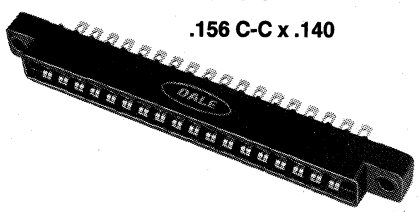


- Designed to meet MIL-C-21097/24 requirements
- Body materials: Diallyl phthlate, phenolic, glass-filled polyester
- Wide choice of contact terminations, body sizes and mounting styles
- Selective gold plating
- Accepts printed circuit board thickness from .054 [1.37] — .071 [1.80]
- Polarization between contact positions in all sizes.
- **Recognized under the Component Program of Underwriters Laboratories Inc. Listed under File E65524, Project 77CH3889.**

DUAL and SINGLE READOUT

EB7S .156 C-C

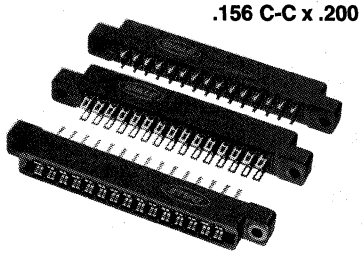
EB7D .156 C-C x .140



- Bifurcated bellows contacts
- Accepts printed circuit board thickness from .054 [1.37] — .071 [1.80]
- Polarization between contact positions in all sizes.
- Selective gold plating
- Polarizing key (reinforced nylon) inserts by hand. Requires no adhesive.
- Protected entry, straightens and aligns board to prevent contact damage.
- **Recognized under the Component Program of Underwriters Laboratories Inc. Listed under File E65524, Project 77CH3889.**

DUAL READOUT

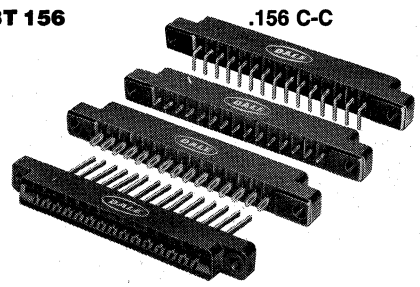
EB8 .156 C-C x .200



- Bifurcated bellows contacts
- Designed to meet MIL-C-21097 requirements
- Body materials: Diallyl phthlate, phenolic, glass-filled polyester
- Wide choice of contact terminations, body sizes and mounting styles
- Selective gold plating
- Accepts printed circuit board thickness from .054 [1.37] — .071 [1.80]
- Polarization between contact positions in all sizes.
- **Recognized under the Component Program of Underwriters Laboratories Inc. Listed under File E65524, Project 77CH3889.**

SINGLE READOUT

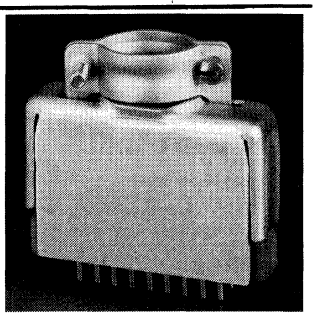
EBT 156 .156 C-C



- Modified tuning fork contacts have chamfered lead-in to reduce wear on board contacts
- Accepts printed circuit board thickness from .054 [1.37] — .070 [1.78]
- Polarization on or between contact positions in all sizes
- Polarizing key (reinforced nylon) inserts by hand. Requires no adhesive.
- Protected entry, straightens and aligns board to prevent contact damage
- Terminal configurations include eyelet, dip-solder and Wire Wrap™
- Meets or exceeds MIL-C-21097/6
- **Connectors with Type A, B, C, D or R contacts are recognized under the Component Program of Underwriters Laboratories Inc. Listed under File E65524, Project 77CH3889.**

CONTACT: DALE ELECTRONICS, INC.
• • • a VISHAY Company
E. Hwy. 50, P.O. Box 180, Yankton, SD 57078-0180 • Phone (605) 665-9301

MICROMINIATURE RECTANGULAR RACK AND PANEL CONNECTOR



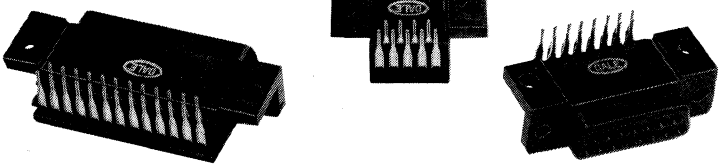
MODELS MM22 and MM24

With Optional Hoods

FEATURES

- Qualified to MIL-C-28748/7 and /8
- Solder cup contacts
- Dip solder contacts
- Fixed and turnable screwlocks
- Optional closed entry socket contacts
- No. of Contacts: 5, 7, 9, 11, 14, 18, 20, 26, 29, 34, 44 or 50

D-SUBMINIATURE RIGHT ANGLE PC MOUNT CONNECTOR



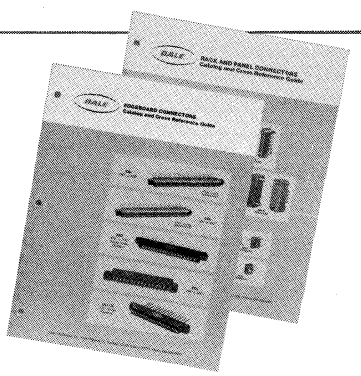
MODEL DS

FEATURES

- All plastic design with right angle terminals for economical PC board mount applications.
- Precision rigid terminals with precise spacing for easy board insertion.
- Selective gold plating placed in contact area only to minimize cost.
- 60/40 tin lead solder terminals provide excellent solderability for wave soldering applications.
- Mounting options to fit your particular application.
- Available in 9, 15, 25 and 37 contact positions.

GET INFORMATION ON DALE'S COMPLETE CONNECTOR LINE

Standard or special — Dale is ready with the fast service and extra design assistance you don't receive from other connector suppliers. The models shown on these pages represent only a few of the ways we can meet your connector needs. Contact us today for complete information including details on many *special application models* such as digital display, dip solder, test point, side mount, housed and umbilical styles. We're ready to send you our new EDGEBOARD CATALOG and our RACK AND PANEL CATALOG. Contact your nearest Dale representative from the list below or call the factory today.



CONTACT: **DALE ELECTRONICS, INC.** E. Hwy. 50, P.O. Box 180, Yankton, SD 57078-0180 • Phone (605) 665-9301
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DALE CUSTOMER REPRESENTATIVES CAN SOLVE YOUR CONNECTOR PROBLEMS

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- **AL** Huntsville (JWL Associates, Inc.) (205) 883-1712
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- **CA** Los Alamitos (Reed Electronic Marketing) (213) 598-6676
- **CA** Redwood City (James S. Heaton Co.) (415) 367-9000
- **CA** San Diego (Dale Sales Office) (619) 690-5112
- **CO** Colorado Springs (Dale Sales Office) (719) 593-7529
- **CO** Loveland (Dale Sales Office) (303) 667-7500
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- **DE** (See Pennsylvania)
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- **FL** Palm Beach Gardens (Graham Associates, Inc.) (407) 622-4049
- **FL** Melbourne (Graham Associates, Inc.) (407) 773-6631
- **FL** Winter Garden (Graham Associates, Inc.) (407) 656-9369
- **GA** Atlanta (JWL Associates, Inc.) (404) 320-7643
- **GA** Roswell (JWL Associates, Inc.) (404) 993-0100
- **ID** (See Colorado)
- **IL** Skokie (Industrial Rep., Inc.) (312) 967-8430
- **IN** Fort Wayne (Scott Electronics, Inc.) (219) 489-5690
- **IN** Indianapolis (Scott Electronics, Inc.) (317) 841-0010
- **IA** (See Illinois)
- **KS** Shawnee Mission (Dale Sales Office) (913) 432-9140
- **MD** Glen Burnie (Tri-Mark, Inc.) (301) 761-6000
- **MA** Wakefield (Howard C. Jappe Company) (617) 245-9359
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- **MO** (Western — See Kansas)
- **NJ** (Southern — See Pennsylvania)
- **NJ** (Northern) Fairlawn (Kaelber & Mack) (201) 797-7865
- **NM** (See Arizona)
- **NY** Commack (Kaelber & Mack) (516) 499-2924
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- **OH** Dayton (Scott Electronics, Inc.) (513) 294-0539
- **OH** Reynoldsburg (Scott Electronics, Inc.) (614) 863-1281
- **OK** (See Texas)
- **OR** Beaverton (LD Electronics) (503) 684-8221
- **PA** Horsham (TMI) (215) 441-4300
- **SC** (See North Carolina)
- **TN** (See North Carolina)
- **TX** Dallas (Edward F. Aymond Company) (214) 826-7620
- **TX** Houston (Edward F. Aymond Company) (713) 880-8229
- **TX** San Antonio (Edward F. Aymond Company) (512) 675-8339
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- **WA** Snohomish (LD Electronics) (206) 568-0511
- **WA** Spokane (LD Electronics) (509) 922-4883
- **WI** Milwaukee (Industrial Rep., Inc.) (414) 259-0965

CANADA: Scarborough, Ont. (Dale Electronics, Ltd.) (416) 759-5631
London, Ont. (Bach-Simpson, Ltd.) (519) 452-3200
Toronto, Ont. (Bach-Simpson, Ltd.) (416) 288-9932
Montreal, Que. (Bach-Simpson, Ltd.) (514) 331-6817

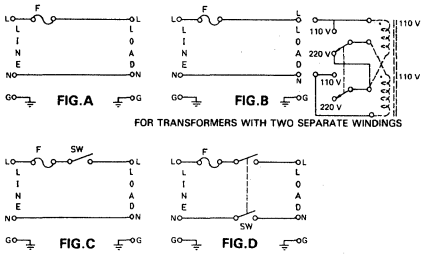
DELTA

A SERIES POWER ENTRY MODULES

INTRODUCTION

- A compact power module in plastic case that incorporates an IEC connector, a fuse holder, an optional power on/off switch and a voltage selector switch in one single, easy-to-install unit.
- Presents maximum flexibility, minimum space requirement and cost savings over individual components with no assembly cost for compact design and high volume production.
- Fuse holder designed for one IEC 5x20mm fuse and one spare fuse. Safety interlock prevents fuse removal with line plug inserted.
- All part numbers are UL recognized, CSA certified and VDE approved (VDE certificate No. 2107).

ELECTRICAL SCHEMATIC



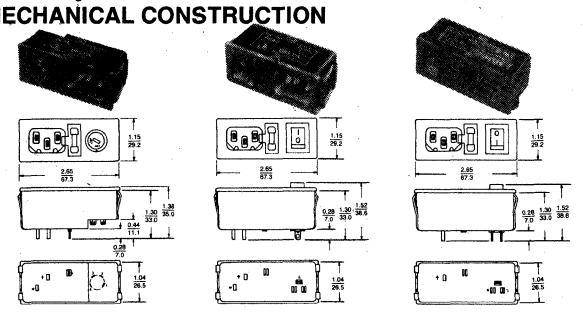
TYPES & RATED CURRENT

Delta Part No.		06A1	06A2	06A2D	06A5
Rated Current	115VAC	6A	6A	6A	6A
	250VAC	6A	6A	4A	6A
IEC Connector		△	△	△	△
Fuse Holder		△	△	△	△
Power Switch		—	SP[1]	DP[1]	—
Voltage Selector SW		—	—	—	FRONT[3]
Electrical Schematic		FIG. A	C	D	B

SPECIFICATIONS

Maximum Leakage Current Each
Line-To-Ground @ 115VAC 60Hz:2μA
@ 250VAC 50Hz:5μA
Hipot Rating (One Minute)
Line-To-Ground: 2250VDC
Line-To-Line: 1450VDC
Operating Frequency: 48-440Hz
Rated Voltage: 115/250VAC

MECHANICAL CONSTRUCTION



06A5
06A1 (WITHOUT VOLTAGE SELECTOR SW)
06A2
06A2D
Unit: inch / mm

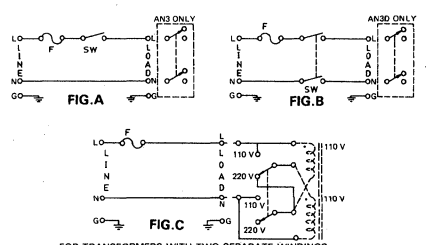
1. Single Pole: UL, CSA & VDE approved
   Current Rating: UL & CSA- 6A both at 125 VAC & 250VAC VDE- 6A/250VAC
   Electrical Life Time: 50,000 Ccycles
   Maximum In-Rush Current: 24A
2. Double Pole: UL, CSA & VDE approved
   Current Rating: UL & CSA- 6A/125VAC 4A/250VAC VDE- 4A/250VAC
   Electrical Life Time: 10,000 cycles
   Maximum In-Rush Current: 51A
3. Voltage Selector SW: UL, CSA & VDE approved
   Current Rating: UL & CSA- 6A both at 125 VAC & 250VAC VDE- 6A at 250VAC

AN SERIES POWER ENTRY MODULES

INTRODUCTION

- A compact power module in metal case that incorporates an IEC connector, a fuse holder, an optional power on/off switch and a voltage selector switch in one single, easy-to-install unit.
- Due to compact design and high volume production, this series presents maximum flexibility, minimum space requirement and cost savings over individual components with no assembly cost.
- Fuse holder designed for one IEC 5x20mm fuse and one spare fuse. Safety interlock prevents fuse removal with line plug inserted.
- All part numbers are UL recognized, CSA certified and VDE approved (VDE certificate No. 2107).

ELECTRICAL SCHEMATIC



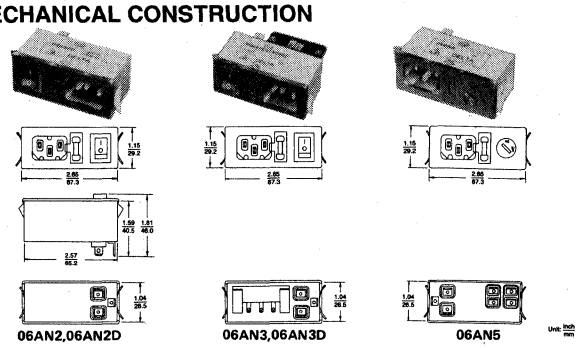
TYPES & RATED CURRENT

Delta Part No.		06AN2	06AN2D	06AN3	06AN3D	06AN5
Rated Current	115VAC	6A	6A	6A	6A	6A
	250VAC	6A	4A	5A	4A	6A
IEC Connector		△	△	△	△	△
Fuse Holder		△	△	△	△	△
Power Switch		SP[1]	DP[2]	SP[1]	DP[2]	—
Voltage Selector SW		—	—	REAR[3]	REAR[3]	FRONT[4]
Electrical Schematic		FIG. A	B	A	B	C

SPECIFICATIONS

Maximum Leakage Current Each
Line-To-Ground @ 115VAC 60Hz:2μA
@ 250VAC 50Hz:5μA
Hipot Rating (One Minute)
Line-To-Ground: 2250VDC
Line-To-Line: 1450VDC
Operating Frequency: 48-440Hz
Rated Voltage: 115/250VAC

MECHANICAL CONSTRUCTION



06AN2,06AN2D
06AN3,06AN3D
06AN5
Unit: inch / mm

1. Single Pole: UL, CSA & VDE approved
   Current Rating: UL & CSA- 6A both at 125 VAC & 250VAC VDE- 6A/250VAC
   Electrical Life Time: 50,000 Ccycles
   Maximum In-Rush Current: 24A
2. Double Pole: UL, CSA & VDE approved
   Current Rating: UL & CSA- 6A/125VAC 4A/250VAC VDE- 4A/250VAC
   Electrical Life Time: 10,000 cycles
   Maximum In-Rush Current: 51A
3. Voltage Selector SW: UL, CSA & VDE approved
   Current Rating: UL & CSA- 6A both at 125 VAC & 250VAC VDE- 6A at 250VAC

DELTA

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TAIPEI, TAIWAN, R.O.C.
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TELEFAX: (2) 7169764

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C SERIES POWER ENTRY MODULES

INTRODUCTION

- Power module incorporates an IEC connector, double fuse (IEC 5x20) holder, optional voltage selector switch and double pole power switch, all in one easy-to-install unit.
- Adapts to 100-120V or 200-240V input voltage simply by reversing the fuse holder.
- Compact design and high volume production provide maximum flexibility and significant savings in space and cost over assembly of individual components.
- All part numbers are UL recognized and CSA certified and VDE approved.

ELECTRICAL SCHEMATIC

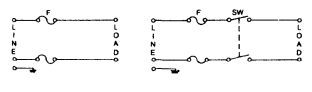


FIG. A

FIG. B

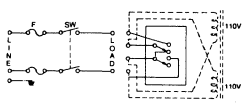


FIG. C

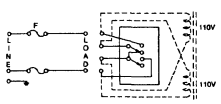


FIG. D

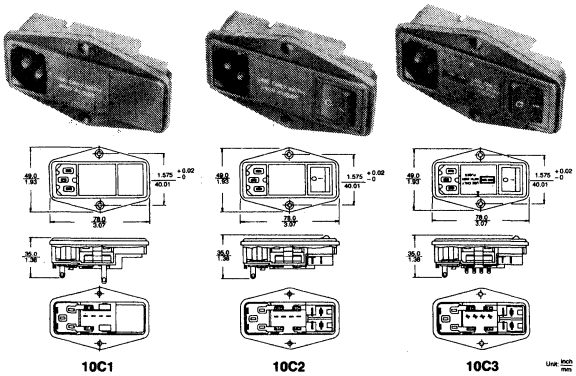
TYPES & RATED CURRENT

Delta Part No.		10C1	10C2	10C3	10C4
Rated Current	115VAC	10A	10A	10A	10A
	250VAC	10A	10A	10A	10A
IEC Connector		△	△	△	△
Fuse Holder		△	△	△	△
Double Pole Power Switch*		—	△	△	—
Voltage Selector Switch**		—	—	△	△
Electrical Schematic		A	B	C	D

SPECIFICATIONS

Current Rating: 250V 6Amps
: 115V 10 Amps
Hipot Rating (One Minute)
Line-To-Ground: 2250VDC
Line-To-Line: 1450VDC
Operating Frequency: 50-60 Hz
Rated Voltage: 100-120VAC/200-240VAC

MECHANICAL CONSTRUCTION



10C1 10C2 10C3

Unit: inch/mm

* UL, CSA & VDE approved
CURRENT RATING: UL & CSA- 6A/125VAC, 4A/250VAC; VDE-4A/250VAC.
ELECTRICAL LIFE TIME: 50,000 cycles
MAXIMUM IN-RUSH CURRENT: 51A

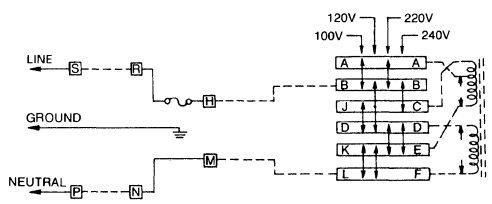
** UL, CSA & VDE approved
CURRENT RATING: UL & CSA- 10A both at 125VAC & 250VAC,
VDE-6A/250VAC

L SERIES POWER ENTRY MODULES

INTRODUCTION

- Power module incorporates an IEC connector, a single fuse (IEC 0.25″x1.25″ fuse) holder, and voltage selector switch, all in one easy-to-install unit.
- Adapts to 100-120V or 200-240V input voltage simply by reversing the voltage selector.
- Fuse puller design enables easy change of fuse.
- The fuse holder is designed for one IEC 6.3x32mm fuse. Safety device prevents fuse removal with line plug inserted.
- Compact design and high volume production provide maximum flexibility and significant savings in space and cost over assembly of individual components.
- All part numbers are UL approved, CSA certified and VDE approved.

ELECTRICAL SCHEMATIC



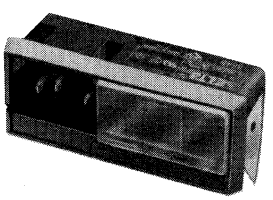
TYPES & RATED CURRENT

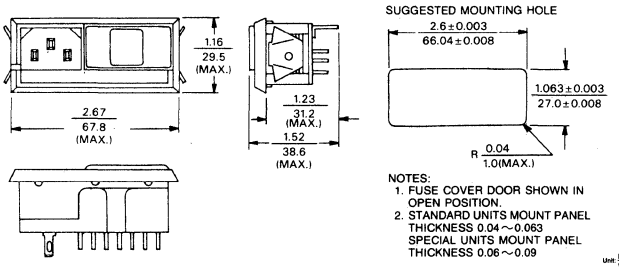
Delta Part No.		06L4
Rated Current	115VAC	6A
	250VAC	6A
IEC Connector		△
Fuse Holder		△
Voltage Selector Switch*		△

SPECIFICATIONS

Current Rating: 6Amps AC Max.
Hipot Rating (One Minute)
Line-To-Ground: 2250VDC
Line-To-Line: 1450VDC
Operating Frequency: 50-60Hz
Rated Voltage: 100-120VAC/200-240VAC

MECHANICAL CONSTRUCTION





NOTES:
1. FUSE COVER DOOR SHOWN IN OPEN POSITION.
2. STANDARD UNITS MOUNT PANEL THICKNESS 0.04～0.063
SPECIAL UNITS MOUNT PANEL THICKNESS 0.06～0.09

Unit: inch/mm

* UL, CSA & VDE approved, Current Rating: UL-15 & CSA-6A both at 125VAC & 250VAC; VDE-6A/250VAC

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TELEFAX: (716) 924-9851

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DELTA ELECTRONIC AG
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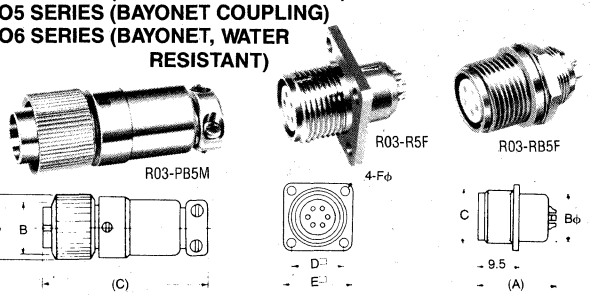
TELEFAX: (2) 7169764

T.M.W QUALITY CONNECTORS of *TAJIMI*/DSA

MINIATURE CIRCULAR CONNECTORS — Vibration, Moisture, Corrosion resistance: MIL-C-STD-202E.

RO3 SERIES (THREADED COUPLING)
RO5 SERIES (BAYONET COUPLING)
RO6 SERIES (BAYONET, WATER RESISTANT)

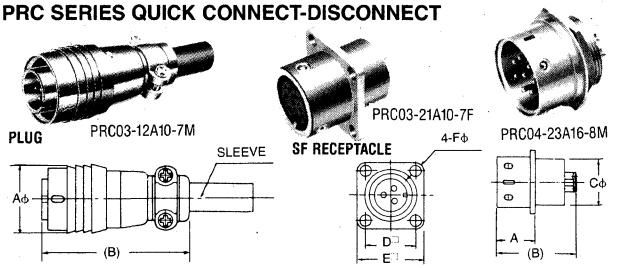


RO1, RO3, RO5 and RO6 series multipin circular connectors are small in size and high in reliability. Suitable for miniature and high density electronics equipment. RO1 (Threaded coupling) and RO6 (Bayonet coupling) series are water resistant and designed for application in Mobilradios and outdoor small electronics equipment.

Material: Shell is brass & zinc alloy, nickel plated. Contacts: copper alloy, gold plated (Nickel based).

No. of Contacts	A	B	C	Cable O.D.	A	B	C	D	E	F
2, 3, 5	12.0	M10.5P=0.75	32.0	5.2	18.0	9.0	M10.5P=0.75	10.5	15.0	2.2
6, 8	15.5	M14P=1	34.0	6.2	18.0	12.0	M14P=1	13.0	17.5	2.2
12	20.0	M18P=1	39.0	10.5	18.0	16.0	M18P=1	17.0	22.5	2.8

PRC SERIES QUICK CONNECT-DISCONNECT



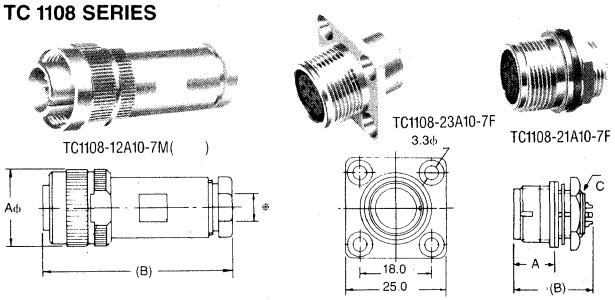
PRC03, 04 and 05 series are quick release, lightweight, miniature multipin connectors with audible lock mechanism, and are also free of vibration and impact problems.

Material & Plating: PRC05. Brass-Nickel, PRC03. Zinc Alloy-Nickel, PRC04. Aluminum A/O coating.

Series	Plug No. of Contacts	Plug A	Plug B	Plug Cable O.D.	SF & BH Receptacle A	SF & BH Receptacle B	SF & BH Receptacle C	SF & BH Receptacle D	SF & BH Receptacle E	SF & BH Receptacle F
PRC03	2, 3, 4, 5, 7	21.0	46.0	10.5	12.5	26.5	15.0	16.0	21.0	2.9
PRC04	8, 14	28.0	55.5	12.5	13.5	25.5	21.0	21.5	28.0	3.4
	12, 19	34.0	63.5	14.5	14.0	26.0	26.0	26.0	33.0	3.9
	21, 37	41.0	71.0	18.0	14.0	26.0	32.0	31.0	38.0	3.9
PRC05	2, 3, 5	13.5	32.0	5.2	9.5	18.0	9.0	11.5	16.0	2.2
	6, 8	16.7	34.0	6.2	9.5	18.0	12.0	13.5	18.0	2.2
	12	21.0	39.0	10.5	9.5	18.0	16.0	17.0	22.5	2.8

WATERPROOF CIRCULAR CONNECTORS — Vibration, Moisture, Corrosion resistance: MIL-C-STD-202E.

TC 1108 SERIES



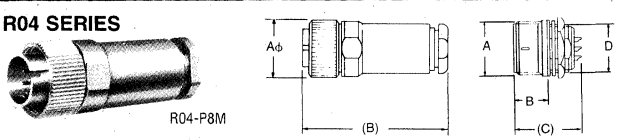
Tajimi TC1108 series connectors are waterproof up to 30 meters in depth. Economical and highly reliable construction also provides for applications in high humidity conditions. Hermetically sealed receptacles (Glass-to-Metal seal and Ceramic seal) are also available. Its applications are for vacuum pumps, inert gas tanks and oil pressure pumps.

Material & Plating: Brass-Nickel. Contacts: Copper Alloy-Gold (Nickel based).

Shell Size	No. of Contacts	A	B	Back-Nut I.D.* C	Mounting Hole Dia.	Receptacle Bulk Head A	Receptacle Bulk Head B	Receptacle Bulk Head C
10	2, 3, 4, 5, 7	21	52	5.2, 6.3, 7.0 8.0, 8.6, 10.0	14.2	12.5	26.0	M15
16	8 14	27	55.5	11.1/11.8/13.5 11.0/14.3/15.8	20.2	12.5	26.0	21.0
20	12, 19	34	61	11.0/14.3/15.8	25.2	13.5	26.0	26.0
26	21, 37	40	65	16.3	31.2	13.5	26.0	32.0

*Select most suitable I.D. for cable outer diameter.

R04 SERIES



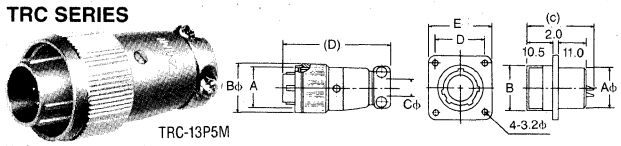
Tajimi R04 series connectors are miniature and waterproof up to 20 meters in depth. Its superior quality and small size offer design flexibility for a wide variety of applications including those for small electronics instruments and electromechanical devices which operate under high humidity conditions. Also available: Hermetically sealed receptacles (Glass-to-Metal seal and Ceramic seal).

Material & Plating: Brass-Nickel. Contacts: Copper Alloy-Gold (Nickel based).

No. of Contacts	A	B	Cable O.D.	A	B	C	D
2, 3, 5	12.0	38	4.8ϕ	M10.5P=0.75	9.0	18.0	M9.0P=0.5
6, 8	15.5	40	6.3ϕ, 6.8ϕ, 7.3ϕ	M14.0P=1	9.0	18.0	M12.0P=0.8
12	20.0	42	8.5ϕ	M18P=1	9.0	18.0	M16P=1

GENERAL PURPOSE CONNECTORS

TRC SERIES



TRC series is specifically designed for high reliability, economical construction for general purpose electronics applications.

Shell size	No. of Contacts	A Thread	B	C	D	A	B Thread	D	E
13	3, 5	M18P=1	21.5	8.5	46.0	16	M18P=1	20	26
16	7, 10	M22P=1	25.5	12.0	49.0	20	M22P=1	23	29
21	10, 16	M26P=1	29.5	14.5	53.0	24	M26P=1	26	32
25	16, 24	M30P=1	33.5	17.5	56.0	28	M30P=1	29	35

SPECIFICATIONS FOR ALL SERIES

Series	R01, R03, R04, R05, PRC05			PRC03, TC1108				PRC04 & TC1108				
Contacts	2, 3, 6	5	8	2	3	4	5, 7	8, 12	14	19	21	37
Current rating	2A	2A	2A	10A	10A	5A	5A	10A	5A	4A	10A	3A
Voltage rating (AC Vrms)	300	150	200	600	350	400	350	400	350	400	400	400
Withstanding Voltage (AC Vrms)	900	500	700	1800	1000	1200	1000	1200	1000	1200	1200	1200

Series	R01, R03, R04, R05, PRC05			PRC03, TC1108				PRC04 & TC1108				
Applicable wire	22	22	22	16	16	20	20	16	20	20	16	20
Contact resistance	DC3V 1A 5m max.											
Insulation resistance	DC500V 1000 M min.											
Temperature range	– 25 C +85 C											

Inline connector (JACK) is available for all series.
DSA offers a complete line of Tajimi connectors including RF Coaxial, Triaxial, Sub-miniature Coaxial.
For more information please call: 212-691-9050

SEE DSA PAGE IN EEM-SECTION 5100.

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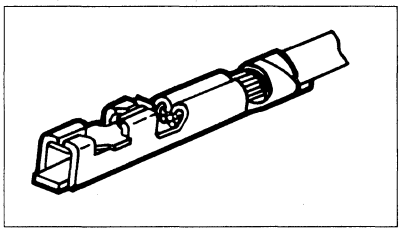
DSA INC. **Dai-Ichi Shoji of America, Inc.**
150 Fifth Avenue, Suite 845, New York, NY 10011 **FAX 212-807-1598**

DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

PV™ Dual-Metal Female Receptacles

The Du Pont PV dual-metal receptacle provides unsurpassed mechanical and electrical performance. Its two-piece design offers durability and reliability. The spring withstands repeated insertions and withdrawals, all the while maintaining constant mechanical pressure on the pins. Excellent electrical conductivity is attained by the high normal force of the receptacle. The wiping action between the contact area and the mating pin cleans the contact surfaces of oxides during insertion and withdrawal. The PV line offers wide design flexibility. There is a choice of three spring thicknesses to help meet specific insertion/withdrawal force requirements. There are four terminal variations in crimp-to-wire sizes from 18 to 36 AWG, and a choice of several gold or tin/lead platings. A complete line of application equipment provides optimum assembly capability for varying production needs.



Mini PV Receptacle

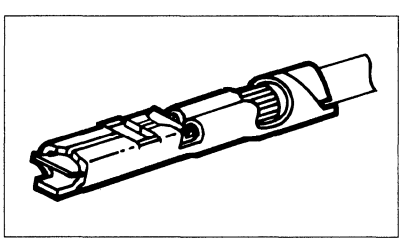
Body Material: 1/4 hard brass. *Body Plating:* 15, 30 or 40 μ in. gold over 50 μ in. nickel in contact area with gold flash on remainder of contact: 100 μ in. tin/lead over 30 μ in. copper in contact area with 50 μ in. tin/lead over remainder of contact. *Spring Material:* Heat-treated beryllium copper. *Spring Plating:* Gold flash or 30 μ in/tin. *Spring Thickness*: 0.0035, 0.0048, or 0.0065 in. *Current Rating:* 3 A cont. *Contact Resistance:* 5 milliohms.

Application Information

Mates To: 0.025" round or square pin or 0.028" round pin. *Pin Length:* for Discrete Application—0.200" nominal: For Housing Application—0.230" nominal. *Spring Thicknesses:* 0.0035" for use in 40–72 position Mini Latch Housing; 0.0048" for use in 10–50 position Mini Latch Housing; 0.0065" for use in 2–20 position Mini Latch Housing.

AWG Wire Size	Spring Thickness	Du Pont Number			
		Strip Form		Loose-Piece	
		30 μ in./Gold	Tin/Lead	40 μ in./Gold	Tin/Lead
18, 20 or Two 22 or Two 24	.0035"	48231-000	75374-035	75374-018	75374-036
	.0048"	48047-000	75374-033	75374-016	75374-034
	.0065"	48052-000	75374-031	75374-014	75374-032
22, 24, 26 or Two 26 or Two 28	.0035"	48049-000	75374-023	75374-006	75374-024
	.0048"	48046-000	75374-021	75374-004	75374-022
	.0065"	48051-000	75374-019	75374-002	75374-020
28, 30, 32 or Two 30 or Two 32	.0035"	48048-000*	75374-029	75374-012	75374-030
	.0048"	48045-000*	75374-027	75374-010	75374-028
	.0065"	48050-000*	75374-025	75374-008	75374-026

**UL approved*



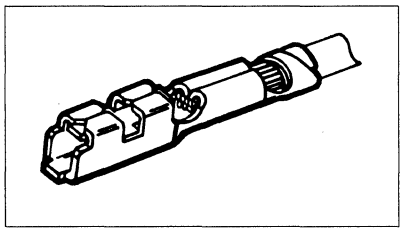
Maxi PV Receptacle

Body Material: 1/4 hard brass. *Body Plating:* 40 μ in. gold over 50 μ in. nickel in contact area with gold flash over remainder of contact: 100 μ in. tin/lead over 30 μ in. copper in contact area with 50 μ in. tin/lead over remainder of contact. *Spring Material:* Heat-treated beryllium copper. *Spring Plating:* Gold flash or 30 μ in. tin. *Spring Thickness:* 0.005, 0.006, 0.008". *Current Rating:* 5 A cont. *Contact Resistance:* 4 milliohms.

Application Information

Mates To: 0.025" round or square pin. *Pin Length:* For Discrete Application—0.230" nominal; For Housing Application—0.220" nominal. *Spring Thicknesses:* 0.005" for use in 12–56 position Maxi Latch Housing; 0.006" for use in 10–40 position Maxi Latch Housing; 0.008" for use in 2–12 position Maxi Latch Housing.

AWG Wire Size	Spring Thickness	Du Pont Number			
		Strip Form		Loose-Piece	
		40 μ in./Gold	Tin/Lead	40 μ in./Gold	Tin/Lead
18, 20 or Two 22 or Two 24	.005"	46226-000	47736-000	46227-000	46582-000
	.006"	46221-000	47388-000	46225-000	47391-000
	.008"	46223-000	46580-000	47387-000	46581-000
22, 24, 26 or Two 26 or Two 28	.005"	46236-000	47737-000	46237-000	46592-000
	.006"	46231-000	47389-000	46235-000	47392-000
	.008"	46233-000	46590-000	47384-000	46591-000
28, 30, 32 or Two 30 or Two 32	.005"	46246-000	47738-000	46247-000	46602-000
	006"	46241-000	47390-000	46245-000	47393-000
	.008"	46243-000	46600-000	47403-000	46601-000



Jumbo PV Receptacle

Body Material: 1/4 hard brass. *Body plating:* 40 μ in. gold over 50 μ in. nickel in contact area with gold flash on remainder of contact: 100 μ in. tin/lead over 30 μ in. copper in contact area with 50 μ in. tin/lead over remainder of contact. *Spring Material:* Heat-treated beryllium copper. *Spring Plating:* Gold flash or 30 μ in. tin. *Spring thickness:* 0.065". *Current Rating:* 7 A cont. *Contact Resistance:* 1.5 milliohms.

Application Information

Mates To: 0.040–0.045" round or square pin. *Pin Length:* For Discrete Application—0.235" nominal; For Housing Application—0.266" nominal.

AWG Wire Size	Spring Thickness	Du Pont Number			
		Strip Form		Loose-Piece	
		40 μ in./Gold	Tin/Lead	40 μ in./Gold	Tin/Lead
18, 20 or Two 22 or Two 24	.040"	75369-003	75369-006	75186-003	75186-006
	.045"	75375-003	75375-006	75187-003	75187-006
22, 24, 26 or Two 26 or Two 28	.040"	75369-002	75369-005	75186-002	75186-005
	.045"	75375-002	75375-005	75187-002	75187-005
28, 30, 32 or Two 30 or Two 32	.040"	75369-001	75369-004	75186-001	75186-004
	.045"	75375-001	75375-004	75187-001	75187-004

Crimp-to-Wire Male Pins

The Crimp-to-Wire Male Pin eliminates the need for a printed circuit board interface by mating with the Mini PV receptacle in a flying connection. It also fits all Mini Latch housings, so no special housing is necessary. The Male pin is available in gold or tin/lead platings. *Material:* 3/4 hard brass. *Plating:* 50 μ in. gold over 50 μ in. nickel in contact area with gold flash on remainder of contact. 100 μ in. tin/lead over 30 μ in. copper in contact area with 50 μ in. tin/lead over remainder of contact. *Current Rating:* 3 A cont. when mated to Mini PV Receptacle. *Contact Resistance:* 5 milliohms when mated to Mini PV Receptacle.

Application Information

Mates To: Female receptacles accepting 0.025" square pins 0.230" in length.

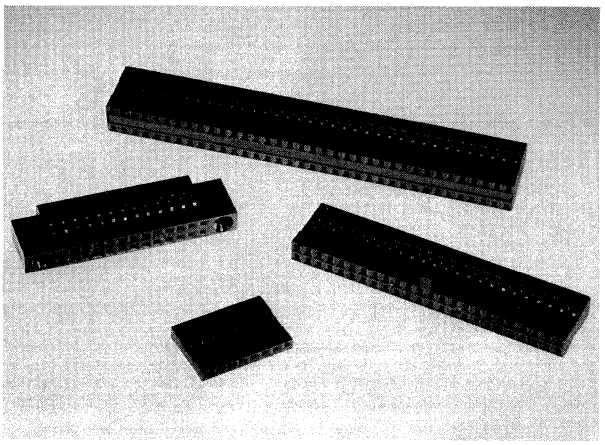
AWG Wire Size	Du Pont Number			
	Strip Form		Loose-Piece	
	40 μ in./Gold	Tin/Lead	40 μ in./Gold	Tin/Lead
18, 20 or Two 22 or Two 24	47793-000	75653-003	48117-000	75654-003
	47793-003*	75673-006*		
22, 24, 26 or Two 26 or Two 28	47792-000	75653-002	48116-000	75654-002
	47792-003*	75653-005*		
28, 30, 32 or Two 30 or Two 32	47791-000	75653-001	48115-000	75654-001
	47791-003*	75653-004*		

**For use with Olympian Model 700 and Model 740 machines only.*

DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

Latch Housings



Latch Housings eliminate the need to make individual connections by providing simultaneous connection of up to 72 PV™ Female Receptacles, shown on the previous page. The PV is retained in the housing by a patented latching mechanism which also permits receptacle removal with a simple tool and without damage to the contact or the housing. Once the PV is released, the latch returns to its original position. The latch housings allow for a variety of design applications. They are available in single- and double-row configurations on various grids, and most are stackable end-to-end and row-to-row. The Mini Latch housing offers the option of a molded-on polarizing feature to ensure the correct orientation of the female connector to the header without loss of a pin position. A bulkhead housing option is also available on the Mini Latch housing to assure a reliable mechanical latch in a flying connection.

Mini Latch Housing

Housing Material: Black polyphenylene oxide-based resin per MIL-P-46129 (MR), UL94V-1. *Polarizing Plug Material:* White Nylon, type 6-6. *Position Spacings:* Available on 0.100"; 0.125", 0.150", and 0.156" centers. *Dielectric Withstanding Voltage:* 1000 Volts, rms. *Operating Temperature Range:* –40°C to +105°C.

Application Information

To be used with Mini PV receptacles and Crimp-to-Wire male pins crimped to #22–36 AWG wire with maximum insulation diameter of 0.060". *Recommended Pin Length:* 0.230" nominal.

Maxi Latch Housing

Housing Material: Black polyphenylene oxide-based resin per MIL-P-46129 (MR), UL94V-1. *Position Spacing:* 0.125" on centers. *Dielectric Withstanding Voltage:* 1000 Volts, rms. *Operating Temperature Range:* –40°C to +105°C.

Application Information

To be used with Maxi PV receptacles crimped to #20–32 AWG wire with maximum insulation diameter .080". *Recommended Pin Length:* 0.270" nominal.

Jumbo Latch Housing

Housing Material: Black polyphenylene oxide-based resin per MIL-P-46129 (MR), UL94V-1. Position Spacing: 0.200" on centers. *Dielectric Withstanding Voltage:* 1000 Volts, rms. *Operating Temperature Range:* –40°C to +105°C.

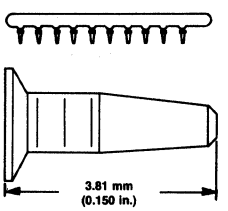
Application Information

To be used with Jumbo PC receptacle crimped to #20–32 AWG wire with maximum insulation diameter of 0.082". *Recommended Pin Length:* 0.266" nominal.

Accessories

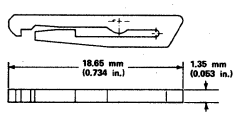
Polarizing Plug for Mini and Maxi Latch Housings

Du Pont Number 65307-001
Material: White Nylon, UL94V-0.
Temperature Range: –40°C to +105°C.



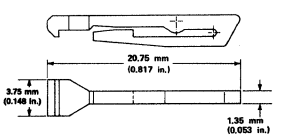
Polarizing/Latching Key for Latching Mini Latch Housing to a Vertical BergStik® Header

Du Pont Number 65166-001
Material: Blue Thermoplastic polyester, UL94V-0.
Temperature Range: –40°C to +105°C.



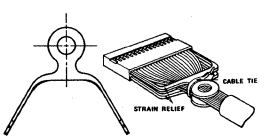
Polarizing/Latching Key for Latching Mini Latch Housing to a Right-Angle BergStik® Header

Du Pont Number 65167-001
Material: Blue thermoplastic polyester, UL94V-0.
Temperature Range: –40°C to +105°C.



Strain Relief for Mini Latch Housing

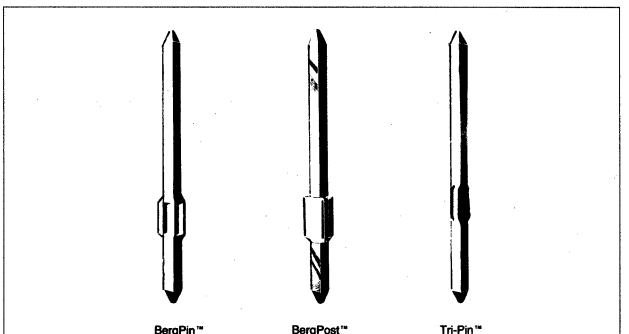
Material: Blue Nylon, UL94V-0.
Temperature Range: –40°C to +105°C.



Du Pont Number	Housing Size		
	0.100" Centers	0.125" Centers	0.150" Centers
65921-001	6–25 pos.	5–20 pos.	4–17 pos.
65921-002	22–36 pos.	18–32 pos.	15–27 pos.

0.025" Square Male Terminals

The 0.025" square terminals are manufactured from drawn wire to provide smooth contact surfaces with 0.002" max. radii that ensure a superior electrical connection. The smooth pin surfaces are easily wiped of oxides when mated to a standard female receptacle in disconnect applications. The sharp corners provided by the drawn-wire process are excellent wire-wrapping points and provide a gas-tight connection. A variety of male pins is available. The BergPin™ 0.025" square male disconnect has a star-shaped wedge at the area of board staking for superior retention in a 0.032" diam. hole. The TriPin™ 0.025" square male disconnect has a tri-area spring action section for press fitting in a 0.039" diam. hole in a 0.125" printed circuit board. The BergPost™ 0.025" square male disconnect has a ferrule for superior staking retention in a 0.049" diam. hole in a 0.0625" printed circuit board. All are available in different lengths for different PC board applications. Three staking machines are available to meet specific production requirements. Models range from a standard semi-automatic unit to a numerically controlled machine that stakes up to 12,000 pins per hour.

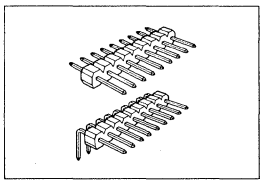


Choose from these Pin Types

DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

BergStik® II Headers



Features:

- Can be manually broken to the desired length.
- Drawn 0,64 mm (0.025 in.) square wire presents 4 quality surfaces suitable for wire wrapping.
- Standoffs allow cleaning to eliminate soldering contaminates.
- Optional retention tail provides 0.5 lb minimum retention prior to soldering on 0.062 in. thick PC boards.

Technical Data:

Spacing:	2,54 mm (0.100 in.) and 2,54 x 2,54 mm (0.100 x 0.100 in.)
Polarization:	By omitting a pin
Body:	
Material	Glass-filled nylon (UL94V-0). Color black
Insulation Resistance	5000 M Ω min.
Temperature Range	–65°C to + 105°C
Withstanding Voltage	1500V rms (sea level)
PIN:	
Material	Phosphor bronze
Finish	Gold, tin/lead or GXT™ (see "Ordering Data")
Current Rating	5A max.
Retention Force to Body	8.9 N (2 lb.) in either direction

Plating:

1 is 0,76 µm (30 µ in.) Gold over 1,27 µm (50 µ in.) Nickel.

2 is 0,38 µm (15 µ in.) Gold over 1,27 µm (50 µ in.) Nickel.

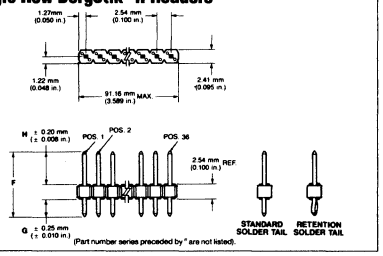
3 is 1,27 µm (50 µ in.) Gold over 1,27 µm (50 µ in.) Nickel.

4 is 3,81 µm (150 µ in.) 9/37 Tin/Lead.

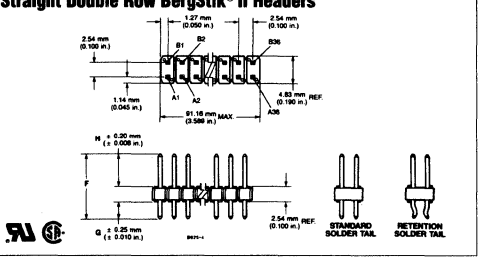
5 is 0,38 µm (15 µ in.) GXT™ Palladium-Nickel Alloy w/Gold Flash over 1,27 µm (50 µ in.) Nickel.

6 is 0,76 µm (30 µ in.) GXT™ Palladium-Nickel Alloy w/Gold Flash over 1,27 µm (50 µ in.) Nickel.

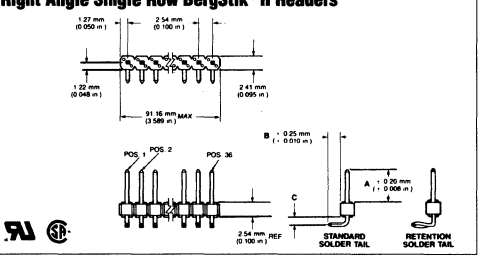
Straight Single Row BergStik® II Headers



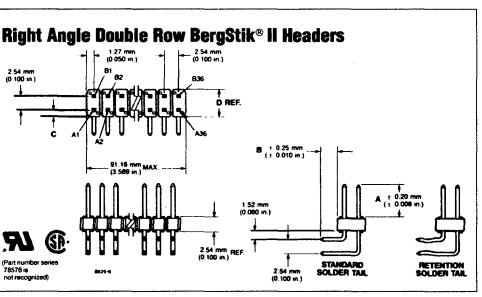
Straight Double Row BergStik® II Headers



Right Angle Single Row BergStik® II Headers



Right Angle Double Row BergStik® II Headers



Ordering Data—Straight Single Row:

H Length Above Plastic mm	H Length Above Plastic in.	G Length Below Plastic mm	G Length Below Plastic in.	F Overall Length mm	F Overall Length in.	Part Numbers Standard Product	Number of Positions	Plating
5,84	0.230	3,05	0.120	11,43	0.450	68001-xxx	1–36	1, 2, 3, 4, 5 or 6
5,84	0.230	3,05	0.120	11,43	0.450	69190-xxx*	1–36	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	13,67	0.538	78511-xxx	1–36	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	13,67	0.538	78229-xxx*	1–36	1, 2, 3, 4, 5 or 6

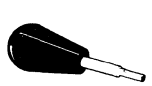
Ordering Data—Straight Double Row:

H Length Above Plastic mm	H Length Above Plastic in.	G Length Below Plastic mm	G Length Below Plastic in.	F Overall Length mm	F Overall Length in.	Part Numbers Standard Product	Number of Positions	Plating
5,84	0.230	3,05	0.120	11,43	0.450	67997-xxx	2–72	1, 2, 3, 4, 5 or 6
5,84	0.230	3,05	0.120	11,43	0.450	69192-xxx*	2–72	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	13,67	0.538	68691-xxx	2–72	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	13,67	0.538	78548-xxx*	2–72	1, 2, 3, 4, 5 or 6

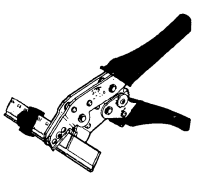
Ordering Data—Right Angle Single Row:

H Length Above Plastic mm	H Length Above Plastic in.	G Length Below Plastic mm	G Length Below Plastic in.	F Bend Distance From Plastic mm	F Bend Distance From Plastic in.	Part Numbers Standard Product	Number of Positions	Plating
5,84	0.230	3,05	0.120	1,52	0.060	68016-xxx	1–36	1, 2, 3, 4, 5 or 6
5,84	0.230	3,05	0.120	1,52	0.060	69191-xxx*	1–36	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	1,52	0.060	68423-xxx	1–36	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	1,52	0.060	78554-xxx*	1–36	1, 2, 3, 4, 5 or 6

HT-143 BergStik® Header Polarizing Tool



HT-320 BergStik® Header Cutting Tool



Ordering Data—Right Angle Double Row:

A Length Above Plastic mm	A Length Above Plastic in.	B Length Below Plastic mm	B Length Below Plastic in.	C mm	C in.	D mm	D in.	Part Numbers Standard Product	Number of Positions	Plating
5,84	0.230	3,05	0.120	1,78	0.070	6,10	0.240	79257-xxx	2–72	1, 2, 3, 4, 5 or 6
5,84	0.230	3,05	0.120	1,78	0.070	6,10	0.240	78299-xxx*	2–72	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	1,78	0.070	6,10	0.240	79258-xxx	2–72	1, 2, 3, 4, 5 or 6
8,08	0.318	3,05	0.120	1,78	0.070	6,10	0.240	78276-xxx*	2–72	1, 2, 3, 4, 5 or 6

Ordering data—Low Profile:

A Length Above Plastic mm	A Length Above Plastic in.	B Length Below Plastic mm	B Length Below Plastic in.	C mm	C in.	D mm	D in.	Part Numbers Standard Product	Number of Positions	Plating
5,84	0.230	3,05	0.120	1,14	0.045	4,83	0.190	68021-xxx	2–72	1, 2, 3, 4, 5 or 6
5,84	0.230	3,05	0.120	1,14	0.045	4,83	0.190	69193-xxx*	2–72	1, 2, 3, 4, 5 or 6
8,08	0.318	3,18	0.125	1,14	0.045	4,83	0.190	68696-xxx	2–72	1, 2, 3, 4, 5 or 6

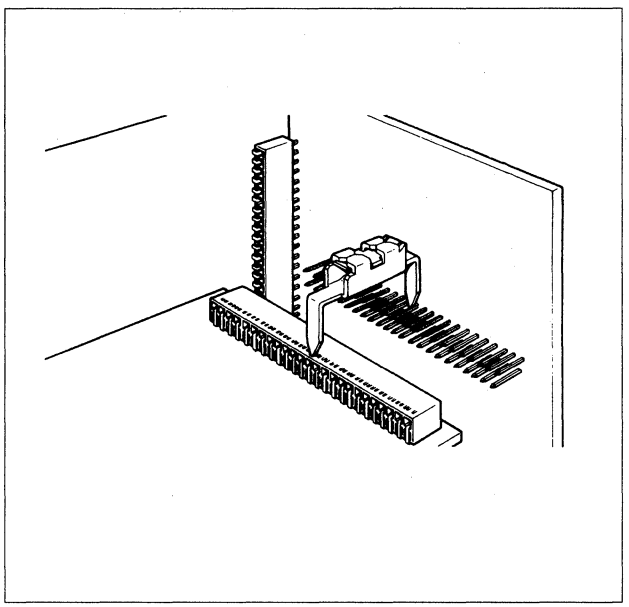
**Retentive solder tail part number*

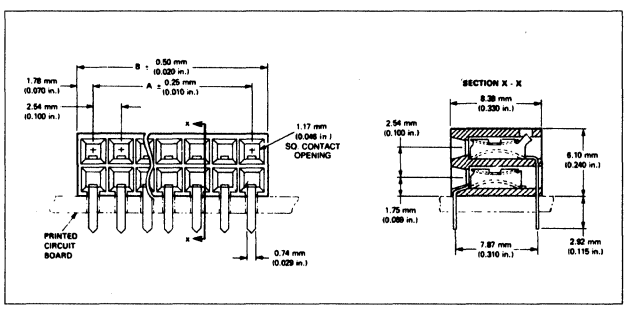
DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

Horizontal Card Connectors

66925 and 66928 Series Horizontal PV™ Card Connectors

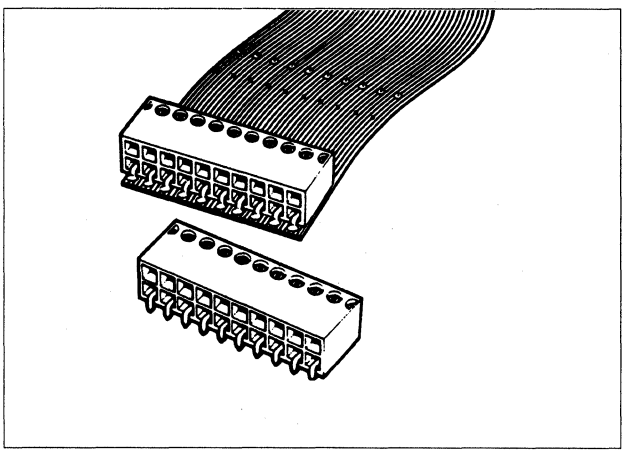




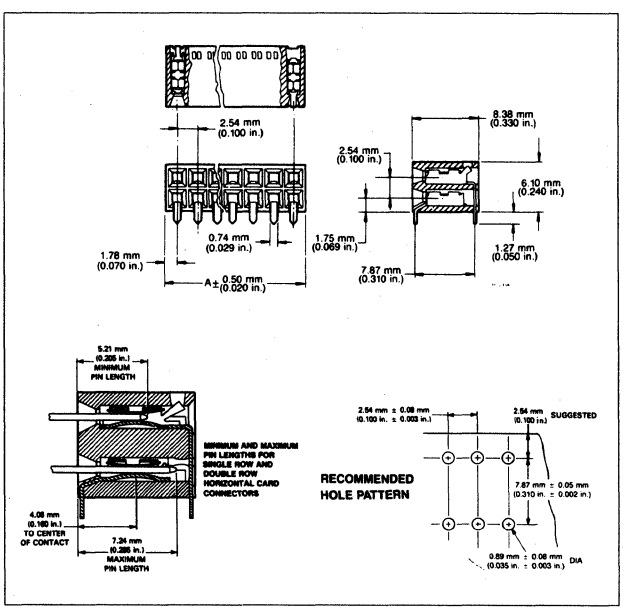
Housing rated UL94V-0. Insulation resistance: 5 x 10^4 MΩ minimum. Temperature range: –65°C to +170°C. Double row. UL recognized, CSA certified.

Type	Terminations per Row	Dimensions (In.) A	Dimensions (In.) B
66925-005	5	0.400	0.540
66925-008	8	0.700	0.840
66925-010	10	0.900	1.040
66925-012	12	1.100	1.240
66925-020	20	1.900	2.040
66925-025	25	2.400	2.540
66928-005	5	0.400	0.540
66928-008	8	0.700	0.840
66928-010	10	0.900	1.040
66928-012	12	1.100	1.240
66928-020	20	1.900	2.040
66928-025	25	2.400	2.540

67943 Series Horizontal PV™ Card Connectors



- Dual-Metal PV contact
- Flexible Circuitry
- Right Angle and In-Line Mounting
- Mate with 0.025" Square and Round Pins



Housing meets requirements of MIL-P-46184, UL94V-0. Color black. Insulation resistance of 5 x 10^4 MΩ minimum. Temperature range of –65°C to +105°C. Withstanding voltage, 1250V rms. Contacts have brass body, beryllium copper spring, and finish of 30 μ inches gold with gold flash over nickel. Current rating, 3AΩ maximum. Resistance of 100 MΩ maximum per contact initially, 15 MΩ maximum per contact after tests. Capacitance, 2pF maximum. UL recognized, CSA certified.

Type	No. of Positions	Dimension A (Inches)
67943-005	2 x 5	0.540
67943-008	2 x 8	0.840
67943-010	2 x 10	1.040
67943-012	2 x 12	1.240
67943-020	2 x 20	2.040
67943-025	2 x 25	2.540

DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

Vertical Card Connectors

66956, 68046, 68429, 68684, 66956, 76314 and 76316 series PV™ card connectors are housed in glass-filled polyester rated UL94V-0. Temperature range: –65°C to +125°C. 66956, 68429, 76314 and 76316 series feature reliable dual metal PV contact for modular and programming applications. Mate with 0.025 inch square and round pins. Contact has brass body and beryllium copper spring 0.0035 inch thick, 30 μ in. gold with gold flash over nickel finish. Current rating of 3A maximum. Withstanding voltage, 1250V rms. Insulation resistance, 1 x 10^5 MΩ minimum. Housing for 68429 series also meets requirements of MIL-M-24519. Come in black. Per contact resistance is 15 MΩ maximum. Capacitance: 2pF maximum. Per contact resistance for 66956, 76314 and 76316 series is 12 MΩ maximum. Capacitance: 1,5pF maximum. 68046, 68682 and 68684 series feature low profile to allow dense packaging. Contact has preloaded dual beam design and low insertion force. Duplex plating for minimum gold consumption. Duplex-contact area has finish of 30 μ in. minimum gold over nickel and solder leg has 100 μ in. minimum tin/lead. Current rating: 3 amps DC for individual contacts at ambient temperature ≤20°C and 2 amps DC for total connector. Resistance is 15 mΩ maximum initially and 20 mΩ maximum after tests. Insulation resistance: 10^5 MΩ minimum. Withstanding voltage: 1000V rms. Capacitance: 1,5pF maximum. UL recognized, CSA certified.

Dual Entry Card Connectors

- Dual Entry
- Stackable End-To-End and Side-To-Side

68684 series are stackable end-to-end and side-to-side.

Single Row, 0.100" Center Card Connectors

Type	Number of Positions	Width
68684-305	5	0.517
68684-308	8	0.817
68684-310	10	1.017
68684-312	12	1.217
68684-320	20	2.017
68684-325	25	2.517

Surface Mounted Card Connectors

Floating contacts allow solder legs to self-center on pads. 68046 series feature contacts that allow solder legs to self-center on pads.

Double Row, 0.100" Centers

Type	Number of Positions	Width
68046-605	2 x 5	0.517
68046-608	2 x 8	0.817
68046-610	2 x 10	1.017
68046-612	2 x 12	1.217

68429 Series Flexible Circuitry PV™ Card Connectors

Double Row, 0.100" Centers

Type	Number of Positions	Width
68429-005	2 x 5	0.500
68429-008	2 x 8	0.800
68429-010	2 x 10	1.000
68429-012	2 x 12	1.200
68429-020	2 x 20	2.000
68429-025	2 x 25	2.500

66956, 76314 and 76316 Series PV™ Card Connectors

66956 Double Row, 0.100" x 0.154" Grid

PLATED 30 μ in Gold

Type	Terminations per Row	Dim. A Width
66956-005	5	0.500
66956-008	8	0.800
66956-010	10	1.000
66956-012	12	1.200
66956-020	20	2.000
66956-025	25	2.500

76314 Double Row, 0.100" x 0.100" Grid

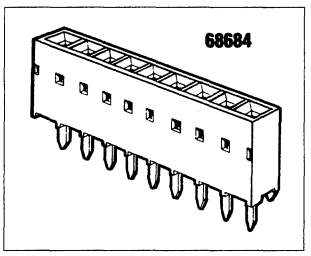
PLATED 30 μ in Gold

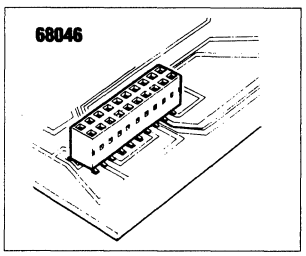
Type	Terminations per Row	Dim. A Width
76314-105	5	0.500
76314-108	8	0.800
76314-110	10	1.000
76314-112	12	1.200
76314-120	20	2.000
76314-125	25	2.500

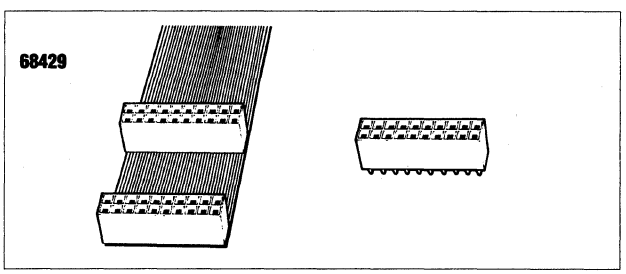
76316 Double Row, 0.100" x 0.100" Grid

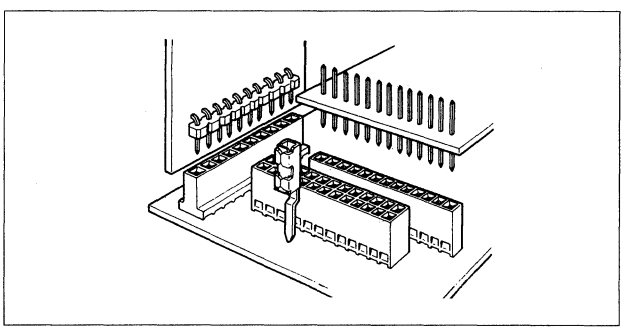
PLATED tin-lead

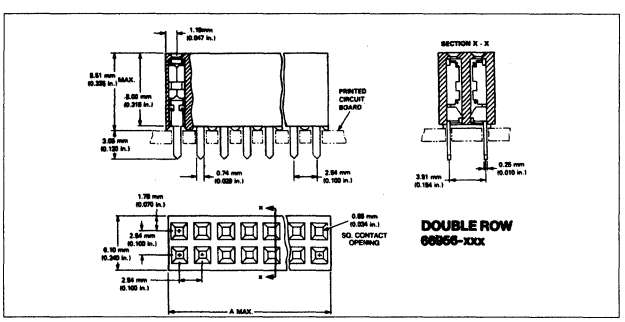
Type	Terminations per Row	Dim. A Width
76316-905	5	0.500
76316-908	8	0.800
76316-910	10	1.000
76136-912	12	1.200
76136-920	20	2.000
76136-925	25	2.500

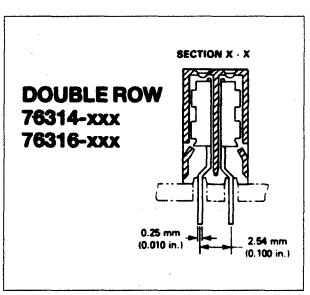


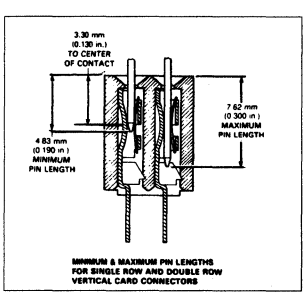










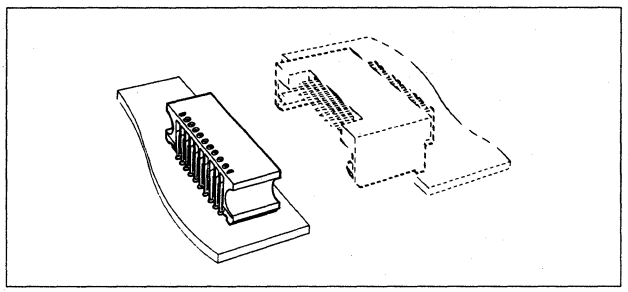


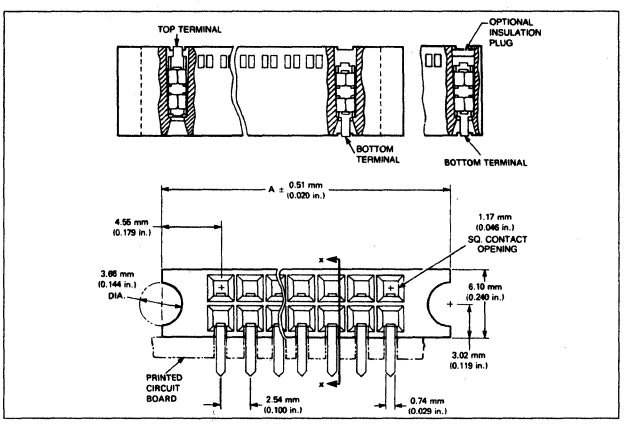
DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

Radius End Connectors

66527 Series Horizontal PV™ Card Connectors with Radius End



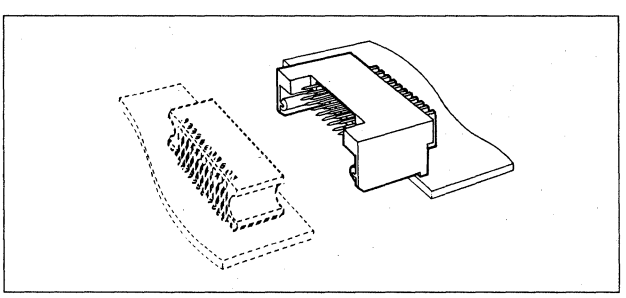


Radius ends and header guide posts assure connectors are aligned before contact engagement. Mate with vertical and right angle guide pin headers. Double row. UL recognized, CSA certified.

Type	Number of Positions	Dimension A
66527-005	2 x 5	0.758"
66527-008	2 x 8	1.058"
66527-010	2 x 10	1.258"
66527-012	2 x 12	1.458"
66527-020	2 x 20	2.258"
66527-025	2 x 25	2.758"

Guide Pin Headers

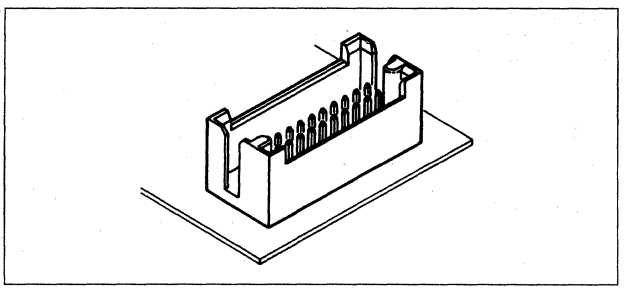
69925 Series Right Angle Guide Pin Headers



Made of black glass-filled thermoplastic rated UL94V-0. *Insulation resistance*: 1 x 10^5 MΩ minimum. *Temperature range*: –65°C to +105°C. *Withstanding voltage*: 1000V rms. Phosphor bronze pin with 30 µ inch gold over nickel finish. *Current rating*: 3A maximum.

Type	Size
69925-005	2 x 5
69925-008	2 x 8
69925-010	2 x 10
69925-012	2 x 12
69925-020	2 x 20
69925-025	2 x 25

67273 Series Vertical Guide Pin Headers



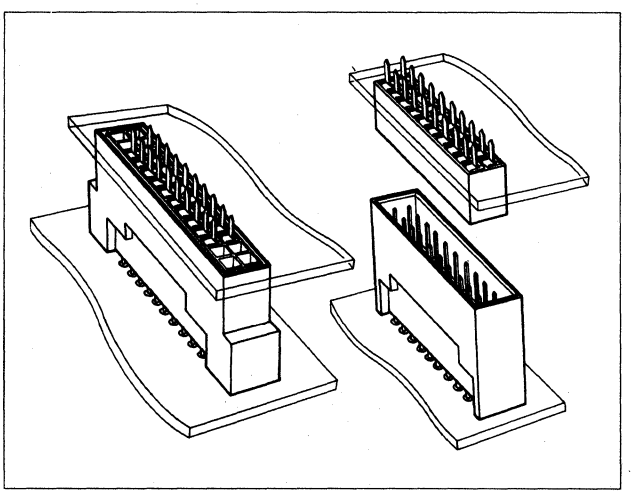
Headers have double rows and 0.100 inch centers. Guide posts assure header and card connector align before contact engagement. Card slot provides polarization. Four-wall shroud prevents pin damage. Standoffs allow cleaning to remove soldering contaminants. Header body made of glass-filled polyester rated UL94V-0. *Insulation resistance*: 1 x 10^5 MΩ minimum. *Temperature range*: –65°C to +105°C. *Withstanding voltage*: 2400V rms. Phosphor bronze pin with 30 µ inch gold over nickel finish. *Current rating*: 3A maximum. UL recognized, CSA certified.

Double Row

Type	Number of Positions
67273-005	2 x 5
67273-008	2 x 8
67273-010	2 x 10
67273-012	2 x 12
67273-020	2 x 20
67273-025	2 x 25

Vertical Stacking Headers

68582 and 68583 Series Vertical Stacking Headers with Mounting Ears



Vertical stacking headers provide 0.755 in. Board-Board spacing and come with or without mounting ears. Made of glass-filled nylon UL94V-0, color black. *Insulation resistance*: 1 x 105 MΩ minimum. *Temperature range*: –40°C to +105°C. *Withstanding voltage*: 1000V rms. Phosphor bronze pin. Finish is 30 µ inch GXT over 50 µ inch nickel. *Current rating*: 3A maximum. UL recognized, CSA certified.

68582 Series Stacking Headers with Mounting Ears

Type	Size
68582-003	2 x 5
68582-008	2 x 10
68582-013	2 x 15
68582-001	2 x 20
68582-022	2 x 25

68583 Series Stacking Headers without Mounting Ears

68583-001	2 x 5
68583-006	2 x 10
68583-011	2 x 15
68583-016	2 x 20
68583-021	2 x 25

DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

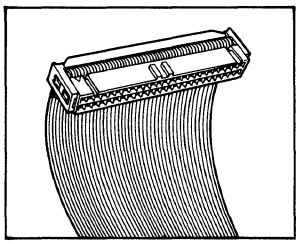
QUICKIE™ III IDC SYSTEM

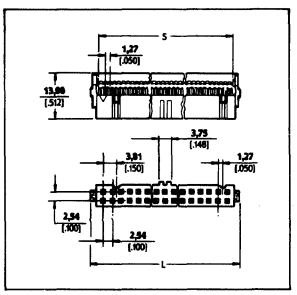
The Quickie III system includes a complete line of female connectors, straight and right angle headers, and edge card connectors. Products are available in a variety of sizes ranging from 6 to 64 positions.

The female connector has a single-beam, long-wipe contact that provides a highly reliable electrical connection. A pre-installed bridge-type cover protects the contacts during handling and provides precise cover-to-base alignment during installation. It also reduces the assembly time required during connector installation.

Quickie III headers feature a unique duplex-plated pin with two-sided plating in the contact area; whereas, the two contact sides of the pin are plated in either gold or GXT, and the two noncontact sides of the pin are plated with gold flash. The solder-tail portion of the pin is fully plated with tin/lead.

These headers also feature four-wall shielding that protects the pin when the header is unmated, and dual-function latches that both lock and eject a mated connector.





QUICKIE III FEMALE CONNECTOR

71600 Series 0.76μ (30 μ in.) Gold over nickel (postplated)

Part Numbers 71600 Series			DIMENSIONS			
	Dash Numbers—Central/Dual Polarization		L		S	
Number of Positions	Female Assembly	Female Assembly with Strain Relief (Standard)	MM.	IN.	MM.	IN.
10	-110	-010	17,16	0.6756	13,33	0.525
14	-114	-014	22,24	0.8756	18,41	0.725
16	-116	-016	24,78	0.9756	20,95	0.825
18	-118	-018	27,32	1.0756	23,49	0.925
20	-120	-020	29,86	1.1756	26,03	1.025
26	-126	-026	37,48	1.4756	33,65	1.325
34	-134	-034	47,64	1.8756	43,81	1.725
40	-140	-040	55,26	2.1756	51,43	2.025
44	-144	-044	60,34	2.3756	56,51	2.225
50	-150	-050	67,96	2.6756	64,13	2.525
60	-160	-060	80,66	3.1756	76,83	3.025
64	-164	-064	85,74	3.3756	81,91	3.225

Technical data:

Grid: 2,54 x 2,54 mm [.100 x .100 inch]

Polarization: By means of a polarization plug

Body:

Material: Glass-filled thermoplastic polyester (UL94V-0). Color grey.

Insulation resistance: 1 x 10^5 MΩ min.

Temperature range: -65° to +125°C

Withstanding voltage: 1000V rms (sea level)

Contact:

Material: Phosphor bronze.

Finish: 71600 -0.76 μm (*30 μ in.) Gold over nickel (Postplated)

Current rating: 1 A

Resistance: 15 mΩ max.

Packaging:

Standard bulk: Multiples of 500

Optional tube: Multiples of 500—To order add T to end of dash number; Example 71600-110T

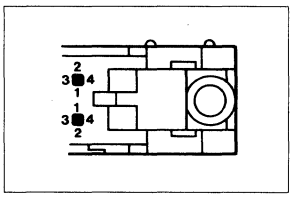
QUICKIE III HEADERS

71912 and 71918 Series, 4-wall Straight

71912: 0.76 μm (30 μ in.) Gold over nickel

71918: 0.76 μm (30 μ in.) GXT™ (Palladium-nickel alloy with gold flash) over nickel.

Note: These platings are on sides 1 and 2. Sides 3 and 4 are gold flash. See right.

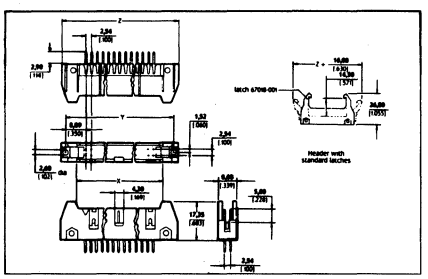


Number of positions	Part numbers 71912-xxx 71918-xxx Dash numbers: standard latches	low profile latches	without latches	DIMENSIONS X MM.	X IN.	Y MM.	Y IN.	Z MM.	Z IN.
2x3	-106	-206	-006	13,15	0.518	22,86	0.900	26,92	1.060
2x4	-108	-208	-008	15,69	0.618	25,40	1.000	29,46	1.160
2x5	-110	-210	-010	18,23	0.718	27,94	1.100	32,00	1.260
2x7	-114	-214	-014	23,31	0.918	33,02	1.300	37,08	1.460
2x8	-116	-216	-016	28,85	1.018	35,56	1.400	39,62	1.560
2x9	-118	-218	-018	38,39	1.118	38,10	1.500	42,16	1.660
2x10	-120	-220	-020	30,93	1.218	40,64	1.600	44,70	1.760
2x13	-126	-226	-026	38,55	1.518	48,26	1.900	48,26	2.060
2x17	-134	-234	-034	48,71	1.918	58,42	2.300	58,42	2.460
2x20	-140	-240	-040	56,33	2.218	66,04	2.600	66,04	2.760
2x22	-144	-244	-044	61,41	2.418	71,12	2.800	71,12	2.960
2x25	-150	-250	-050	69,03	2.718	78,74	3.100	78,74	3.260
2x30	-160	-260	-060	81,73	3.218	91,44	3.600	91,44	3.760
2x32	-164	-264	-064	86,81	3.118	96,52	3.800	96,52	3.960

Notes:
1. Pin: 0,64 mm [.025 inch] square
2. Standard polarization key 67020-001
3. Double-bump polarization key 67020-002

PC Board specification

Thickness 1,58 [.062]



Polarization

By cutting off a pin and adding a polarization plug to the mating female connector. By using QUICKIE Female and molded single polarizing ridge or dual polarizing grooves in conjunction with header utilizing dual polarization keys.

Body:

Material: Glass-filled thermoplastic polyester (UL94V-0). Color grey.

Insulation resistance: 1 x 10^5 MΩ min.

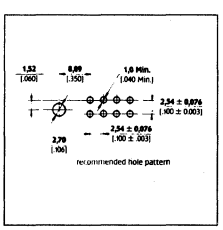
Temperature range: -65°C to +125°C

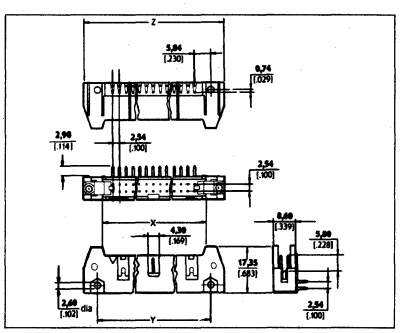
Withstanding voltage: 1000V rms (sea level)

Pin:

Material: Phosphor bronze.

Current rating: 1A





Note: Sizes shown are representative; for more complete information call your Du Pont Electronics distributor. (See listing last page of this section.)

Du Pont Electronics

Interconnect and Packaging Products

Clincher™ Connector Mass Termination System

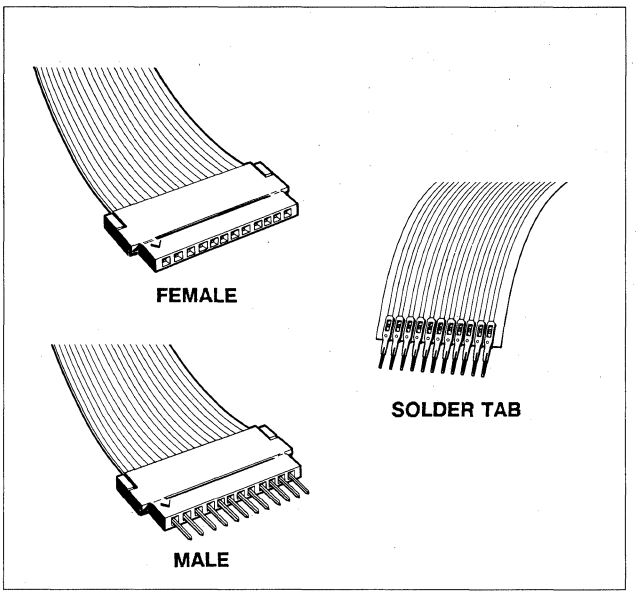
The Du Pont Clincher™ system mass terminates flat conductor, flat cable or flex circuitry used in packaging applications requiring maximum flexibility and optimum space and weight savings.

The female Clincher™ simultaneously terminates all cable conductors without stripping and is ready for production use within 15 seconds, substantially reducing total installed cost over individually terminated methods. The Clincher™ assembly mates to 0,64 mm (0.025 in.) pins or headers on 2,54 mm (0.100 in.) centers to form a complete interconnection system.

The male Clincher™ offers the same features as its female counterpart. It can also be used to make a flying connection to a female Clincher™, PV™/housing assembly, or any other receptacle which can mate to 0,64 mm (0.025 in.) square pins.

The Clincher™ Solder Tab is designed to mass terminate flat, flexible cable and circuitry for soldering to a printed circuit board.

Easy-to-operate application equipment completes the Clincher™ system.



Performance Data

Insulation Resistance: 5 x 10^4 megohms. min. *Dielectric Withstanding Voltage*: 500 VAC, rms. *Current Rating*: 2A. *Insertion Force*: 500 grams max. (400 grams avg.) when mated to 0.025" square tin/lead plated pins. *Withdrawal Force*: 30 grams min. (50 grams avg.) when mated to 0.025" square tin/lead plated pins.

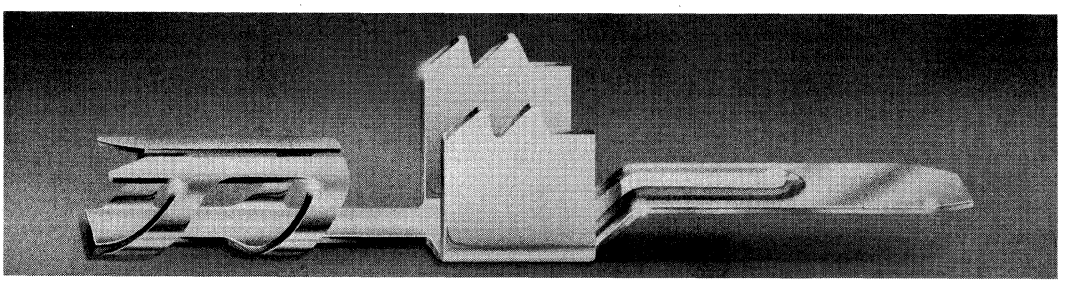
Clincher Connector

Housing Material: Blue polypropylene, flame retardant per UL94V-0. *Contact Material*: 1/2 hard copper-nickel alloy. *Contact Plating*: 30 µ in. gold in contact area or 100 µ in. tin/lead overall. *Spring Material*: 1/2 hard, heat-treated beryllium-copper alloy. *Spring Plating*: 20 µ in. gold or 10 µ in. tin/lead.

Clincher Solder Tab

Material: 1/2 hard copper-nickel alloy. *Plating*: 100 µ in. tin/lead.

Rib-Cage™ II 0.050 Inch Connector for High Density Packaging



The new Rib-Cage™ II connector on 0.050 inch centers is designed for high density, low profile printed circuit board packaging. It is available in both surface-mount and through-mount configurations. The low profile of the connector allows for tight parallel board packaging.

Rib-Cage II is available in a double-row vertical card connector configuration in two by five through two by fifty positions, in increments of two by five. The contacts are duplex-plated with 30 microinches of gold in the contact area, providing gold only where needed for a more reliable and economical connector.

Rib-Cage II connectors are designed for low profile systems requiring high density. The connectors require only one-eighth the space of 0.100 inch connectors with the same number of contacts.

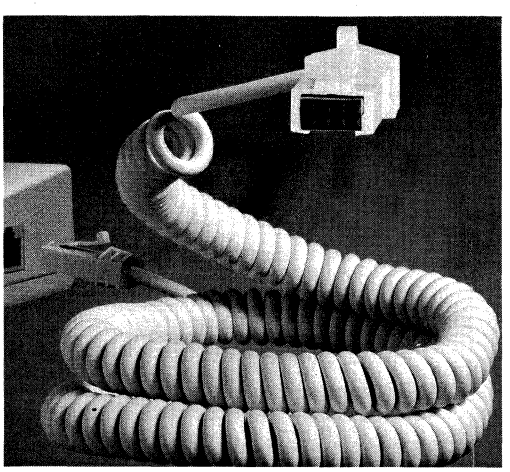
Latch-N-Lok™ Shielded Assemblies.

Improve your system's sales appeal. Choose from the industry's widest variety of compact plugs and receptacles. Straight, right-angle or combination designs. Latch on top, bottom or side. Panels, chassis or board mounted receptacles. And cords—coiled or straight—in any length, with any number of conductors, and foil, serve or braid shielding. Latch-N-Lok can use a variety of wire gauges (22 to 30 AWG) within an assembly.

All of these combinations can be customized and color-coordinated to your system. Costs no more than standard assemblies.

Latch-N-Lok is the only quick disconnect pin-and-socket system with a contact design proven over millions of applications.

Call **1-800-237-4357** for additional information.



DuPont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

The EMPIRE SYSTEM™ . . .

.025" square board-to-board interconnects on .100" centers

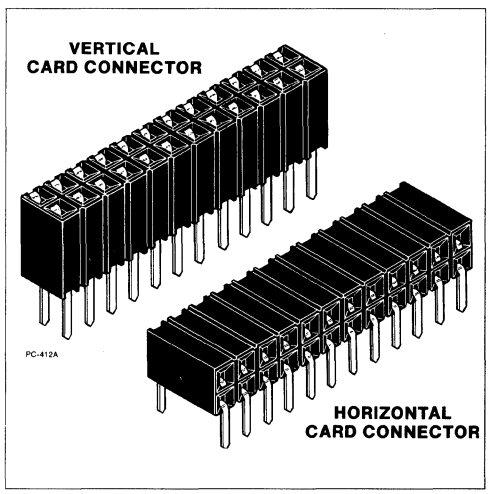
The EMPIRE SYSTEM is a family of card connectors, 'stik' headers and shunts that offer a reliable and economical alternative to other modular interconnect systems for high-volume applications. The two-piece interconnection system is on 0.100 inch grid spacing and offers a broad range of components for mother/daughter and parallel printed circuit board packaging for a wide range of electronic products.

Double-row card connectors are available in horizontal- and vertical-entry styles in 4 to 100 positions and feature duplex-plated contacts. Straight and right angle headers feature retention legs that eliminate the need for a clinching operation prior to wave soldering. The shunts are available in two heights. A variety of contact platings are offered to meet specific performance and cost requirements. The EMPIRE SYSTEM is available worldwide from Du Pont and its distributor network with "just-in-time" delivery.

Request Bulletin 710 for a complete product listing.

HORIZONTAL CARD CONNECTORS

Type	Number of Positions	Plating
79412-303	2 x 3	30 µ in. Gold
79412-304	2 x 4	30 µ in. Gold
79412-305	2 x 5	30 µ in. Gold
79412-306	2 x 6	30 µ in. Gold
79412-308	2 x 8	30 µ in. Gold
79412-310	2 x 10	30 µ in. Gold
79412-312	2 x 12	30 µ in. Gold
79412-315	2 x 15	30 µ in. Gold
79412-317	2 x 17	30 µ in. Gold
79412-320	2 x 20	30 µ in. Gold
79412-325	2 x 25	30 µ in. Gold
79412-403	2 x 3	Tin/Lead
79412-404	2 x 4	Tin/Lead
79412-405	2 x 5	Tin/Lead
79412-406	2 x 6	Tin/Lead
79412-408	2 x 8	Tin/Lead
79412-410	2 x 10	Tin/Lead
79412-412	2 x 12	Tin/Lead
79412-415	2 x 15	Tin/Lead
79412-417	2 x 17	Tin/Lead
79412-420	2 x 20	Tin/Lead
79412-425	2 x 25	Tin/Lead



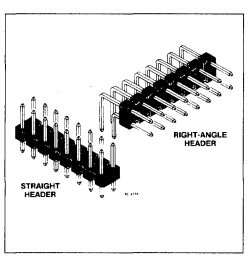
VERTICAL CARD CONNECTORS

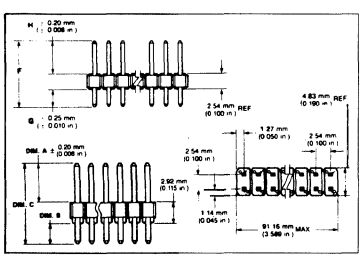
Type	Number of Positions	Plating
79410-303	2 x 3	30 µ in. Gold
79410-304	2 x 4	30 µ in. Gold
79410-305	2 x 5	30 µ in. Gold
79410-306	2 x 6	30 µ in. Gold
79410-308	2 x 8	30 µ in. Gold
79410-310	2 x 10	30 µ in. Gold
79410-312	2 x 12	30 µ in. Gold
79410-315	2 x 15	30 µ in. Gold
79410-317	2 x 17	30 µ in. Gold
79410-320	2 x 20	30 µ in. Gold
79410-325	2 x 25	30 µ in. Gold
79410-403	2 x 3	Tin/Lead
79410-404	2 x 4	Tin/Lead
79410-405	2 x 5	Tin/Lead
79410-406	2 x 6	Tin/Lead
79410-408	2 x 8	Tin/Lead
79410-410	2 x 10	Tin/Lead
79410-412	2 x 12	Tin/Lead
79410-415	2 x 15	Tin/Lead
79410-417	2 x 17	Tin/Lead
79410-420	2 x 20	Tin/Lead
79410-425	2 x 25	Tin/Lead

EMPIRE SYSTEM™

STIK HEADERS

Empire stik headers have retentive tails that provide 0.5 lb. minimum retention prior to soldering on 0.062 inch thick PC boards. Drawn 0.025 inch square wire presents 4 smooth mating surfaces. Pins positioned on 0.100" centers. Standoffs allow cleaning to eliminate soldering contaminates. Header body made of glass-filled nylon rated UL94V-0, color black. Insulation resistance, 500 MΩ minimum. Temperature range, –65°C to +105°C. Withstanding voltage, 1500V rms at sea level. Phosphor bronze pin, current rating, 5A minimum. Retention force to body, 2 lb. in either direction.





Ordering Data

To order, use the following information to determine the part number for your specific header requirements.

All parts have an eight-digit part number: the first five digits form the **base number** and represent the type of header (straight or right angle); the last three digits form the **dash number** and indicate the plating and position requirements of the header.

Example: 86380-124 is a straight header plated with 0.76 µm (30 µ in.) gold over 1.27 µm (50 µ in.) nickel and has 24 (2 x 12) total positions.

00000-XXX

Base Number
86380 Straight Headers
86381 Right Angle Headers

Number of Positions (Even)
04 (2 x 2) min.
72 (2 x 36) max.

Plating No.
1 — 0.76 µm (30 µ in.) gold over 1.27 µm (50 µ in.) nickel
4 — 3.81 µm (150 µ in.) 93/7 tin/lead

EMPIRE SYSTEM SHUNTS

(Two Designs)

Both mate with 0.025 inch square pins on 0.100 inch centerline. Dual-beam phosphor bronze contact. Finish: Gold over nickel or tin/lead. Housed in glass-filled thermoplastic polyester; color–black.

Insulation resistance: 50,000 MΩ minimum.

Withstanding voltage: 750V rms.

Temperature range: –55°C to +120°C

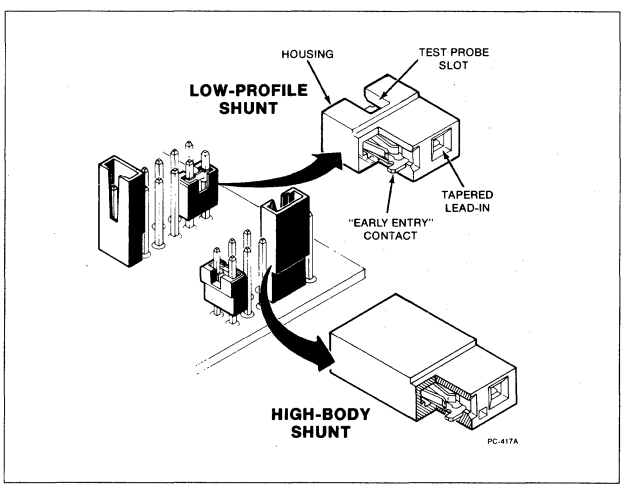
Contact current rating: 2.5 A max.

Resistance: 15mΩ max.

Minimum length of mating pin: 0.155 in.

Series 68786 Low Profile Shunt is ideally suited for high density applications. (0.200 inch high)

Series 71363 High Body Shunt is easy-to-handle during installation. (0.340 inch high)



DuPont Electronics

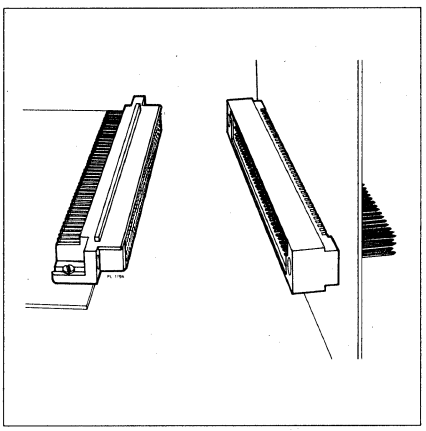
INTERCONNECT AND PACKAGING PRODUCTS

HPC Interconnect System

A high density, low insertion force backpanel-to-daughter board 3 and 4 row I/O system

Features

- High normal force of 75 grams per beam approximately twice that of connectors at a comparable insertion force.
- Early entry, long wipe—with contacts at the outer edge of the female receptacle. Each inserted pin wipes its full length, assuring contact even if PC boards are bowed.
- Plastic lead-in guards against damage to the female receptacle during mating—especially useful if "blind" matings are needed.
- HPC systems can be ordered with staggered mating pin lengths. Specified pins can make contact first, break contact last. Ground or power pins can connect before other pins to protect against chip burn-out.



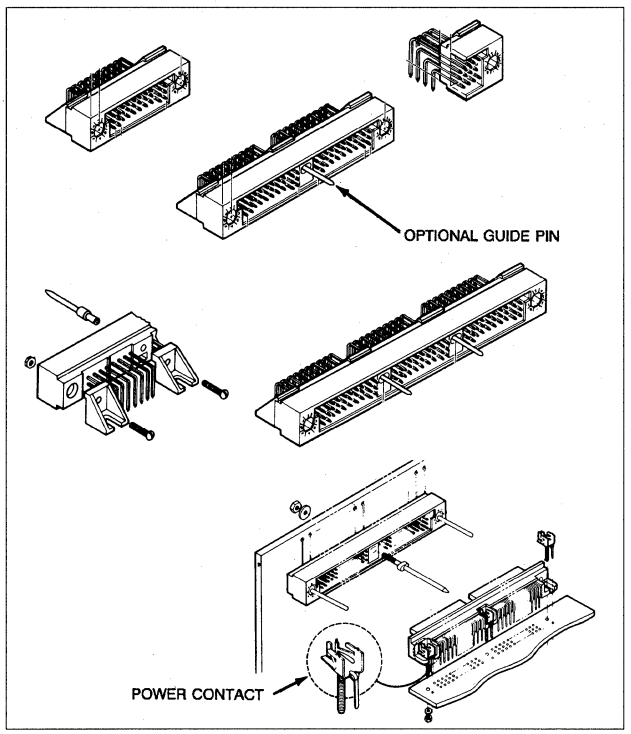
Housings:

Material—Female	Thermoplastic (UL94V-0), black, up-to 150 positions per row
Material—Male	Glass-filled thermoplastic (UL94V-0), color black, up-to 150 positions per row

Contact:

Material—Female	Beryllium-copper alloy
Material—Male	Phosphor-bronze, 3/4 hard per ASTM B-159
Plating	30 µ in. gold, 30 µ in. GXT
Leg Length	Various
Grid	2,54 x 2,54 mm (0.100 x 0.100 in.)

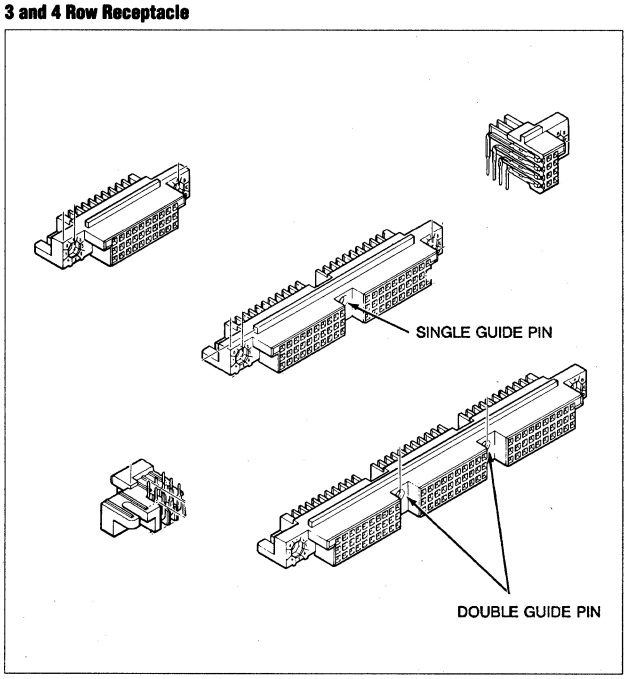
3 and 4 Row Right Angle Header



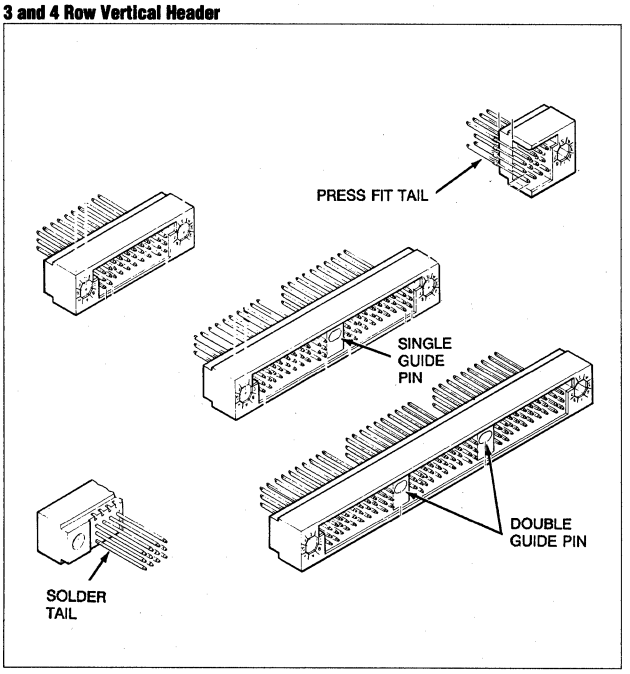
Power and Static Discharge

Hardware is available for HPC product that can be used for static discharge or conducting power. The gold-plated power guide pins and contacts conduct power up to 20 amps from backplane to card at guide pin and end boss locations. Static discharge hardware is physically identical to power hardware except for being nickel plated.

3 and 4 Row Receptacle



3 and 4 Row Vertical Header



DuPont Electronics

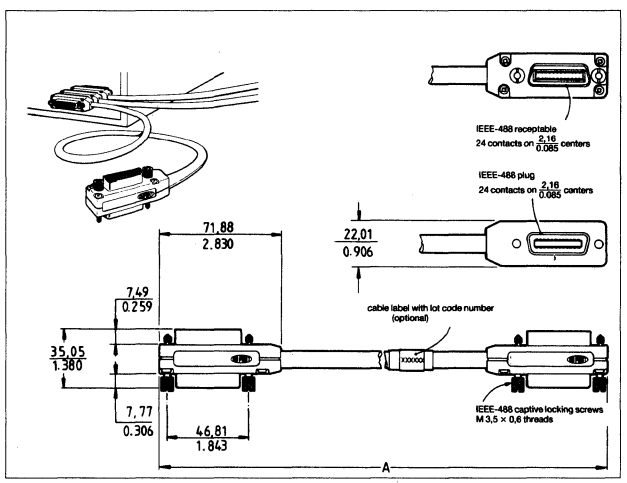
INTERCONNECT AND PACKAGING PRODUCTS

GPIB SHIELDED CABLE ASSEMBLIES

General Purpose Interface Bus (GPIB) assemblies feature double shielded cable, metal cast connector housing and shield termination. Pre-loaded cantilever beam ensures low connector insertion force and minimum contact wear. Interface meets IEEE-488 specifications. Spacing, 0.85 inch. Connector has insulation resistance of 10GΩ minimum, 1A maximum current rating, and 1,000 cycles durability. Contact force of 1-1, 5N per contact, with 24 contacts per connector side. Housed in black glass-filled thermoplastic polyester rated UL94V-0. Contact is of beryllium copper with 30 μ inch gold over nickel finish. Shielded cover is of zinc alloy with nickel finish. Black oxidized steel captive locking screw and metric thread. Double shielded cable made of aluminum/mylar polyester film tape with braid and drain wire. Gray PVC insulation. Material conductors, AWG 26-7/34. Signal line resistance is 0.14 μ/m maximum, bulk resistance braid is 0,0085Ω/m maximum. Capacitance, 150pF/m maximum at 1kHz. Impedance of 70–75Ω. Operating temperature, 80°C maximum.

Standard GPIB assembly lengths

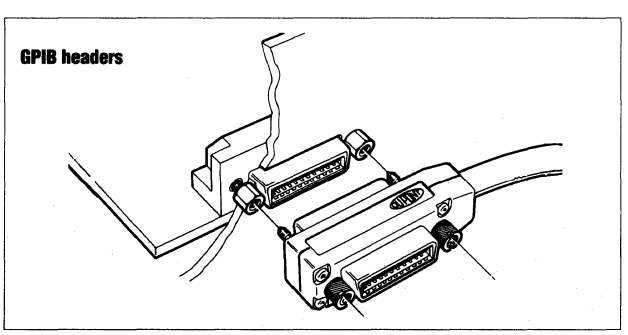
Type	Dimension A (Inches)
81190-005	23.62
81190-010	43.30
81190-020	82.68
81190-040	161.42
81190-060	240.16
81190-080	318.90



GPIB HEADERS

General Purpose Interface Bus (GPIB) Headers have 0.85 inch spacing. Connector has insulation resistance of 10GΩ mimimum, contact resistance of 10mΩ maximum, withstanding voltage of 1000 VAC rms, and current rating of 1.5A maximum. Contact force is 1-1, 5N per contact and durability is 1000 cycles. 24 contacts. Housed in glass-filled thermoplastic polyester UL listed 94V-0, color black. Contact material is beryllium copper, and finish is 30 μ inch gold over nickel in contact area and 100 μ inch tin/lead over nickel on the soldertail. Shield and R/A bracket are low carbon steel with nickel finish. Threaded clinching nuts are low carbon steel with cadmium and clear chromate. Temperature range: –55°C to +105°C.

Type	Description
68277-001	4–40 UNC 2B threaded holes



Custom Terminators

Du Pont I/O terminators are designed to provide a known impedance at the end of a bus line improving signal and data integrity by controlling reflections back through the system.

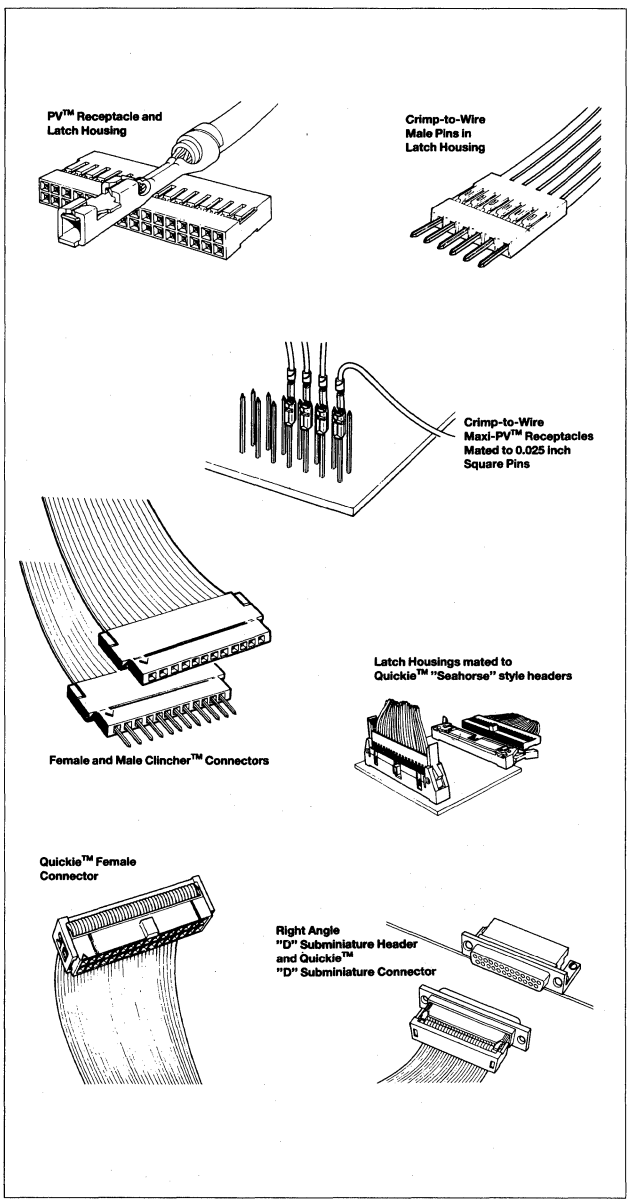
These pluggable terminators were developed on 0.100 inch, 0.085 inch and 0.109 inch centers to meet industry needs for SCSI (Small Computer Systems Interface), SMD (Storage Module Device) and IPI (Intelligent Peripheral Interface) system communications standards. Custom resistor networks can also be developed and adapted to customer interconnect requirements.

Pluggable terminators by Du Pont will simplify changes in peripheral equipment and save valuable printed circuit board real estate previously occupied by discrete resistors.

For more details, ask for Bulletin 2307 or see General Catalog 88-B.

IDC Assemblies . . . Standard Crimp-to-Wire Assemblies . . . Subsystems

The Du Pont Electronics Authorized Distributors (listed on the back page of this section) are recommended sources for QUICKIE™ IDC Assemblies. Du Pont also offers automated manufacturing services for high-volume crimp-to-wire assemblies, IDCs, and more technically demanding assemblies and subsystems. For additional information, call 1-800-233-1173.



Note: Sizes shown in this catalog section are representative; for more complete information call your Du Pont Electronics distributor. (See listing last page of this section.)

Du Pont Electronics

INTERCONNECT AND PACKAGING PRODUCTS

Authorized Distributors

ALABAMA
HUNTSVILLE
Arrow/Kierulff Electronics
205-837-6955
Hammond Electronics
205-830-4764

ARIZONA
PHOENIX
Aero-Space Southwest
602-582-2779

Arrow/Kierulff Electronics
602-437-0750

TEMPE
Bell Industries
602-966-7800

CALIFORNIA (Southern)
EL SEGUNDO
Force Electronics
213-772-1324

GARDEN GROVE
Bell Industries
714-220-0681

GARDENA
Bell Industries
213-515-1800 or
818-444-0301

IRVINE
Acacia/VWR Electronics
714-660-0834

LOS ANGELES
Arrow/Kierulff Electronics
818-701-7500

SAN DIEGO
Acacia/VWR Electronics
619-565-4365

Arrow/Kierulff Electronics
619-565-4800

Bell Industries
619-268-1277

Force Electronics
619-569-9661

SUNNYVALE
Bell Industries
408-734-8570

Bell Industries–
Cable & Components
408-745-0400

THOUSAND OAKS
Bell Industries
805-499-6821

TUSTIN
Arrow/Kierulff Electronics
714-838-5422

CALIFORNIA (Northern)
MOUNTAIN VIEW
Bell Industries
415-960-1440

ROSEVILLE
Bell Industries
916-969-3100

SAN CARLOS
Lo Dan Electronics
415-592-4600 or
800-541-1001 (Out of State)

SAN FRANCISCO
Arrow/Kierulff Electronics
408-245-6600

SAN JOSE
Force Electronics
408-435-1324

COLORADO
DENVER
Arrow/Kierulff Electronics
303-790-4444

Bell Industries
303-424-1985

CONNECTICUT
WALLINGFORD
Almo Electronics
203-269-6801

Arrow/Kierulff Electronics
203-265-7741

Sager
203-265-4600

FLORIDA
FT. LAUDERDALE
Arrow/Kierulff Electronics
305-429-8200

Hammond Electronics
305-973-7103

LARGO
Lo Dan Electronics
813-586-2851 or
800-282-6789 (Florida Only)

MELBOURNE
Arrow/Kierulff Electronics
407-725-1480

ORLANDO
Arrow/Kierulff Electronics
305-682-6923

Hammond Electronics
407-849-6060

GEORGIA
ATLANTA
Arrow/Kierulff Electronics
407-449-8252

Bell Industries
404-662-0923

Hammond Electronics
404-449-1996

ILLINOIS
CHICAGO
Arrow/Kierulff Electronics
312-250-0500

Lo Dan Electronics
312-398-5311 or
800-323-5207 (Out of State)

Newark Electronics
312-784-5100

URBANA
Bell Industries
217-328-1077

INDIANA
FORT WAYNE
Bell Industries–Graham Div.
219-423-3422

INDIANAPOLIS
Arrow/Kierulff Electronics
317-299-5487

Bell Industries–Graham Div.
317-875-8200

Bell Industries–JIT Div.
317-299-5487

IOWA
CEDAR RAPIDS
Arrow/Kierulff Electronics
319-395-7230

Bell Industries
319-395-0730

KANSAS
EDWARDSVILLE
Tennant Electronics
913-441-1801

KANSAS CITY
Arrow/Kierulff Electronics
913-541-9542

MARYLAND
BALTIMORE
Arrow/Kierulff Electronics
301-995-6002

Resco/Baltimore
301-529-0500 or
800-638-1242

WASHINGTON, D.C.
Almo Electronics
301-670-0090

Resco/Washington
301-937-9100

MASSACHUSETTS
BOSTON
Almo Electronics
617-821-1450

Arrow/Kierulff Electronics
617-935-5134

Sager
617-749-6700

MICHIGAN
ANN ARBOR
Bell Industries
313-971-9093

DETROIT
Arrow/Kierulff Electronics
313-971-8220

FARMINGTON HILLS
LSI Marketing
313-553-7800

GRAND RAPIDS
Arrow/Kierulff Electronics
616-243-0912

MINNESOTA
MINNEAPOLIS
Aero-Space Computer Supply
612-884-4725

Arrow/Kierulff Electronics
612-380-1800

MISSOURI
ST. LOUIS
Arrow/Kierulff Electronics
314-567-6888

NEW HAMPSHIRE
MANCHESTER
Arrow/Kierulff Electronics
603-668-6968

NEW JERSEY
EAST BRUNSWICK
Almo Electronics
201-613-0200

MARLTON
Arrow/Kierulff Electronics
609-596-8000

PARSIPPANY
Arrow/Kierulff Electronics
201-538-0900

NEW MEXICO
ALBUQUERQUE
Arrow/Kierulff Electronics
505-243-4566

Bell Industries
505-292-2700

NEW YORK
HAUPPAUGE
Arrow/Kierulff Electronics
516-231-1000

Sager
516-348-1300

ROCHESTER
Arrow/Kierulff Electronics
716-427-0300

RONKONKOMA
Conco Electronics
516-467-8200

NORTH CAROLINA
GREENSBORO
Hammond Electronics
919-275-6391

RALEIGH
Arrow/Kierulff Electronics
919-876-3132

WINSTON-SALEM
Arrow/Kierulff Electronics
919-725-8711

OHIO
AKRON
AESCO Electronics
216-762-8818

CLEVELAND
Arrow/Kierulff Electronics
216-248-3990

COLUMBUS
Arrow/Kierulff Electronics
614-436-0928

DAYTON
Arrow/Kierulff Electronics
513-435-5563

Bell-Day Division (Military)
513-434-8231

OKLAHOMA
TULSA
Arrow/Kierulff Electronics
918-252-7537

Norvell Electronics
918-254-8606

OREGON
LAKE OSWEGO
Bell Industries
503-241-4115

PORTLAND
Arrow/Kierulff Electronics
503-645-6456

PENNSYLVANIA
PHILADELPHIA
Almo Electronics
215-698-4000

Arrow/Kierulff Electronics
215-928-1800

PITTSBURGH
Almo Electronics
412-931-5990

Arrow/Kierulff Electronics
412-856-7000

TENNESSEE
Hammond Electronics
800-334-0267

TEXAS
AUSTIN
Arrow/Kierulff Electronics
512-835-4180

Norvell Electronics
512-837-5555

DALLAS
Arrow/Kierulff Electronics
214-380-6464

Force Electronics
214-247-9955

Norvell Electronics
214-233-0020

HOUSTON
Arrow/Kierulff Electronics
713-530-4700

Force Electronics
713-561-8644

Norvell Electronics
713-777-1666

UTAH
SALT LAKE CITY
Arrow/Kierulff Electronics
801-973-6913

Bell Industries
801-972-6969

WASHINGTON
SEATTLE
Arrow/Kierulff Electronics
206-575-4420

Bell Industries
206-747-1515

WISCONSIN
MILWAUKEE
Arrow/Kierulff Electronics
414-792-0150

Bell Industries
414-547-8879

For high quality connectors there's no need to look any further than Du Pont Electronics ... and the best distributors in the business.

We're more than just partners. Together, we're your assurance of fast delivery with the convenience of dealing with a local source, and a wide range of product choices.

Call one of the authorized distributors listed. They're your connection to the best connectors in the business from the best name in the business. Du Pont Electronics, Room G51680, Route 141 & Lancaster Pike, P.O. Box 80029, Wilmington, DE 19880-0029.

1-800-237-4357

Du Pont Electronics
Share the power of our resources.

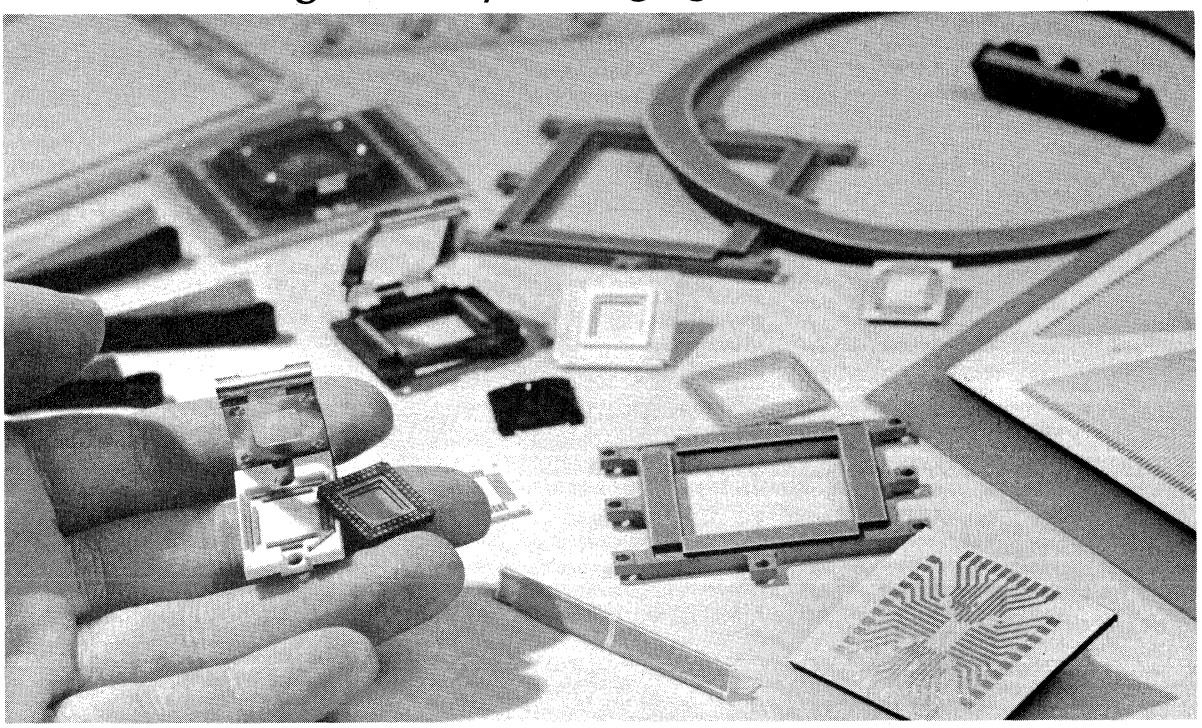
DU PONT

WIRE GAUGES— DIAMETER, AREA AND COPPER WEIGHT

	Diameter at 20°C (68°F)		Area at 20°C (68°F)			Weight at 20°C (68°F), bare copper wire		
Size, AWG	mils	mm	mils	c mils	mm	lb/1,000 ft.	lb/mile	kg/km
4/0	460.0	11.68	166,200	211,600	107.2	640.5	3,382	953.2
3/0	409.6	10.40	131,800	167,800	85.01	507.8	2,681	755.7
2/0	364.8	9.266	104,500	133,100	67.43	402.8	2,127	599.5
1/0	324.9	8.252	82,891	105,600	53.49	319.5	1,687	477.6
1	289.3	7.348	85,730	83,690	42.41	253.3	1,338	337.0
2	257.6	6.543	52,120	66,360	33.62	200.9	1,061	298.9
3	229.4	5.827	41,330	52,620	26.67	159.3	841.1	237.1
4	204.3	5.189	32,780	41,740	21.15	126.3	667.1	188.0
5	181.9	4.620	25,990	33,090	16.77	100.2	528.8	149.0
6	162.0	4.115	20,610	26,240	13.30	79.44	419.4	118.2
7	144.3	3.665	16,350	20,820	10.55	63.03	332.8	93.80
8	128.5	3.264	12,970	16,510	8.367	49.98	263.9	74.38
9	114.4	2.906	10,280	13,090	6.631	39.61	209.2	58.95
10	101.9	2.588	8,155	10,380	5.261	31.43	166.0	46.77
11	90.7	2.304	6,460	8,230	4.17	24.90	131	37.1
12	80	2.05	5,130	6,530	3.310	19.8	104	29.4
13	72.0	1.83	4,070	5,180	2.63	15.7	82.9	23.4
14	64.1	1.63	3,230	4,110	2.08	12.4	65.7	18.5
15	57.1	1.45	2,560	3,260	1.650	9.87	52.1	14.7
16	50.8	1.29	2,030	2,580	1.31	7.81	41.2	11.6
17	45.3	1.150	1,610	2,050	1.040	6.21	32.8	9.24
18	40.3	1.02	1,280	1,620	0.823	4.92	26.0	7.32
19	35.9	0.912	1,010	1,290	0.653	3.90	20.6	5.81
20	32.0	0.813	804.0	1,020	0.519	3.10	16.4	4.61
21	28.5	0.724	638.0	812.0	0.412	2.46	13.0	3.66
22	25.3	0.643	503.0	640.0	0.324	1.94	10.2	2.88
23	22.6	0.574	401.0	511.0	0.259	1.55	8.16	2.30
24	20.1	0.511	317.0	404.0	0.205	1.22	6.46	1.82
25	17.9	0.455	252.0	320.0	0.162	0.970	5.12	1.44
26	15.9	0.404	199.0	253.0	0.128	0.765	4.04	1.14
27	14.2	0.361	158.0	202.0	0.102	0.610	3.22	0.908
28	12.6	0.320	125	159.0	0.0804	0.481	2.54	0.715
29	11.3	0.287	100.0	128.0	0.0647	0.387	2.04	0.575
30	10.0	0.254	78.50	100.0	0.0507	0.303	1.60	0.450
31	8.9	0.226	62.20	79.2	0.0401	0.240	1.27	0.357
32	8.0	0.203	50.30	64.0	0.0324	0.194	1.02	0.288
33	7.1	0.180	39.60	50.40	0.0255	0.153	0.806	0.227
34	6.3	0.160	31.20	39.7	0.0201	0.120	0.634	0.179
35	5.6	0.142	24.60	31.4	0.0159	0.0940	0.501	0.141
36	5.0	0.127	19.60	25.00	0.0127	0.0757	0.400	0.113
37	4.50	0.114	15.90	20.20	0.0103	0.0613	0.324	0.0912
38	4.0	0.102	12.60	16.0	0.00811	0.0484	0.256	0.0721
39	3.5	0.0889	9.62	12.2	0.00621	0.0371	0.196	0.0552
40	3.1	0.0787	7.55	9.61	0.00487	0.0291	0.154	0.0433
41	2.8	0.0711	6.16	7.84	0.00397	0.0237	0.125	0.0353
42	2.5	0.0635	4.91	6.25	0.00317	0.0189	0.0999	0.0282
43	2.2	0.0559	3.80	4.84	0.00245	0.0147	0.0774	0.0218
44	2.0	0.0508	3.14	4.00	0.00203	0.0121	0.0639	0.0180
45	1.8	0.0457	2.54	3.24	0.00164	0.00981	0.0519	0.0146
46	1.6	0.0406	2.01	2.56	0.00130	0.00775	0.0409	0.0115
47	1.4	0.0356	1.54	1.96	0.000993	0.00593	0.0313	0.00883
48	1.2	0.0305	1.13	1.44	0.000730	0.00436	0.0230	0.00649
49	1.1	0.0279	0.950	1.21	0.000613	0.00366	0.0193	0.00545
50	1.0	0.0254	0.785	1.00	0.000507	0.00303	0.0160	0.00450

ENGINEERED SOLUTIONS

For *Reliable* High Density Packaging Without *Solder* or *Pins!*



Elastomeric Connectors From ETI For:

- ☐ **Surface Mount Compatibility**
- ☐ **High Contact Density**
- ☐ **Remateability**
- ☐ **Environmental Contact Sealing**
- ☐ **Low Profile Board Spacing**
- ☐ **High Speed Compatibility**

High density packaging without solder or pins...sounds almost too good to be true, but in fact, it's something we've been doing for many years. At ETI, we make it possible through the use of elastomeric connectors which have proven, long-term reliability in a variety of applications. Our technology enables us to design unique inter-connection systems that solve a wide range of packaging problems, such as connections for board-to-board, chip-carrier sockets, test fixtures, flat-panel displays, etc.

Elastomeric connector elements are available in two types; STAX and MOEs (Metal On Elastomers). STAX are composed of alternating layers of conductive and non-conductive silicone rubber. Silver is used as the conductive material where low resistance contact is desired, while carbon is used for higher resistance contact to liquid crystal displays. MOEs have metal traces deposited on a silicone substrate, providing either redundant or dedicated paths for low resistance connection.

STAX and MOEs create reliable contact when clamped between closely spaced pads on mated substrates. Gas tight seals exclude harsh environments over a wide temperature range. Silicone rubber's superior electrical properties ensure low capacitance and dielectric loss over the entire temperature range at up to 100% relative humidity.

ELASTOMERIC TECHNOLOGIES, INC.

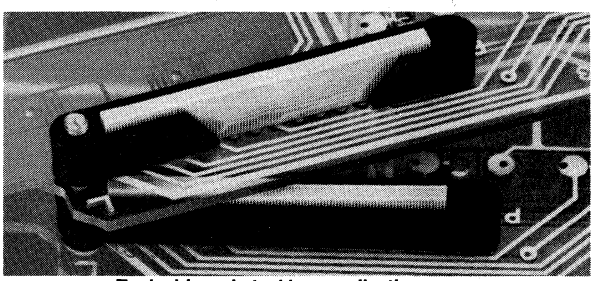
2940 TURNPIKE DRIVE, HATBORO, PA 19040 • TEL.215/672-0787 • TLX.387236 • FAX 215/672-4633

LET US DESIGN AN ELASTOMERIC INTERCONNECTION SYSTEM FOR ALL YOUR PACKAGING NEEDS

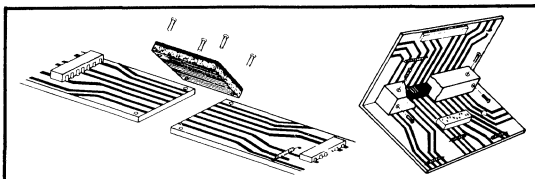
Here are some typical applications

☐ Board-to-Board

Board interconnection is easy with elastomeric connectors. The STAX and MOEs provide redundant connections when compressed between surface contact pads as tightly spaced as .025" center-to-center. We can design and provide an entire connection system including holders, hardware, and board layout. STAX and MOEs make it easy and cost effective.



Typical board-stacking application

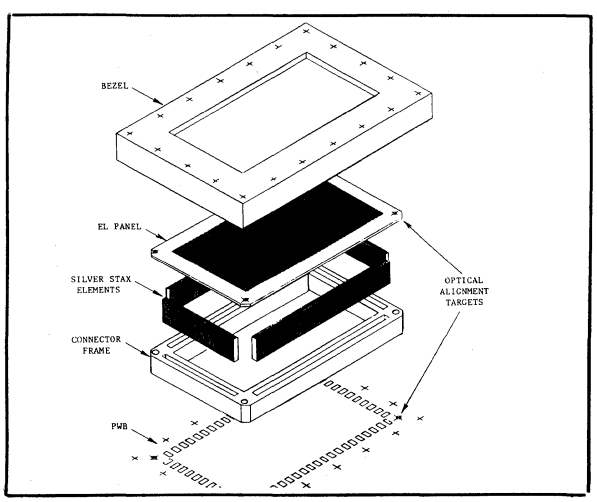


Typical coplanar connection

Typical right angle connection

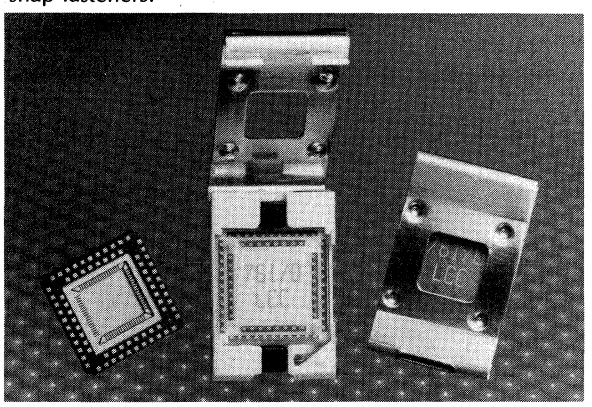
☐ Flat Panel Displays

Elastomeric Connectors provide redundant connections to tightly spaced pads on Electroluminescent, Plasma, Liquid Crystal, LED, and other displays while sealing out contaminates and making alignment less critical.



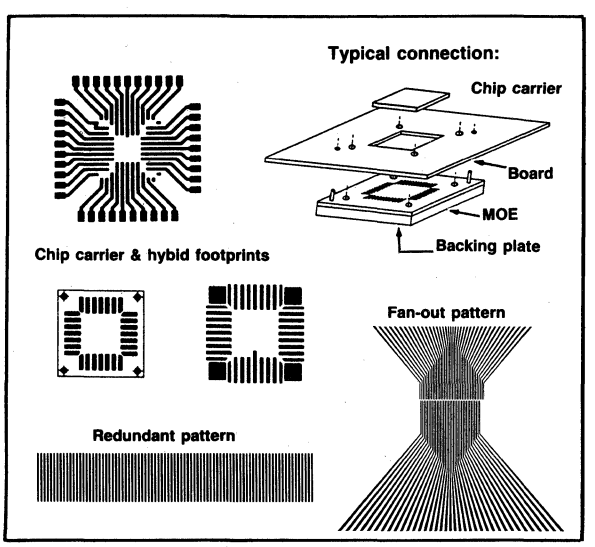
☐ Chip Carrier Sockets

By eliminating soldering and plated through-holes, leadless chip carrier sockets that use STAX or MOEs simplify assembly and replacement, while saving considerable board real estate. The use of Silver STAX also allows very low profile packages. Lead lengths can be shortened to reduce inductance for high speed compatability. Several mounting options are possible including screws, eyelets, rivets, and snap fasteners.



☐ Test Fixtures

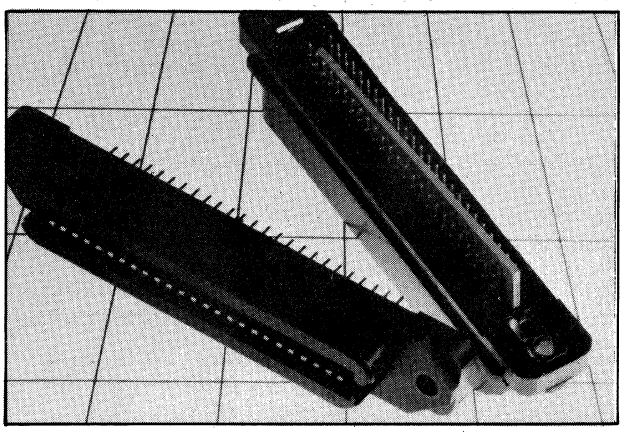
MOEs maintain low resistance, repeatable connections through a broad temperature range, making them ideal for test applications. Since their patterns are artwork generated, they are readily adaptable to a wide variety of devices and substrates such as hybrids, chip carriers, etc. Below are just some of the types of patterns used in test applications. Let the Applications Engineering Department at ETI show you how to use MOE's for your testing requirements.



ETI™

2940 Turnpike Drive, Hatboro, PA 19040
Phone: (215) 672-0787, or (215) 672-4741
FAX: 215-672-4633 TWX: 510 387236

Discrete Connectors from Elfab



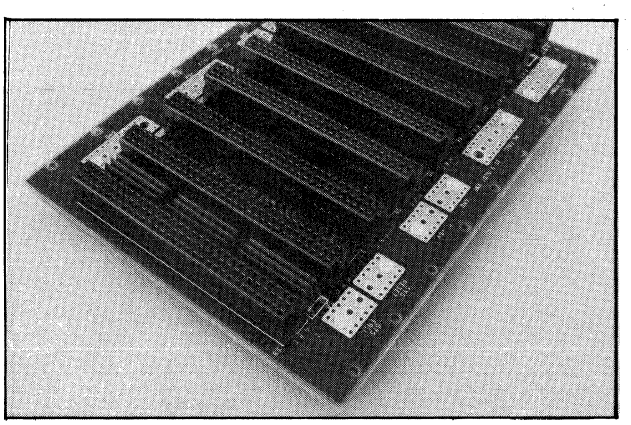
Tele Pac®

Used throughout the telecommunications industry in a variety of applications, the Tele Pac® connector mates with other industry standard connectors of its type. Tele Pac® is available in both solder and press fit styles with an all plastic housing. Although this PCB mounted connector is primarily intended as an I/O interface (cable to board), it can also be used as a board to board interface.

Adding a capacitor element to the standard version provides an EMI/RFI filtering capability which can eliminate the need for expensive shielded cable.

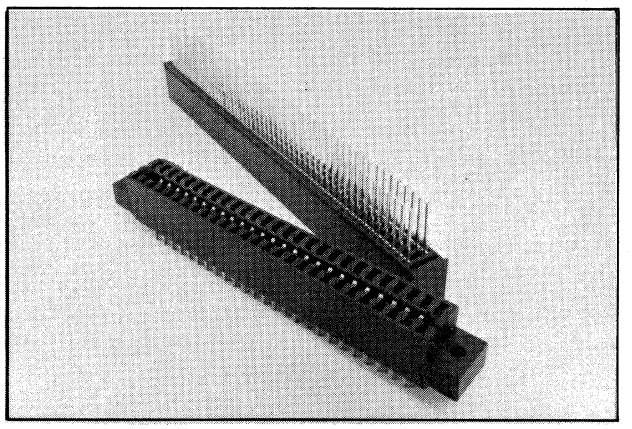
FEATURES:

- Press fit assembly without "special" assembly tooling. Only a flat plate press and board support fixture are required for assembly of press fit connectors
- Custom filters available for EMI/RFI "noise" suppression



VME Backplane

Elfab VME backplanes are designed to meet industry standard requirements. They are offered in 5, 9, 12, 20 and 21 slot configurations. Our VME backplanes are 100% electrically tested prior to leaving our factory to ensure total reliability.



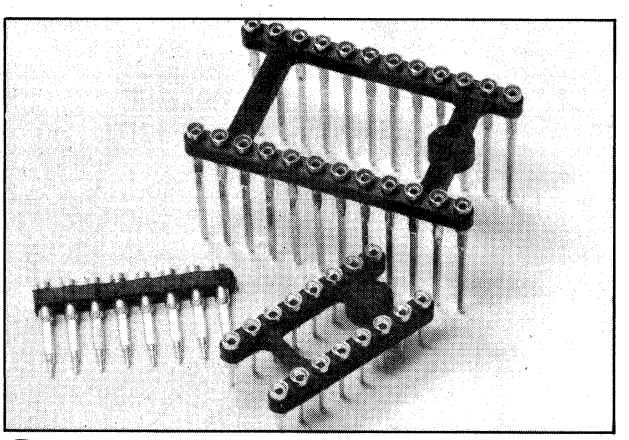
Value Pac™

Value Pac™ card edge connectors are available in solder and compliant pin press fit styles with a variety of tail lengths to provide direct interchangeability with most currently available connectors.

For the ultimate in simplicity, the assembly of press fit connectors requires only a flat plate to press directly on top of the insulator housing. No special tooling is required.

FEATURES:

- Available in three grid sizes: .100 × .200, .125 × .250, .156 × .200
- Available in both .550 and .610 high housings with .410 card slot depth
- Selective plating for efficient gold use



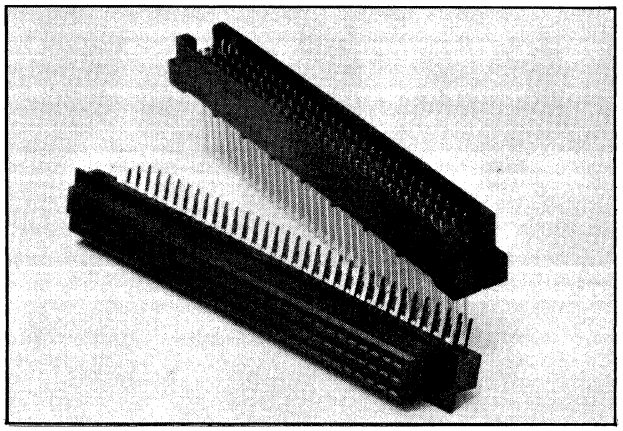
Soc Pac®

Soc Pac® precision I.C. socket connectors are available in either standard SIP or DIP configurations as well as loose pins. All connector sizes are available in standard solder or new press fit styles with 0, 2, or 3 level wire wrap tail lengths.

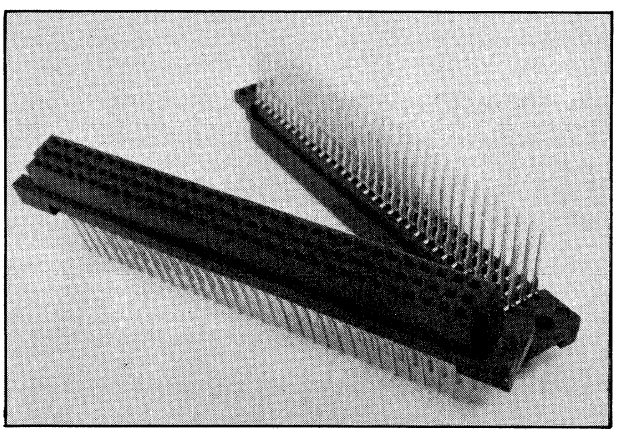
FEATURES:

- Precision machined brass body
- Beryllium copper spring contact
- 100% oriented contact clip
- Wire wrap tail allows rear plug up of box connectors

Discrete Connectors from Elfab



Inverse DIN



Standard DIN

DIN Connectors

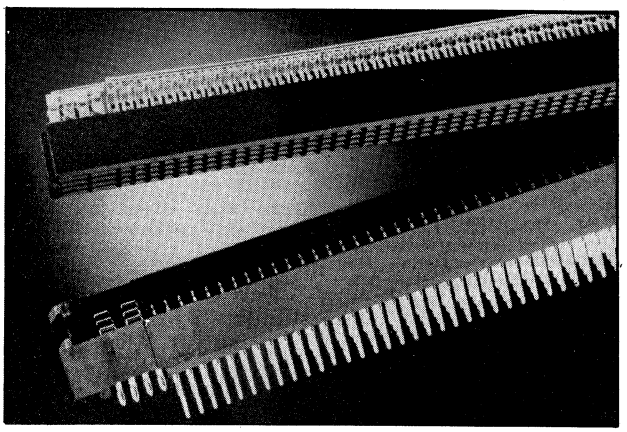
The DIN connectors are primarily used as a board to board interface system. These connectors are directly interchangeable with others designed to meet the international DIN 41612 standards. The standard and inverse versions differ only in the placement of the plug and receptacle connectors. In the standard application, the receptacle or female connector is backplane or rack mounted. In the inverse application, the plug or male connector is utilized in this location. Backplane mounted connectors in both versions are offered in either solder or compliant pin press fit styles. The DIN series is an excellent alternative to a card edge connector system as it offers greater contact density and lower insertion forces at comparable per line cost.

FEATURES:

- Rear shrouds available for rear cable or board interface
- Solder and wire wrap tails available

AUGAT®

Quality and Innovation

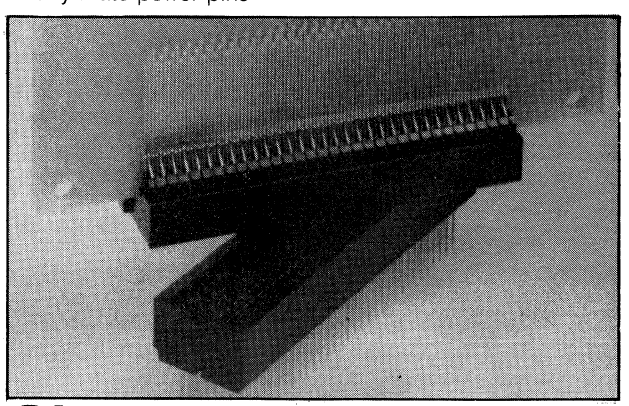


Four Row Box Pac™

The Four Row Box Pac™ high density interconnect system has 4 rows on .100 grid. This system allows for the shortest conductor path between module board and backpanel, with consistency of distance between all four rows. The female surface mount adapts to either vapor phase or reflow soldering. The male is available in either press fit or solder tail.

FEATURES:

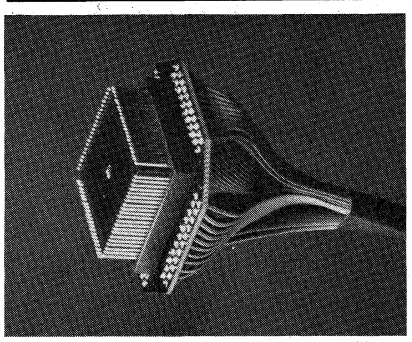
- Optional power and ground busses
- Optional keying
- Low insertion force
- Early mate power pins



Six Row "Double-Din"

The six row version of the Four Row Box Pac (above) is double the density of a standard DIN connector. Available immediately from production with 6 rows, 32 pins per row. Female surface mount connector allows for the shortest conductor path between module board and backpanel with consistency of distance between all 6 rows. It adapts to either vapor phase or reflow solder. The male connector is available in either press fit or solder tail.

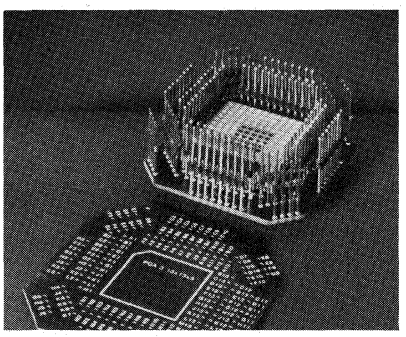
For more information call: (508) 222-2202
33 Perry Avenue, Attleboro, Mass 02703



Easy Emulator Pods & Adapters

- Plug your PLCC and LCC packages into your PC board in minutes, with these easy-to-use adapters.
- Emulator/logic analyzer users: Adapt-a-Pod™ converts one package type to another (LCC, PLCC, PGA, and DIPs).
- Emulator pods and adapters are available in all standard pin counts, with ribbon or ribbon cable headers.
- Custom engineering services and do-it-yourself emulator pod converters. Free catalog.

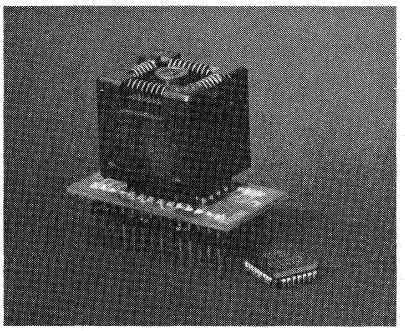
Emulation Technology, Inc.
2368-B Walsh Ave. Santa Clara, CA 95051
Phone: 408-982-0660 FAX: 408-982-0664



Complete Line of Debug Tools

- Famous Bug Katcher™ makes it easy to attach test leads to ICs in LCC, PLCC, PGA, PQFP, and DIP packages.
- Eliminates need for noisy cables; reduces capacitance and inductance in your test set-up.
- You can also quickly isolate and reconnect sections of your socketed IC with our Bug Isolator.™ (All packages.)
- Quick turnaround on custom engineering services, if needed. For a free catalog, contact:

Emulation Technology, Inc.
2368-B Walsh Ave. Santa Clara, CA 95051
Phone: 408-982-0660 FAX: 408-982-0664



PAL/PROM Programmer Adapters

- Any EPROM programmer designed for DIPs can be converted to accept LCC, PLCC, and SOIC sockets in seconds!
- To program, just insert an Adapt-A-Socket™ between the programmer's DIP socket and the circuit to be programmed.
- Designed to fit all types of EPROM programmers, including Data I/O 120/121A, Stag, Logical Devices, etc.
- Quick turnaround on custom engineering services, if needed. For a free catalog, contact:

Emulation Technology, Inc.
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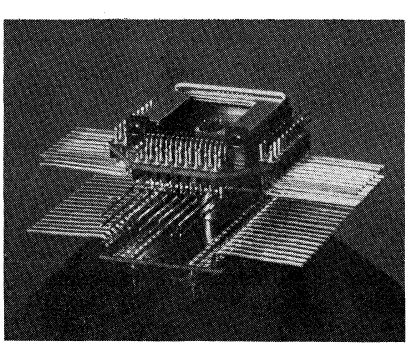
Now you can connect any VLSI or surface mount circuit to any other type of circuit—or test equipment—thanks to our complete line of adapters, connectors, and test clips. Solve *your* "wrong prong" problem—contact us today for a *free catalog!*

Wrong Prong?



Quick, Fast Socket Conversion

- Convert-A-Socket™ makes it a snap to convert a production socket to a test socket and vice-versa.
- Complete line of male/female sockets for LCC, PLCC, PGA, PQFP, and DIP circuits.
- A must if you're inserting circuits repeatedly in low insertion force sockets.
- Quick turnaround on custom engineering services, if needed. For a free catalog, contact:

Emulation Technology, Inc.
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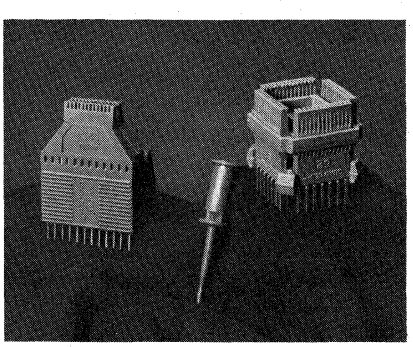
Phone: 408-982-0660 FAX: 408-982-0664



Quality Debugging Accessories

- Protect your ICs from damage. Insert and extract LCC, PLCC, PGA, and PQFP packages with the right tool.
- Use receptacle boards to build test fixtures, and mount your test equipment, in half the time.
- Get the right production sockets, burn-in sockets, test leads, and test clips for SMT, SOIC, or PLCC circuits.
- Quick turnaround on custom engineering services, if needed. For a free catalog, contact:

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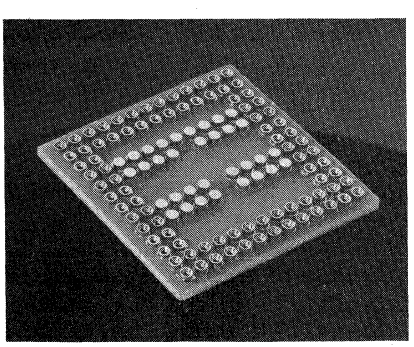


Over 150 Prototyping Adapters

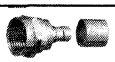
- Adapt-A-Boards™ make it easy to adapt standard or high-density prototyping boards to a variety of packages.
- For all package types: LCC, PLCC, PGA, PQFP, SDIP (shrink DIP devices), SOIC and more!
- Bottom configurations adapt to wire wraps or solder tail pins. Boards conform to Mil-C-45204.
- Quick turnaround on custom engineering services, if needed. For a free catalog, contact:

Emulation Technology, Inc.
2368-B Walsh Ave. Santa Clara, CA 95051
Phone: 408-982-0660 FAX: 408-982-0664

EPD
ELECTRONICS INC.
P.O. BOX 2517, GARDENA, CA 90247
16921 S. Western Ave., No. 110, Gardena, CA 90247 (213) 515-4996

CONNECTORS AND ADAPTERS

850(F59)



"F" Male plug for RG-59U cable with ¼" ring

851(F59)

"F" Male ring attached for RG-59U cable

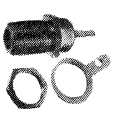
815

RCA Phono plug with crimping ring for RG-59U cable

861(F61)

"F" Type female chassis mount. ⅜" mount. hole

861A(F61)

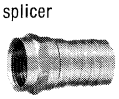


"F Type female chassis mount. With back screw

848(F81)

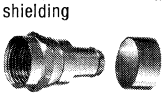
"F" Dual female splicer

851C(F59)



"F" Male with long crimping barrel, for RG-59U cable. Suitable for coax with foil type shielding

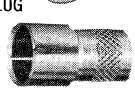
816(F56)



"F" Male plug for RG-6/U cable with ¼" ring

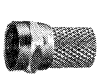
NUTS
WASHER
SOLDER LUG

863



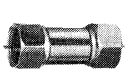
"F" Type solderless push on plug for RG-59U cable. Strip cable and screw on

863A



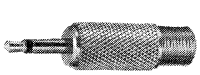
"F" Type solderless screw on for RG-59U cable. Strip and screw on cable

848M(F71)



"F" Type dual male splicer

854

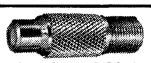


⅛" Mini phone plug to "F" type female

855

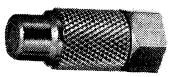
Right angle "F" male to "F" female

856



"F" Type female to RCA female

858

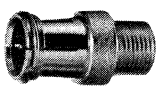


RCA Type female to "F" male adapter

860

"F" Type female to RCA male adapter

853

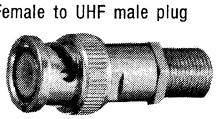


"F" Type push on male to female

862

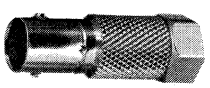
"F" Female to UHF male plug

864



"F" Type female to BNC male

865



"F" Male to BNC female

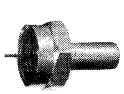
890

Push on balum matching transformer 75-300 ohm for UHF/VHF/FM

840

75-300 Ohm balum matching transformer UHF/VHF/FM

852



"F" Type 75 ohm terminator

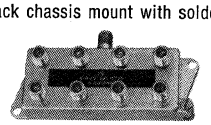
326

¼" mini phone plug to RCA phono jack

500

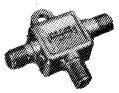
RCA Jack chassis mount with solder lug

846



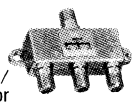
8-Way splitter. UHF/VHF indoor/outdoor 75 ohm signal splitter

842



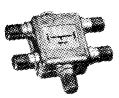
2-Way splitter. UHF/VHF indoor/outdoor 75 ohm signal splitter

843



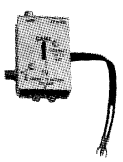
3-Way splitter. UHF/VHF indoor/outdoor 75 ohm signal splitter

844



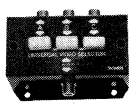
4-Way splitter. UHF/VHF indoor/outdoor 75 ohm signal splitter

898



TV Game switch. Select your game or TV for instant viewing. 300/75 ohm input, 300 ohm output lead

811

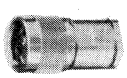


ABC Switch. Shielded low loss switcher. "F" type connector. Permits instant selection of 3 different signals

899

Crimping tool for "F" connector

N-101(UG-21)



Male standard clamp
GOLD PLATED CONTACTS

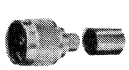
N-101A (UG-536B/U)

Male standard clamp
GOLD PLATED CONTACTS

N-101B (UG-21) LONG

Male standard clamp
GOLD PLATED CONTACTS

N-102

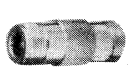


Male mil crimp
GOLD PLATED CONTACTS

N-105 (UG-58B/U)

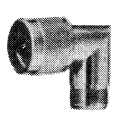
Standard panel female square mount
GOLD PLATED CONTACTS

N-111 (UG-29B/U)



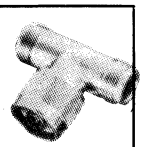
Inline female to female
GOLD PLATED CONTACTS

N-112 (UG-27B/U)



Right angle male to female
GOLD PLATED CONTACTS

N-216 (UG-107/U)



Tee female-male-female

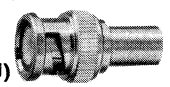
N-207 (UG-201/U)

Male N to female BNC

N-208 (UG-349/U)

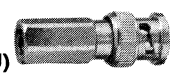
Female N to BNC male

B-135A (For RG59/U)



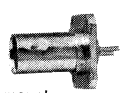
BNC Male with crimp ferrell attached

B-191 (For RG59/U)



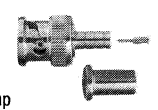
BNC male twist on cable

B-193



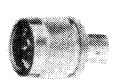
BNC Female chassis mount

B-220 (For RG58/U)



BNC Male with crimp ferrel

N-207 (UG-201/U)



Male N to female BNC

N-208 (UG-349/U)

Female N to BNC male

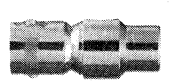
864

"F" Type female to BNC male

865

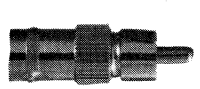
"F" Male to RCA female

867



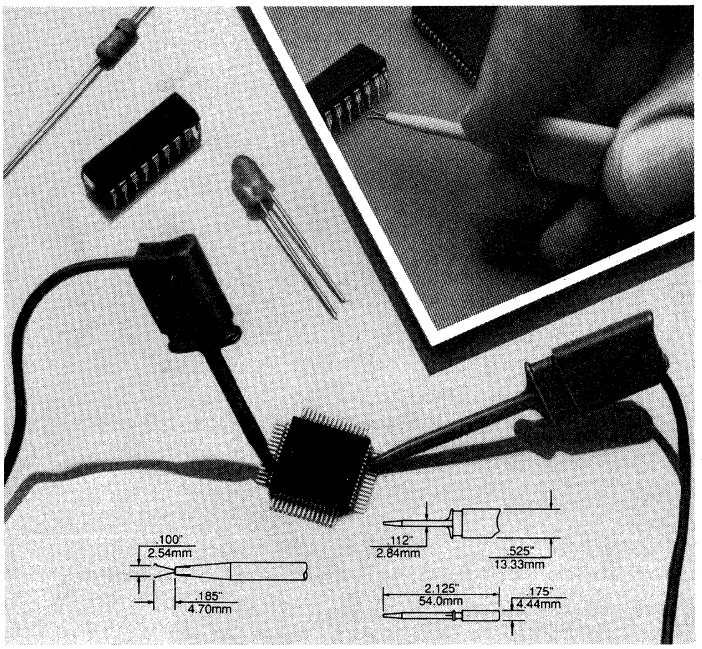
BNC Female to RCA female

868



BNC Female to male RCA

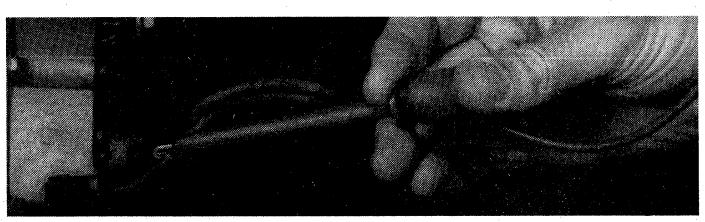
E-Z-HOOK® ELECTRONIC TEST ACCESSORIES



MICRO XK DOUBLE GRIPPER. ACCURATE CONTACT FOR HIGH DENSITY / SURFACE MOUNT

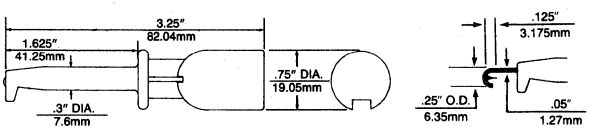
Makes positive contact even on smallest leads, including hard to make test connections in tightest spots. Two stainless steel contact blades assure accurate contact, opening under compression spring, closing firmly around lead upon release.

Small and narrow, the XK MICRO DOUBLE-GRIPPER stacks side-by-side for high density ICs. And, it's an excellent choice for surface-mount devices. Direct contact-to-lead wire integrity. Durable Nylon housing can be color coded in 1,000 combinations. Available in choice of standard test lead assemblies (XK to banana, pin, alligator clip, 6-32 female thread jack, stacking and meter banana plugs); assortment set of 1 each of 10 colors (XK-S).

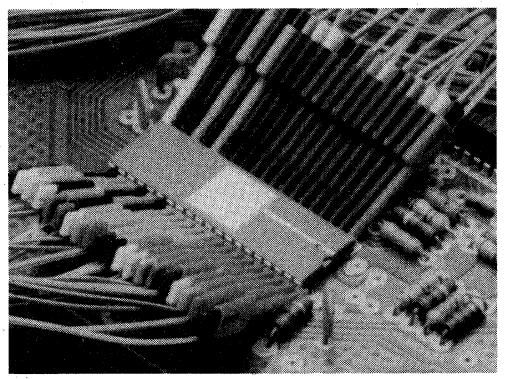


MACRO XJ/XJL. HEAVY DUTY INSULATION PIERCING

Ideal for heavy-gauge wire and cable, lugs and terminals. Two standard probe tip lengths (XJ, 1.625"/XJL, 3.85"). An insulation piercing needle inside the hook assures positive electrical contact. Heavy-duty, spring-loaded and insulated to a single contact point. Durable nylon housing. Available in a variety of standard test lead assemblies (same as XK, plus variety of shrouded banana plugs). 1,000 color combinations.

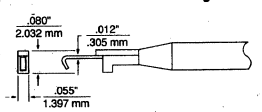


Specifications Subject to Change Without Notice © 1989, E-Z Hook



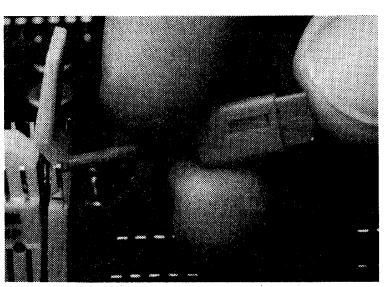
PICO-HOOK™. HIGH DENSITY TEST LEADS. COLOR CODED.

Small and narrow, an excellent test connector for high density contact such as ICs. One-piece Beryllium Copper Gold Plated conductor and hook per MIL-G-45204 assures signal accuracy. Ultra-thin



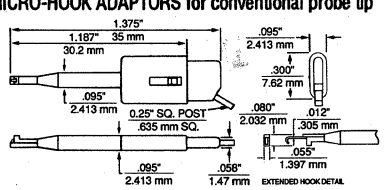
EXTENDED HOOK DETAIL

blade fits between narrow test points. Compression spring loaded. Available in 10 standard colors (black, brown, red, orange, yellow, green, blue, violet, gray, white) plus KILO-COLOR™. Available in standard test lead assemblies (PICO-HOOK to PICO-HOOK, PICO to .025" (.635mm) square socket, or non-interface lead wire assembly). Design accommodates variety of different lead wires, and can be factory installed to meet specific applications (maxium wire size 24 AWG with .060" dia. insulation).



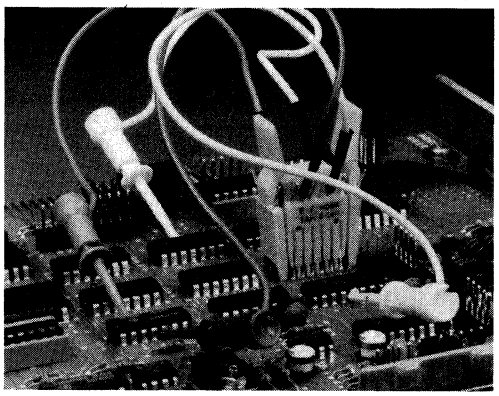
P-25. A PICO-HOOK® YOU CAN PLUG ON IN ANY COLOR YOU WANT

A uniquely versatile adaptation of the PICO-HOOK, the P-25 PICO-HOOK ADAPTOR provides a .025" (.635mm) square male pin for reliable connections with field replaceable leads. Available in same color combinations as PICO-HOOK. Variety of .025" Patch Cords and Adaptors (socket-to-pin plug, standard and meter banana plugs, 6-32 thread jack, alligator clips, banana socket). Also see E-Z Hook XM25 MICRO-HOOK ADAPTORS for conventional probe tip configuration.



E-Z HOOK, A Division of Tektest, Inc., Arcadia, CA 91006. P.O. Box 450. (818) 446-6175 FAX (818) 446-0972.

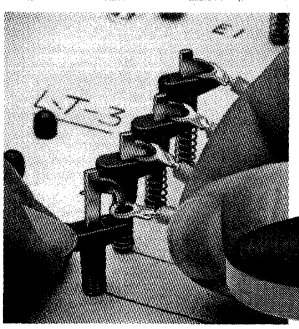
PROBES, TEST LEADS, INTERFACE CONNECTORS



MULTI-TEST LEAD ASSEMBLIES AND TAP-A-DIP™ TEST CONNECTORS

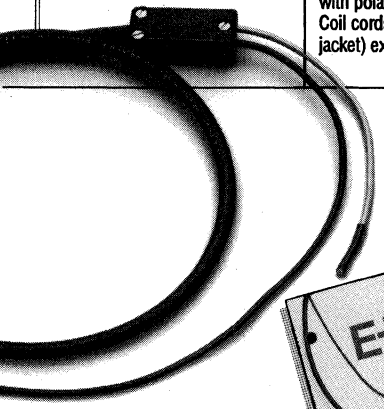
E-Z Hook provides one of industry's largest selections of standard multi-lead assemblies in 14 and 16 lead sets and jumpers, made up of E-Z MICRO-HOOK, XM MICRO-HOOK (to .025" sq. sockets), MINI-HOOK, and PICO-HOOK Test Connectors. Lead wire lengths can be ordered in 6" to 60", depending on assembly. Available in up to 1,000 colors.

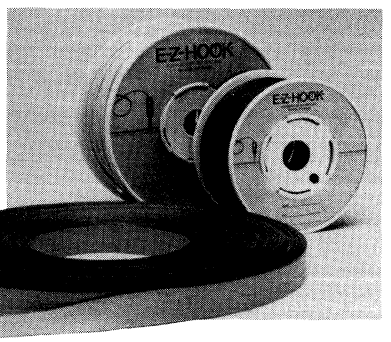
A perfect mate to test lead sets, E-Z Hook's TAP-A-DIP provides 14 (P/N 300-14) and 16 (P/N 300-16) I.C. pin contacts in a simple, positive lock-on design with gold plated contact springs for accurate contact.



E-Z NAIL CLIP™ TEST TERMINAL

Use these versatile Terminal Connectors to hold wire ends firmly in place. 4 standard models. Saves construction time for bread boarding and harness board connections. Drive into wood like a nail, or press into pre-drilled holes. Solderable for below-board connections. Spring loaded hook/slide assembly. 10-colors.



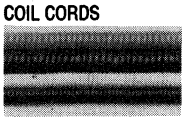


QUALITY WIRE/LEAD AND COIL CORD

10 colors of standard straight test lead wire in reels or specified lead lengths (28 AWG x 19 x 40; 22 AWG 65 x 40; 18 AWG 65 x 36; thermoplastic insulated; 24 AWG 19 x 36 Teflon; and 28 AWG 7 x 36 laminated PVC ribbon insulated). Ribbon cable available in solid color with polarity stripe. Coil cords (urethane jacket) extend to 60".

STRAIGHT LEADWIRE

COIL CORDS

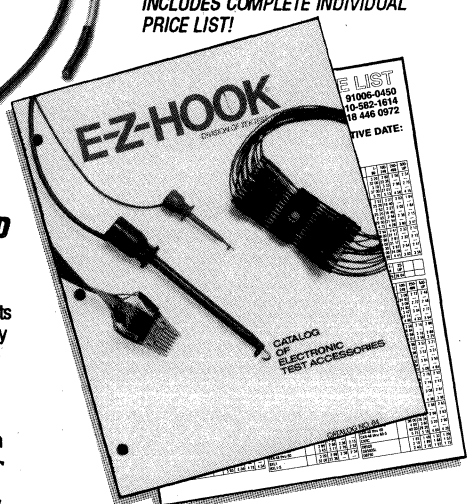


COAXIAL TEST ACCESSORIES, PATCH CORDS, PHONE PLUGS AND BINDING POSTS

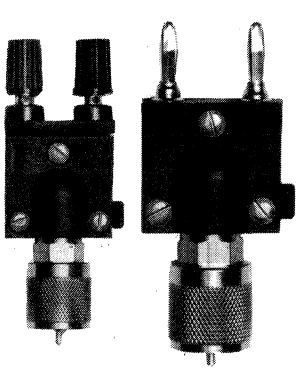
A complete selection of most popular types of coaxial test cables in standard sets; Hook, Coaxial Cable, Adaptors, Patch Cords, Video Patch Cords and Plugs, and individual interface components. If standard sets won't meet your requirements, immediate response to special configurations is assured. All E-Z Hook components feature complete field serviceability.

NEW 112-PAGE CATALOG FEATURES 12,000 LOW-COST PRODUCTS

INCLUDES COMPLETE INDIVIDUAL PRICE LIST!



TYPE "N", TNC, BNC, SMA/UHF POST/PLUG CONNECTORS



Supplied individually or in cable assemblies, choose from a variety of industry's most popular type N, TNC, BNC, SMA/UHF connectors and LOC plugs, attenuators and terminators. These same configurations are available in Banana Plug and Binding Post Adaptors. See catalog for WE310 (PJ51) plug to Bantam Adaptors and E-Z FLEX™ Test Adaptors for cylindrical connector test pin male/female testing.

EVERYTHING'S INCLUDED IN THE E-Z HOOK CATALOG!

Over 12,000 standard test components and assemblies. Each detailed for easy ordering with individual part numbering, color code and lead lengths for test lead assemblies. The E-Z HOOK Catalog contains the KILO-COLOR color combination selector wheel with over 1,000 colors to choose from. 48-hour shipment of all standard orders, and immediate responsiveness to any unique assembly requested. A complete PRICE LIST is included.

CALL OR WRITE FOR YOUR FREE COPY TODAY!

E-Z-HOOK®

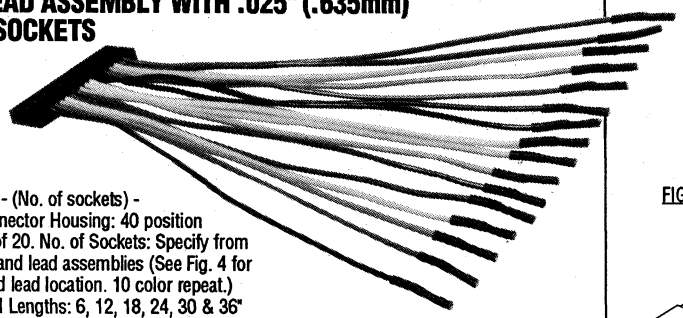
Specifications Subject to Change Without Notice © 1989, E-Z Hook

E-Z HOOK, A Division of Tektest, Inc., Arcadia, CA 91006. P.O. Box 450. (818) 446-6175 FAX (818) 446-0972.

E-Z-HOOK® MULTI-LEAD TEST SYSTEMS

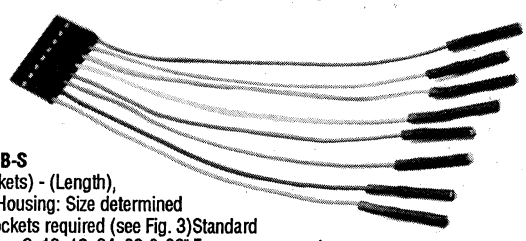
A choice of easy-to-use, quality multi-lead test systems are available to meet your specific requirements, providing single and dual-in-line interconnections. Leads with sockets and E-Z Hooks are available in 10-color repeat series. Immediate response to special assemblies is assured.

MULTI-LEAD ASSEMBLY WITH .025" (.635mm) SQUARE SOCKETS



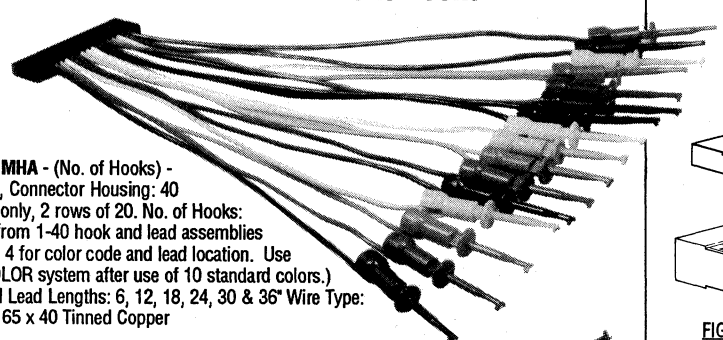
Part No. **MLA** - (No. of sockets) - (Length), Connector Housing: 40 position only, 2 rows of 20. No. of Sockets: Specify from 1-40 sockets and lead assemblies (See Fig. 4 for color code and lead location. 10 color repeat.)
Standard Lead Lengths: 6, 12, 18, 24, 30 & 36"
Wire type: 22 AWG 65 x 40 Tinned Copper

PCB CONNECTOR TO .025" (.635MM) SQUARE SOCKETS



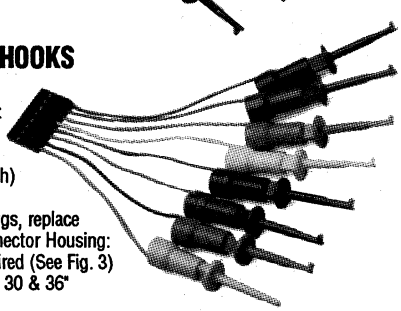
Part No. **PCB-S** (No. of Sockets) - (Length), Connector Housing: Size determined by no. of sockets required (see Fig. 3)Standard Lead Lengths: 6, 12, 18, 24, 30 & 36" For same connector with .025" square pins installed in housing (Fig. 2), specify Part No. **PLA-S** (No. of Sockets) - (Length).025" square sockets mate with E-Z Hook Model Nos. P-25, XM25, XK25 and XR25

MULTI-LEAD ASSEMBLY WITH XM MICRO-HOOKS



Part No. **MHA** - (No. of Hooks) - (Length), Connector Housing: 40 position only, 2 rows of 20. No. of Hooks: Specify from 1-40 hook and lead assemblies (See Fig. 4 for color code and lead location. Use KILO-COLOR system after use of 10 standard colors.)
Standard Lead Lengths: 6, 12, 18, 24, 30 & 36" Wire Type: 22 AWG 65 x 40 Tinned Copper

PCB CONNECTOR TO E-Z HOOKS



Part Nos. for housing with .025" square sockets installed (Fig. 1):
PCB - XK - (No. of Hooks) (Length)
PCB - XM - (No. of Hooks) (Length)
PCB - X100W - (No. of Hooks) (Length)
PCB - PICO - (No. of Hooks) (Length)
When specifying .025" Square Pin Plugs, replace PCB prefix with **PLA** (See Fig. 2) Connector Housing: Size determined by no. of hooks required (See Fig. 3)
Standard Lead Lengths: 6, 12, 18, 24, 30 & 36"

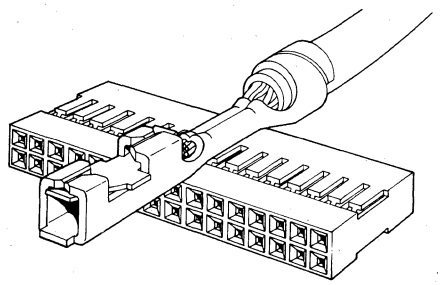


FIG. 1 INTERCONNECT DETAIL FOR PART NUMBERS WITH **PCB, MLA & MHA** PREFIXES

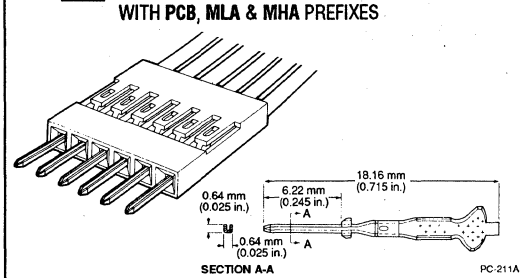


FIG. 2 MALE INTERCONNECT FOR **PLA** (Pin Lead Assembly) PART NUMBERS

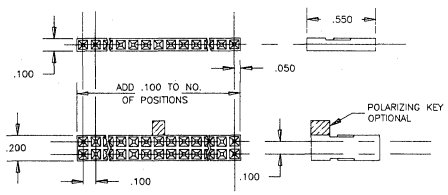


FIG. 3 HOUSING SIZES: WHEN ORDERING LEAD ASSEMBLY, SPECIFY NO. OF POSITIONS. IF SINGLE ROW, 2 THRU 36; DOUBLE ROW, 2 X 2 THRU 2 X 36 (Polarizing Key Available on Request)

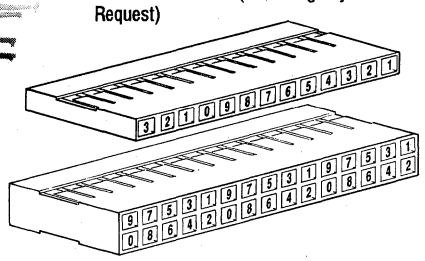


FIG. 4 REAR VIEW OF HOUSING COLOR CODE: 1 - Brown; 2 - Red; 3 - Orange; 4 - Yellow; 5 - Green; 6 - Blue; 7 - Violet; 8 - Gray; 9 - White; 0 - Black. Color code matches industry-standard RESISTOR COLOR CODE, also used to identify wire numbering position for standard E-Z Hook part numbers. Assemblies can be customized to meet special requirements.

Specifications Subject to Change Without Notice © 1989, E-Z Hook

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FISCHER CONNECTORS INCORPORATED

HIGH PERFORMANCE, AUTOMATIC LOCKING, CIRCULAR CONNECTORS

Fischer connector types include:

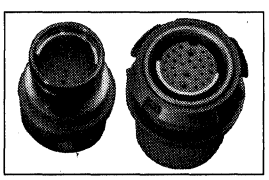
- **Coaxial**
- **Triaxial**
- **Mixed contacts**
- **Sterilizable**
- **Thermocouple**
- **Plastic series**
- **High temperature**
- **Twinaxial**
- **Multipole**
- **Sealed**
- **PCB contacts**
- **Crimp contacts**
- **High radiation**
- **High voltage**
- **Stainless steel contacts/shells**

Over **3000 combinations** of shell and contact configurations provide unparalleled design flexibility.

Modular construction allows a huge number of combinations without engineering or tooling charges.

Highly reliable electrical and **mechanical performance** is achieved through the use of precision machined bodies and gold-plated, machined contacts.

Our **unique automatic locking system** provides positive and reliable coupling, while eliminating any possibility of contact damage through use of a patented, metal semicircular polarization system.



Hermetically sealed connectors are a Fischer specialty. Standard features include:

- Vacuum tight to 10^{-8} Torr
- Immersion to 200 meters
- Pressure to 8 atmospheres
- Temperatures from -40°C to 200°C
- Radiation resistance to 10^9 rad
- Immunity to autoclaving, chemical, gas or gamma ray sterilization

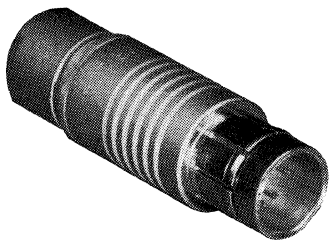
Other Fischer capabilities include:

- Ceramic inserts withstanding up to 400°C
- Voltage ratings to 55 KVDC
- Current ratings to 180 A
- Contact resistance <3 milliohms
- Special anti-corrosion finishes
- Semicustom and custom connectors

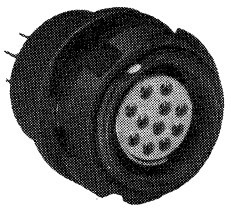
Fischer **pricing is extremely competitive** with manufacturers of similar type connectors.

Prompt delivery is a Fischer motto.

MEDICAL APPLICATION (HERMETICALLY SEALED)

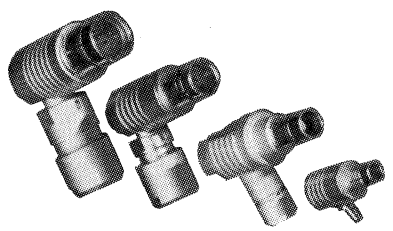


REAR PANEL MOUNT

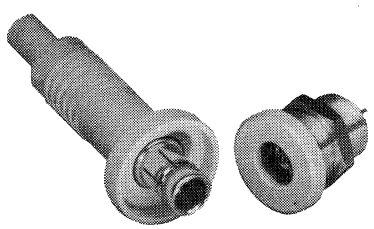


BLACK CHROME

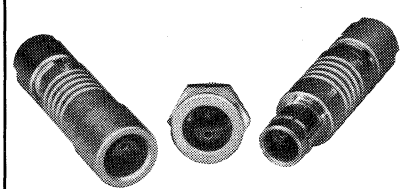
RIGHT ANGLE



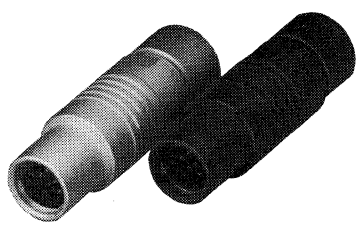
ESD SHOCK PROOF



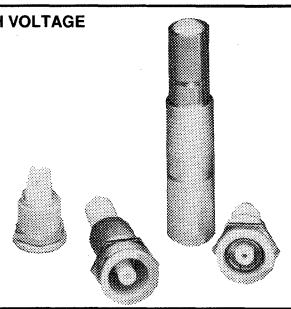
LEMO COMPATIBLE



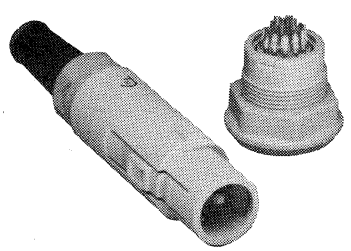
NON-LOCKING



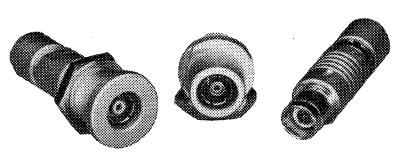
HIGH VOLTAGE



PLASTIC



TRIAX



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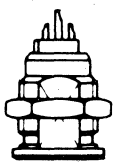
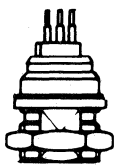
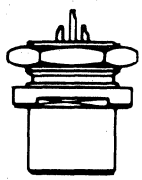


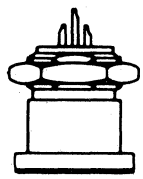
D–FRONT MOUNT



DBP–REAR MOUNT
DBPE–SEALED REAR MOUNT

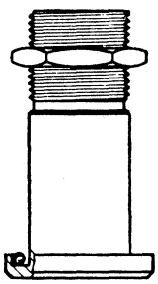


DBEE–SEALED

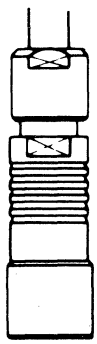


DEE–SEALED

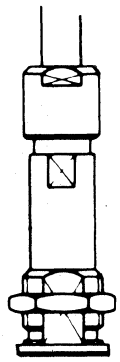
RECEPTACLES



WDE–SEALED FEED-THRU



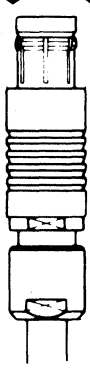
K–CABLE MOUNT
KE–SEALED CABLE MOUNT



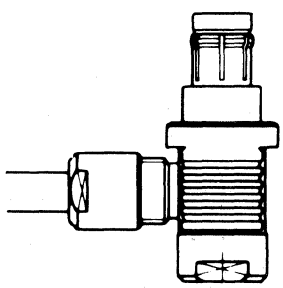
DK–CHASSIS MOUNT W/CABLE CLAMP
DKE–SEALED CHASSIS MOUNT W/CABLE CLAMP

ANY PLUG MATES WITH ANY RECEPTACLE

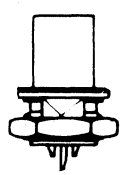
PLUGS



S–CABLE MOUNT
SE–SEALED CABLE MOUNT



WS–RIGHT ANGLE
WSE–SEALED RIGHT ANGLE



SF–PANEL PLUG
SFE–SEALED PANEL PLUG

Receptacles/ Plugs	Series 101		Series 102		Series 103		Series 104		Series 105		Series 106		Series 107		Series 400	
	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)	Max Length (mm)	Max Diam. (mm)
D	15.3	7.0	19.0	11.0	23.0	14.0	25.0	19.0	32.5	22.0	50.0	37.0	46.0	40.0	27.0	18.0
DBP	–	–	20.2	14.0	23.0	14.0	23.0	19.0	29.5	22.0	–	–	–	–	–	–
DBEE	–	–	19.5	14.0	23.0	18.0	30.0	22.0	32.5	27.0	50.0	40.0	47.0	45.0	–	–
DEE	–	–	20.0	14.0	23.0	18.0	25.0	22.0	32.5	27.0	50.0	41.0	47.0	45.0	–	–
WDE	–	–	39.0	14.0	40.0	17.0	40.0	22.0	62.0	27.0	74.0	42.0	92.0	45.0	–	–
K/KE	26.5	6.5	35.0	10.0	43.0	13.0	50.0	16.0	60.0	19.0	79.0	37.0	–	–	61.0	18.0
DK	26.5	7.0	35.0	11.0	43.0	14.0	50.0	19.0	60.0	22.0	80.0	32.0	105.0	40.0	–	–
DKE	–	–	35.0	14.0	43.0	18.0	50.0	22.0	60.0	27.0	85.0	37.0	110.0	45.0	–	–
S/SE	27.0	6.5	35.0	9.0	46.0	12.0	50.0	15.0	60.0	18.0	78.0	28.0	110.0	34.0	61.0	20.0
WS	20.0	9.0	28.0	9.0	33.0	12.0	35.5	15.0	52.0	18.0	–	–	85.0	34.0	–	–
WSE	–	–	35.0	13.0	41.0	17.0	47.0	20.0	54.0	24.0	–	–	–	–	–	–
SF	18.5	8.0	20.0	10.0	23.5	14.0	27.0	18.0	29.0	22.0	–	–	50.0	36.0	–	–
SFE	–	–	–	–	25.2	17.0	28.0	22.0	–	–	–	–	–	–	–	–

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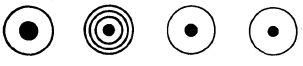
Series	Ref. No.	Description	Contacts	Test Voltage Contact to Body	Imped. (Ohms ± 2)	Max. I	Cable Diameter (mm)	Cable Type
101	S 101 A004	Coaxial, solder	1	3.0 KVDC	50	2A DC	1.5-3.0	The following cables may be used: **Cable Diameter 1.5 - 3.0 mm (0.59 - 0.118")** RG-174 A/U RG-174/U RG-178 B/U RG-187/U **Cable Diameter 5.1 mm (0.200")** RG-58 C/U RG-58 B/U RG-400
	S 101 A004-2	Coaxial, crimp	1	3.0 KVDC	50	2A DC	3.0	
	S 101 A004-3	Coaxial, crimp	1	3.0 KVDC	50	2A DC	5.1	
	S 101 A004-7	Coaxial, solder	1	3.0 KVDC	50	2A DC	5.1	
	WS 101 A004	Coaxial, crimp	1	3.0 KVDC	50	2A DC	3.0	
	SAW 101 A004	Termination, 50 Ohms	1	3.0 KVDC	50	2A DC		
	SM 101 A004	Shorting plug	1	3.0 KVDC	50	2A DC		
	SF 101 A004	Coaxial	1	3.0 KVDC	50	2A DC		
	SDL 101 A004	Right angle adaptor	1	3.0 KVDC	50	2A DC		
	SDT 101 A004	T adaptor	1	3.0 KVDC	50	2A DC		
	D 101 A004	Coaxial	1	3.0 KVDC	50	2A DC		
	D 101 A004-8	Coaxial, body gold plated	1	3.0 KVDC	50	2A DC		
	DK 101 A004	Coaxial, solder	1	3.0 KVDC	50	2A DC	1.5-3.0	
	DK 101 A004-2	Coaxial, crimp	1	3.0 KVDC	50	2A DC	1.5-3.0	
	DK 101 A004-3	Coaxial, crimp	1	3.0 KVDC	50	2A DC	5.1	
	K 101 A004	Coaxial, solder	1	3.0 KVDC	50	2A DC	1.5-3.0	
	K 101 A004-2	Coaxial, crimp	1	3.0 KVDC	50	2A DC	1.5-3.0	
	K 101 A004-3	Coaxial, crimp	1	3.0 KVDC	50	2A DC	5.1	
	K-K 101 A004	Adaptor female-female	1	3.0 KVDC	50	2A DC		
	WD 101 A004	Feed through, female-female	1	3.0 KVDC	50	2A DC		
	DLP 101 A004	PCB, right angle, gold plated body	1	3.0 KVDC	50	2A DC		
	DLP 101 A004-10	PCB, right angle, nickel plated body	1	3.0 KVDC	50	2A DC		
	DP 101 A004-9	PCB, mount in pairs, gold plated body	1	3.0 KVDC	50	2A DC		
	DP 101 A004-10	PCB, straight, nickel plated body	1	3.0 KVDC	50	2A DC		
	S 101 A004-Cinch	Female RCA-CAMAC male adaptor	1	3.0 KVDC	50	2A DC		
	IB3C-S 101 A004	BNC, female-CAMAC male adaptor	1	3.0 KVDC	50	2A DC		
	D 101 A004-Cinch	Male RCA-CAMAC female adaptor	1	3.0 KVDC	50	2A DC		
	D 101 A004-IB11	BNC, male-CAMAC female adaptor	1	3.0 KVDC	50	2A DC		
	IB3C-D 101 A004	BNC, female-CAMAC female adaptor	1	3.0 KVDC	50	2A DC		

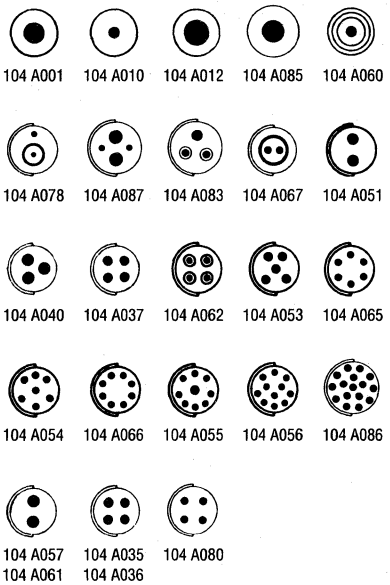
Series	Ref. No.	Description	Contacts	Test Voltage (kVAC @ 50 Hz) Contact to Body	Test Voltage (kVAC @ 50 Hz) Contact to Contact	Imped. (Ohms)	Max. I (Amps)	Contact Diameter mm/AWG	Cable O.D. (mm)
102 102 A001 102 A018 · 102 A002 102 A017 · 102 A019 · 102 A014 102 A021 · 102 A022 · 102 A051 · 102 A052 · 102 A053	102 A001	Single pole	1	1.4			6	1.6/14	unshielded: 1.4-4.5 shielded: 1.4-4.5 sealed: 1.5-4.3
	102 A018	Single pole	1	7.0 DC			2	0.9/22	
	102 A002	Coaxial	1	1.8		50	2	0.9/22	
	102 A017	Coaxial	1	1.5		75	4	1.3/18	
	102 A019	Coaxial	1	1.0			8	1.6/14	
	102 A014	Triaxial	2				2	0.9/22	
	102 A021	Triaxial	2	0.16/1.4	0.7	50	2	0.9/22	
	102 A022	Multipole	2	0.7	0.9		2	0.9/22	
	102 A051	Multipole	2	0.7	0.9		2	0.9/22	
	102 A052	Multipole	3	0.7	0.9		2	0.9/22	
	102 A053	Multipole	4	0.5	0.7		1	0.7/24	
103  103 A001 · 103 A002 103 A023 · 103 A026 · 103 A028 103 A015 · 103 A016 · 103 A011 103 A025 · 103 A030 · 103 A051 103 A052 · 103 A053 · 103 A054 · 103 A056 · 103 A057	103 A001	Single pole	1	2.6			8	2.0/12	unshielded: 2.5-6.5 shielded: 2.4-6.5 sealed: 1.5-6.0
	103 A002	Coaxial	1	3.2		75	4	1.3/18	
	103 A023	Coaxial	1	9.0 DC		50	4	1.3/18	
	103 A026	Coaxial	1	1.6		50	6	1.6/14	
	103 A028	Coaxial	1	9.0 DC			4	1.3/18	
	103 A015	Triaxial	2	1.1	1.0		4	1.3/18	
	103 A016	Triaxial	2	1.1	1		4	1.3/18	
	103 A011	Multipole	1 Fe.	0.7	1.3		4	1.3/18	
			1 Co.	0.7	1.3		4	1.3/18	
	103 A025	Multipole	1 Cr.	0.7	1.3		4	1.3/18	
			1 Al.	0.7	1.3		4	1.3/18	
	103 A030	Multipole	2	0.7	1.2			1.3/18	
	103 A051	Multipole	2	0.7	1.2		4	1.3/18	
	103 A052	Multipole	3	0.7	0.8		4	1.3/18	
	103 A053	Multipole	4	0.7	1.3		2	0.9/22	
	103 A054	Multipole	5	0.7	0.9		2	0.9/22	
	103 A056	Multipole	6	0.6	0.5		2	0.7/24	
	103 A057	Multipole	7	0.6	0.5		2	0.7/24	

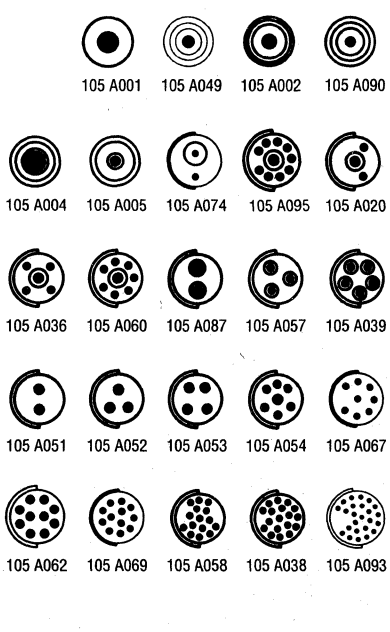
FISCHER CONNECTORS

HIGH PERFORMANCE, AUTOMATIC LOCKING, CIRCULAR CONNECTORS

FAX: 805-295-0090 ☎ (805) 295-0600 ■ (800) 344-0445 TOLL FREE (Except California)

Series	Ref. No.	Description	Contacts	Test Voltage (kVAC @ 50 Hz)		Imped. (Ohms)	Max. I (Amps)	Contact Diameter mm/AWG	Cable O.D. (mm)
				Contact to Body	Contact to Contact				
104	104 A001	Single pin	1	3.2			10	3.0/10	unshielded: 3.0-8.5 shielded: 2.8-8.5 sealed: 2.9-8.5
	104 A010	Single pin	1	8.0 DC			8	2.0/12	
	104 A012	Single pin	1	2.5			15	4.0/8	
	104 A085	Single pin	1	1.7			50	5.0/8	
	104 A060	Coaxial	1	4.0		50	8	2.0/12	
	104 A078	Single pin	1	1.0			2	0.9/22	
		Coaxial	2	1.0/3.8		50	2	0.7/24	
	104 A087	Low current	2	1.1	1.0		2	0.9/22	
		High current	2	1.0	1.0		25	2.3/12	
	104 A083	Mixed	1	1.2	2.7		6	1.6/14	
			2	2.5	2.5		2	0.9/22	
	104 A067	Multipole	2	0.7	0.9		2	0.9/22	
	104 A051	Multipole	2	1.3	1.8		6	1.6/14	
	104 A040	Multipole	3	1.25	1.3		6	1.6/14	
	104 A037	Multipole	4	1.3	1.4		4	1.3/18	
	104 A062	Multipole	4	6.0 DC	6.0 DC		2	0.9/22	
	104 A053	Multipole	5	0.9	1.2		4	1.3/18	
	104 A065	Multipole	6	1.2	1.5		2	0.9/22	
	104 A054	Multipole	7	0.9	1.1/1.8		2	0.9/22	
	104 A066	Multipole	8	0.9	1.1		2	0.9/22	
	104 A055	High current	1	2.9	1.5		4	1.3/18	
		Low current	8	0.6	0.8/1.0		2	0.9/22	
	104 A056	Multipole	11	0.6	0.8/10		2	0.9/22	
	104 A086	Multipole	16	0.5	0.8		1	0.7/24	
	104 A057	Multipole	1 Fe.	1.3	1.6		2	1.6/14	
			1 Co.	1.3	1.6		2	1.6/14	
	104 A061	Multipole	1 Cr.	1.6	1.6		2	1.3/18	
			1 Al.	1.6	1.6		2	1.3/18	
	104 A035	Multipole	2 Fe.	1	1.3		2	1.3/18	
			2 Co.	1	1.3		2	1.3/18	
	104 A036	Multipole	2 Cr.	1	1.3		2	1.3/18	
			2 Al.	1	1.3		2	1.3/18	
	104 A080	Multipole	4	1.3	1.1			1.3/18	
	104 A092	Multipole	19				1	0.7/24	
105	105 A001	Single pole	1	4.0			15	4.0/8	unshielded: 3.1-10.5 shielded: 3.1-10.5 sealed: 3.1-10.5
	105 A049	Single pole	1	25.0 DC			8	2.0/12	
	105 A002	Coaxial	1	5.0		50	10	3.0/10	
	105 A090	Coaxial	1	5.0		75	8	2.0/12	
	105 A004	Coaxial	1	13.0 DC		40	15	4.0/8	
	105 A005	Coaxial	1	14.0 DC		75	8	2.0/12	
	105 A074	Signal	1				4	1.3/18	
		Coaxial	2	8.0 DC	7.1/1.0	50	4	1.3/18	
	105 A095	Signal	9				2	0.9/22	
		Coaxial	2			50	4	1.3/18	
	105 A020	High voltage	1	14.0 DC			8	2.0/12	
		Low voltage	2	0.8	4.9		4	1.3/18	
	105 A036	High voltage	1	14.0 DC			8	2.0/12	
		Low voltage	4	0.8	3.5		4	1.3/18	
	105 A060	High voltage	1	14.0 DC	14.0 DC		8	2.0/12	
		Low voltage	7	0.9	1.0		4	1.3/18	
	105 A087	Multipole	2	1.1	1.5		35	3.0/10	
	105 A057	Multipole	3	5.5 DC	8.0 DC		4	1.3/18	
	105 A039	Multipole	5	7.0 DC	7.0 DC		4	1.3/18	
	105 A051	Multipole	2	2.0	1.8		2	2.0/12	
	105 A052	Multipole	3	1.3	1.6		8	2.0/12	
	105 A053	Multipole	4	0.8	1.3/2.0		8	2.0/12	
	105 A054	High current	1	2.4	1.3		8	2.0/12	
		Low current	6	1.1	0.9/2.7		4	1.3/18	
	105 A067	Multipole	8	0.95	1.0		4	1.3/18	
	105 A062	Multipole	10	0.9	0.9		4	1.3/18	
	105 A069	Multipole	12	0.7	0.8		4	1.3/18	
	105 A058	Multipole	15	0.7	1.0		2	0.9/22	
	105 A038	Multipole	18	0.7	1.0		2	0.9/22	
	105 A093	Multipole	24	0.7	0.7		1	0.7/24	

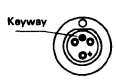




FISCHER CONNECTORS

HIGH PERFORMANCE, AUTOMATIC LOCKING, CIRCULAR CONNECTORS

FAX: 805-295-0090 ☎ (805) 295-0600 ■ (800) 344-0445 TOLL FREE (Except California)

Series	Ref. No.	Description	Contacts	Test Voltage (kVAC @ 50 Hz)		Imped. (Ohms)	Max. I (Amps)	Contact Diameter mm/AWG	Cable O.D. (mm)
				Contact to Body	Contact to Contact				
106	106 A003	Multipole	3	4	3		25	2.3/12	shielded: 4.2-19.2 sealed: 4.2-19.2
106 A003 106 A007 106 A019 106 A015	106 A007	Multipole	7	2.3	2.3		8	2.0/13	
	106 A019	Multipole	8	2.2	1.9		8	2.0/13	
	106 A015	Multipole	12	1.7	1.4		8	2.0/13	
	106 A018	Multipole	17	1.7	1.4		4	1.3/18	
	106 A017	Multipole	24	1.4	1.1		4	1.3/18	
	106 A013	Multipole	6	12 DC	12 DC		4	1.3/18	
	106 A014	Multipole	2	20 DC	13 DC		8	2.0/13	
		Multipole	6	2	1.6		4	1.3/18	
106 A018 106 A017 106 A013 106 A014 106 A010	106 A010	Multipole	6 Fe.	1.7	1.4		8	2.0/13	
		Multipole	6 Co.	1.7	1.4		8	2.0/13	
107	107 A003	Coaxial	1	30 DC		75	15	4.0/8	shielded: 6.2-22.7 sealed: 6.2-22.7
	107 A004	Coaxial	1	55 DC		75	15	4.0/8	
	107 A017	Coaxial	1	55 DC		50	15	5.0/6	
	107 A073	Coaxial	1	28 DC			180	10.0/0	
107 A003 107 A004 107 A017	107 A020	Multipole	2	8 DC	8 DC		25	2.3/12	
		Multipole	6	8 DC	8 DC		6	2.0/13	
	107 A034	Multipole	7	14 DC	14 DC		8	2.0/13	
	107 A076	Multipole	1	20 DC	21 DC		8	2.0/13	
			3	3.2 DC	2.8 DC		50	4.0/8	
			2	1.5 DC	3 DC		8	2.0/13	
107 A073 107 A020 107 A034 107 A076 107 A037			2	1.6 DC	2.8 DC		4	1.3/18	
	107 A037	Multipole	10	0.9 AC	0.9 AC	50	4	1.3/18	
			4			50	4	1.3/18	
			1	11 DC	7 DC	50	8	2.0/13	
107 A039 107 A024 107 A013 107 A018 107 A011	107 A039	Multipole	30	1.2 AC	1.3 AC		4	1.3/18	
			1			75		2.5/12	
	107 A024	Multipole	2	3.3 DC	7 DC		50	4.0/8	
	107 A013	Multipole	4	3.6 DC	5 DC		25	2.3/12	
	107 A018	Multipole	6	2.9 AC	2.9 AC		25	2.3/12	
	107 A011	Multipole	8	2.9 AC	2.9 AC		8	2.0/13	
	107 A015	Multipole	19	1.5 AC	1.5 AC		8	2.0/13	
	107 A051	Multipole	27	1.5 AC	1.6 AC		4	1.3/18	
	107 A052	Multipole	40	1.3 AC	1 AC		4	1.3/18	
	107 A062	Multipole	48	1.5 AC	1.1 AC		2	0.9/22	
	107 A023	Multipole	8	2 AC	1 AC		4	1.3/18	
107 A015 107 A051 107 A052 107 A062 107 A023			47	1 AC	1 AC		2	0.9/22	
400-Plastic	400 A002+E	Multipole	3	N.A.	3		10	1.8/14	unshielded: 2.0-8.5 shielded: 2.0-8.5
 400 A002+E 400 A004 400 A005	400 A004	Multipole	4	N.A.	2		4	0.8/22	
	400 A005	Multipole	5	N.A.	2		4	0.8/22	
	400 A006	Multipole	6	N.A.	2		4	0.8/22	
	400 A009	Multipole	9	N.A.	1.3		4	0.8/22	
	400 A012	Multipole	12	N.A.	1.0		4	0.8/22	
	400 A015	Multipole	15	N.A.	1.0		4	0.8/22	
400 A006 400 A009 400 A012 400 A015									

FISCHER CONNECTORS

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FISCHER CONNECTORS BY TYPE

The following is a partial list of some of the standard Fischer connectors. Please note if you don't see exactly what you need, call us. We have over 3000 different types of connectors from which to choose.

CERAMIC INSULATOR

(High temperature-400° C and high radiation resistance)

PART NO.	TYPE	FEATURE
102 A019	Coax	8A/1 KV
102 A022	2 pole	2A/0.7 KV
103 A016	Triax	
103 A028	Coax	9 KV
104 A046	Triax	
104 A080	4 pole	4A/1.1 KV
106 A012	12 pole	
107 A062	48 pole	

COAX/SINGLE CONTACT

PART NO.	TYPE	FEATURE
101 A001	40 Ohm	
101 A002	50 Ohm	
101 A004	50 Ohm	
102 A001	6 Amps	1.4 KV
102 A002	50 Ohm	
102 A017	75 Ohm	
102 A018		7 KV
102 A019	Ceramic	
102 A025	50 Ohm	17 KV, RG-58 crimp
102 A026	50 Ohm	3.5 KV
102 Z017	75 Ohm	
102 Z025	50 Ohm	17 KV, RG-58 crimp
102 Z026	50 Ohm	3.5 KV
103 A001	8 Amps	2.6 KV
103 A002	75 Ohm	
103 A009	75 Ohm	
103 A023	50 Ohm	5 KV
103 A026	50 Ohm	1.8 KV
103 A028		9 KV
103 A038	50 Ohm	RG-58
104 A002	75 Ohm	
104 A010		8 KV
104 A060	50 Ohm	
104 A078	1 coax,	+1 low voltage
104 A085	50 Amps	1.7 KV
105 A001	15 Amps	4 KV
105 A002	50 Ohm	
105 A004	40 Ohm	13 KV
105 A005	75 Ohm	14 KV
105 A049		25 KV
105 A090	75 Ohm	
105 A099		7.8 KV
107 A003	75 Ohm	30 KV
107 A004	75 Ohm	55 KV
107 A017	50 Ohm	55 KV

DELRIN COVERED BODY

PART NO.	TYPE
SE 1021 A004-10	4 pole
DEE 1021 A004-10	4 pole
SE 103 A055-4	6 pole
SFE 103 A055-4	6 pole
DEE 103 A055-4	6 pole
KE 103 A055-4	6 pole
SE 103 A056-15	6 pole
DEE 103.A056-15	6 pole
SE 1031 A012-10	12 pole
DEE 1031 A012-10	12 pole

HIGH VOLTAGE

PART NO.	TEST VOLTAGE	FEATURE
102 A018	7 KV	Coax
102 A025	17 KV	50 Ohm
102 A026	3.5 KV	50 Ohm
102 Z025	17 KV	50 Ohm
102 Z026	3.5 KV	50 Ohm
103 A023	5 KV	Coax, 50 Ohm
103 A028	9 KV	Coax
104 A010	8 KV	Coax
104 A062	6 KV	4 pole
104 A062-6	11 KV	4 pole
105 A004	13 KV	Coax, 40 Ohm
105 A005	14 KV	Coax, 75 Ohm
105 A020	14 KV	+2 low voltage
105 A036	14 KV	+4 low voltage
105 A039	7 KV	5 pole
105 A049	25 KV	Coax
105 A057	5.5 KV	3 pole
105 A060	14 KV	+7 low voltage
105 A074	8 KV	+1 low voltage
105 A089	4 KV	50 Ohm coax + 4 pole
105 A096	4.7 KV	+7 low voltage
105 A096-12	8.0 KV	+7 low voltage
105 A099	7.8 KV	Coax
1051 A015-1	8 KV	+11 low voltage
106 A013	12 KV	6 pole
106 A014	2–13 KV	+6 low voltage
106 A031	20 KV	2 pole
107 A003	30 KV	Coax, 75 Ohm
107 A004	55 KV	Coax, 75 Ohm
107 A017	55 KV	Coax, 50 Ohm
107 A034	14 KV	7 pole
107 A079	20 KV	5 pole
107-126	40 KV	Coax

LEMO COMPATIBLE

LEMO P/N	FISCHER P/N	TYPE
00.250	101 A004	NIM-CAMAC 50 Ohm coax
0.650	102 A021	50 Ohm triax
0.302	102 B051	2 pole
1.302	103 B051	2 pole

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MIXED CONTACTS

PART NO.	DESCRIPTION	
104 A055	1–4 Amp	8–2 Amp
104 A078	1–50 Ohm RG174	1–low voltage
104 A083	2–2.5 KV	1–1.2 KV
104 A087	2–25 Amp	2–2 Amp
105 A020	1–14 KV	2–0.8 KV
105 A036	1–14 KV	4–0.8 KV
105 A060	1–14 KV	7–0.9 KV
105 A074	1–50 Ohm RG58	1–low voltage
105 A089	1–50 Ohm RG58	4–low voltage
105 A095	1–50 Ohm RG174	9–low voltage
1051 A015-1	1–8 KV	11–low voltage
106 A014	2–13 KV	6–1.6 KV
107 A020	2–25 Amp	6–6 Amp
107 A023	8–8 Amp	47–2 Amp
107 A037	1–7 KV	4–50 Ohm 10–4 Amp
107 A039	1–75 Ohm RG59	30–4 Amp
107 A072	5–40 Amp	7–low voltage
107 A076	1–20 KV	3–50 Amp 2–8 Amp 2–4 Amp

PRINTED CIRCUIT BOARD MOUNT

Most Fischer connectors can be supplied in sealed or unsealed PCB mount versions.

REAR PANEL MOUNTING

Most Fischer receptacles can be suppled in sealed or unsealed rear panel mount style. Attractive dress nuts are standard.

REMOTE MANIPULATION (Robotic)

Fischer connectors can be supplied with special flat sided bodies, ideal for grasping by robotic arms.

SQUARE MOUNTING FLANGE

Square mounting flanges are available as an alternate mounting system for our most popular sizes.

STAINLESS STEEL BODY and/or PINS

Most Fischer connectors can be supplied with stainless steel bodies and contacts. For salt water/spray applications, we can supply special nickel plating on brass bodies as a lower cost option.

THERMOCOUPLE

PART NO.	NO. CONTACT	MATERIAL	TYPE
102 A005	2 pole	Chromel-alumel	K
102 A006	2 pole	Chromel-alumel	K
102 A007	2 pole	Gold plated brass	
102 A008	2 pole	Gold plated brass	
102 A009	2 pole	Iron-constantan	J
102 A016	2 pole	Copper-constantan	T
103 A011	2 pole	Iron-constantan	J
103 A025	2 pole	Chromel-alumel	K
103 A030	2 pole	Copper-constantan	T
104 A026	2 pole	Chromel-alumel	K
104 A035	4 pole	Iron-constantan	J
104 A036	4 pole	Chromel-alumel	K
104 A057	2 pole	Iron-constantan	J
104 A061	2 pole	Chromel-alumel	K
106 A010	12 pole	Iron-constantan	J
106 A011	12 pole	Chromel-alumel	K
107 A025	19 pole	Brass-constantan	

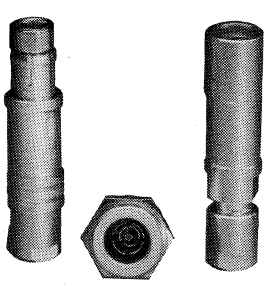
TRIAX

PART NO.	TYPE
101 A005	
102 A014	
102 A021	50 Ohm
103 A015	
104 A046	
104 Z088	
1051 A004	75 Ohm

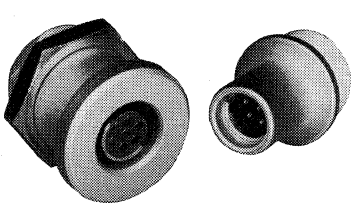
VIDEO TRIAX

A complete line of 75 Ohm triax connectors is manufactured by Fischer especially for video connections between a camera, its control unit and other equipment. For further information please ask for our Video Triax Catalog.

MINIATURE TRIAX



BLIND PANEL MATING



VIDEO TRIAX

FISCHER CONNECTORS

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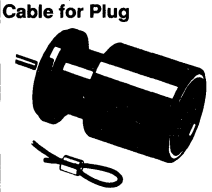
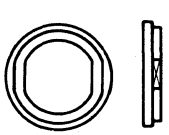
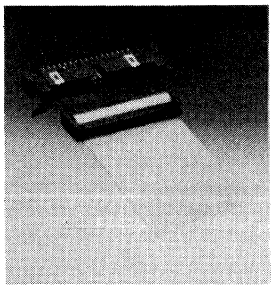
ACCESSORIES

Accessory	Body Style	Series 101	Series 102	Series 103	Series 104	Series 105	Series 106	Series 107	Series 400
Neoprene Boot	S/SE	—	102.00.785	103.00.685	104.00.861	105.00.1545	106.00.226	107.00.808	—
	K/KE	—	102.00.786	103.00.686	104.00.862	105.00.1546	106.00.405	107.00.809	—
Sealing Cap with Nylon Cable for Plug	S/SE	—	102.00.775	103.00.720	104.00.299	—	—	—	—
Sealing Cap with PVC Coated Stainless Steel Cable for Plug 	S/SE	—	—	—	104.00.885	105.00.1659	106.00.791	107.00.690	—
Sealing Cap with Nylon Cable for Receptacle	D DEE DBEE DBP DBPE DK DKE K/KE	—	102.00.776	103.00.721	104.00.399	—	—	—	—
Sealing Cap with PVC Coated Stainless Steel Cable for Plug	D DEE DBEE DBP DBPE DK DKE K/KE	—	—	—	—	105.00.1660	106.00.792	107.00.691	—
	Color								
Cable Bend Relief	White	101.00.846	—	E4 103.190.1	—	—	—	—	—
	Black	101.00.847	E4 102.190.2	E4 103.190.2	E4 104.190.2	400.00.260	—	—	400.00.260
	Green	—	E4 102.190.3	E4 103.190.3	E4 104.190.3	—	—	—	—
	Blue	101.00.842	—	E4 103.190.4	E4 103.190.4	400.00.258	—	—	400.00.258
	Yellow	101.00.849	—	E4 103.190.5	—	—	—	—	—
	Red	101.00.848	E4 102.190.6	E4 103.190.6	E4 104.190.6	—	—	—	—
	Grey	101.00.843	E4 102.190.7	E4 103.190.7	E4 104.190.7	—	—	—	—
Insulating Rings for Receptacles 	Brown	101.00.844							
	White	101.00.381	102.00.791	103.00.382	—	—	—	—	—
	Black	101.00.383	102.00.792	103.00.383	104.00.377	—	—	—	—
	Green	—	102.00.793	—	—	—	—	—	—
	Blue	—	102.00.794	—	—	—	—	—	—
	Yellow	—	102.00.795	—	—	—	—	—	—
	Red	101.00.382	102.00.796	—	—	—	—	—	—
	Grey	—	102.00.797	—	—	—	—	—	—

[redacted] FUJITSU [redacted]

CONNECTORS

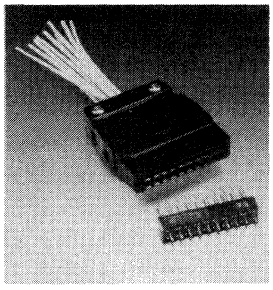
IDC SOCKETS & HEADERS
MODEL FCN-700, FCN-600



FEATURES:

The Model 700 connector has a superior ejector with a unique flexible hook. Header terminals are tin-plated and have superior cost performance; the solder dip section is made into a 0.5 mm (0.020 in.) square and can be used in a ∅0.8 mm (0.031 in.) through-hole. A special strain relief prevents wire breakage, and incorrect insertion is prevented by two kinds of keys and bump polarization. Connectors with 4 mm (0.157 in.) terminals have also been serialized for mounting on multi-layer PC boards. 10-64 positions. Stackable headers available.

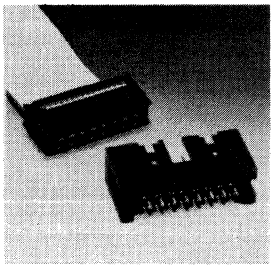
SOCKET HOUSINGS, CRIMP CONTACTS & HEADERS
MODEL FCN-720



FEATURES:

This crimp connector has been designed for wide use, and comes in many shapes and contact arrangements (one and two rows). The Model 720 block headers are matable with the Model 700 and 740 sockets, and Model 720 sockets are lockable with Model 700 headers when a special cover is used. Female contacts are secured in the housing by a unique internal spring structure. High-pressure contacts are also available which prevent accidental disconnection in applications using only a few contacts. For the W and S type headers, insulation molds can be broken into the necessary size. 0.100″ pitch (2.54mm) & .079″ pitch (2mm)

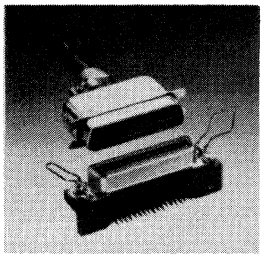
MINI IDC SOCKETS & HEADERS
MODEL FCN-740



FEATURES

This mini-header and socket were developed to provide a compact set of connectors—their combined height is less than half that of the Model 700 connector. Unique plastic retention clips prevent disconnection due to vibration. There are up to 34 contact header and socket combinations, and the socket can be mated with all contact numbers of the FCN-700 header with S hooks and locked. The mini-header has an integral polarization to ensure correct insertion.

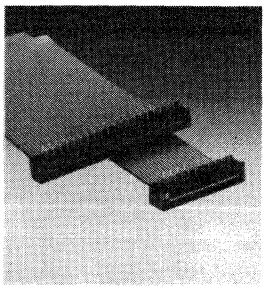
RIBBON CONTACT TYPE CONNECTORS
MODEL FCN-780/FCN-680



FEATURES

- The connectors are matable with other ribbon-type connectors, and have a sturdy metal shell that enables easy EMI shieldings.
- The connectors are made of PBT, a superior solvent-resistant material, enabling flux cleaning with chlorisin and other solvents.
- UL-recognized (94V-0) insulation material is used.
- 1.27 mm (0.050 in.) pitch flat cable can be used.
- Accessories available.
- Interface standards for SCSI, Centronics, HPIB, GPIP, IEEE 488.

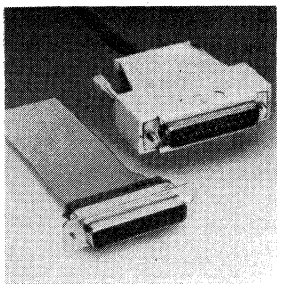
2 ROW IDC TRANSITION CONNECTORS
MODEL FCN-750



FEATURES

The Model 750 connector is slim—only 7 mm (0.275 in.) high and wide—and takes up very little space. The pins are in a 2.54 mm (0.100 in.) grid. It can be changed from a two-piece type connector to a direct solder dip connection without changing the PC board, because the mounting hole layout is the same as the Model 700 connector. And the series offers 10 to 60 contacts like the Model 700 connector.

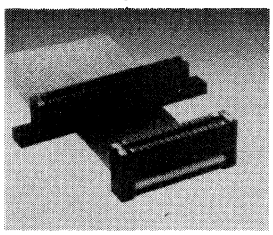
D-SUB CONNECTORS
MODEL FCN-770/FCN-670



FEATURES

- The 1.27 mm (0.050 in.) pitch flat cable can be used.
- The connectors are matable with MIL specifications D-type connectors.
- Fujitsu-developed highly reliable U-contracts are used.
- Molded and metalized (plated) holders are available.
- UL-recognized (94V-0) insulation material is used.
- RS232, 447, 449.

IDC CARD EDGE CONNECTORS
MODEL FCN-760, FCN-600



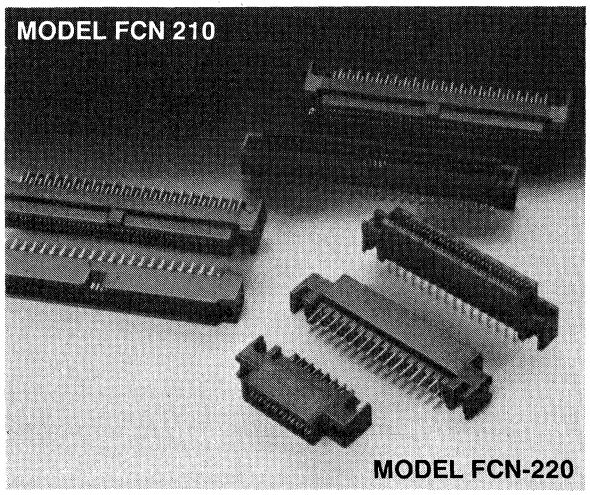
FEATURES

Model 760 connectors are card-edge connectors which meet conventional PC boards 1.6 mm (0.063 in.) thick with 2.54 mm (0.100 in.) pitch, and also connect to flat cables with 1.27 mm (0.05 in.) pitch. Contacts use highly reliable bifurcated contacts to assure stable connection with PC boards. A wide variety of contact numbers and three types of mounting ears are available for different needs. A closed-end cover is also available for convenience.

FUJITSU

CONNECTORS

BOARD TO BOARD & I/O CONNECTORS
CARD EDGE CONNECTORS



FEATURES

- 1.27 mm (0.05 in) pitch contact arrangement in two rows enables high-density mounting.
- They can be used for any type of connection between boards.
- The card-edge connectors can accommodate double-sided independent PC boards of 1.6 mm (0.063 in.) in thickness.
- Terminals are spaced in a four-row zigzag array (1.27 mm (0.05 in.) x 1.905 mm (0.075 in)) for easy PC board design.
- Insulation is UL-approved (94V-0), and is cleanable.

SPECIFICATIONS

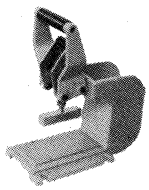
Temperature range	−55°C to +105°C
Current rating	2A DC
Voltage rating	250V AC
Contact resistance	35 mΩ max. (6V DC, 0.1A)
Insulation resistance	1,000 MΩ min. (500V AC)
Dielectric withstand voltage	500V AC for 1 minute
Insertion force	Two-piece connectors: 3 kg max. (10-way)
	Card-edge connectors: 2 kg max. (10-way)
Withdrawal force	Two-piece connectors: 250g min. (10-way)
	Card-edge connectors: 125 min. (10-way)
Applicable PC board	Two piece connectors: 1.6 mm (0.063 in.)
	Card-edge connectors: 1.6 mm (0.063 in.)
Applicable wire	Flat cable: 0.635 mm (0.025 in.) pitch AWG #30 (solid wire) AWG #32 (standard wire)

MATERIALS

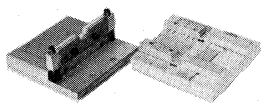
Contact	Phosphor bronze
Insulator	PBT, UL94V-0
Contact plating	Gold over Palladium over Nickel (PAGOS plating)

IDC TOOLS

Special tools are needed for FCN-210 Series connectors: a cable cutter, a locator plate for positioning connectors and cables, and a hand hand press to apply pressure. (See the figure below.)



HAND PRESS



CABLE CUTTER LOCATOR PLATE

NAME	PART NUMBER
Cable cutter	FCN-707T-T001/H
Hand press	FCN-707T-T101/H
Locator plate for socket	FCN-217T-T032/H
Locator plate for DIP connector	FCN-217T-T034/H

FEATURES

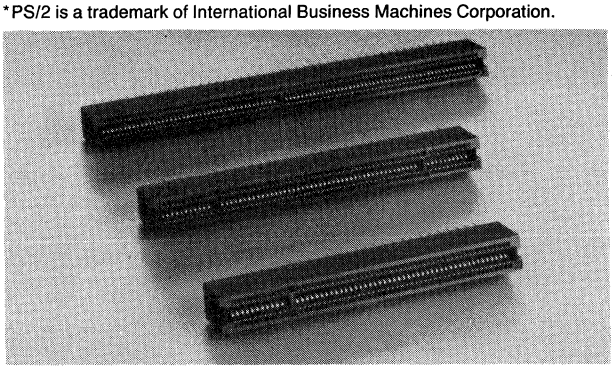
- All tools are easy to use, so even a beginner can install Fujitsu connectors.
- The number of pins can be changed easily only by setting the connector guide to a specified pin hole.
- The cable cutter remains sharp, providing fast, easy cuts for a long time.

NOTE:

- Instruction manual for each tool is attached with each.

FCN-220 SERIES (PS/2* TYPE)
Card Edge Connectors

*PS/2 is a trademark of International Business Machines Corporation.



FEATURES

- 1.27 mm (.050 in.) pitch contact card-edge connectors that accommodate double-sided PCB of 1.6 mm (0.63 in.) thickness.
- Terminal pitch of 2.54 mm x 2.54 mm. (.100 in. x .100 in.) for staggered-hole PCB.
- Pre-loaded contact structure for reliable contact with PCB.
- Perfect polarization type

MATERIAL

Item	Material
Contact	Copper alloy
Insulator	PET, UL94V-0
Contact plating	Gold over Palladium over Nickel (PAGOS plating)

Available in 112, 132 & 182 positions.

PART NUMBER

FCN-224J112-G/OS	FCN-224J132-G/OS	FCN-224J182-G/OS

[redacted] FUJITSU

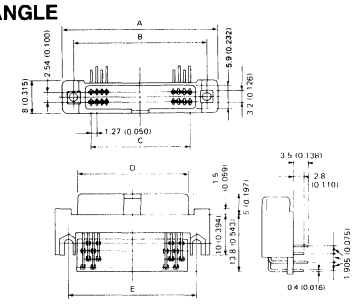
[redacted] CONNECTORS

MODEL FCN-210/220 CONTINUED

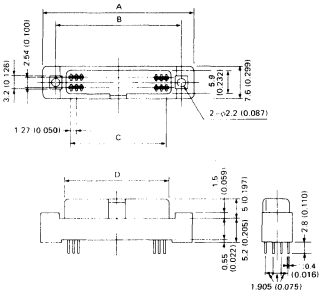
TWO-PIECE TYPE, SOCKET CONNECTORS/DIMENSIONS

Unit: mm (in.)

RIGHT ANGLE



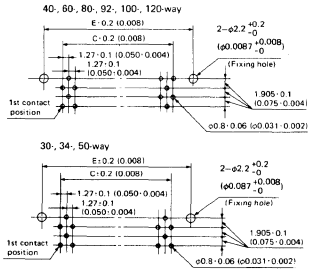
STRAIGHT



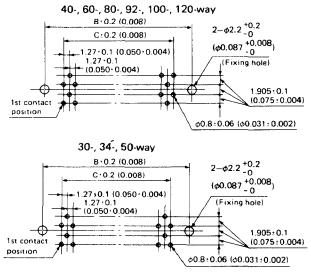
MOUNTING HOLE LAYOUT

Unit: mm (in.)

RIGHT-ANGLE



STRAIGHT

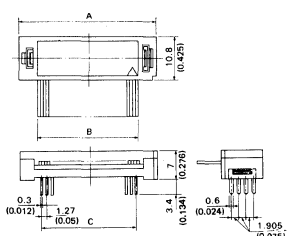


PART NUMBERS

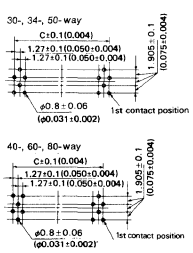
No. of contacts	Part Number		Dimensions				
	Right-angle	Straight	A	B	C	D	E
30	FCN-215J030-G/0	FCN-214J030-G/0	31.83 (1.253)	26.28 (1.035)	17.78 (0.700)	20.68 (0.814)	25.28 (0.995)
34	FCN-215J034-G/0	FCN-214J034-G/0	34.37 (1.353)	28.82 (1.135)	20.32 (0.800)	23.22 (0.914)	27.82 (1.095)
40	FCN-215J040-G/0	FCN-214J040-G/0	38.18 (1.503)	32.63 (1.285)	24.13 (0.950)	27.03 (1.064)	31.63 (1.245)
50	FCN-215J050-G/0	FCN-214J050-G/0	44.53 (1.753)	38.98 (1.535)	30.48 (1.200)	33.38 (1.314)	37.98 (1.495)
60	FCN-215J060-G/0	FCN-214J060-G/0	50.88 (2.003)	45.33 (1.785)	36.83 (1.450)	39.73 (1.564)	44.33 (1.745)
80	FCN-215J080-G/0	FCN-214J080-G/0	63.58 (2.503)	58.03 (2.285)	49.53 (1.950)	52.43 (2.064)	57.03 (2.245)
92	FCN-215J092-G/0	FCN-214J092-G/0	71.20 (2.803)	65.65 (2.585)	57.15 (2.250)	60.05 (2.364)	64.65 (2.545)
100	FCN-215J100-G/0	FCN-214J100-G/0	76.28 (3.003)	70.73 (2.785)	62.23 (2.450)	65.13 (2.564)	69.73 (2.745)
120	FCN-217J120-G/0	FCN-214J120-G/0	88.98 (3.503)	83.43 (3.285)	74.93 (2.950)	77.83 (3.064)	82.32 (3.245)

DIP CONNECTORS FOR 0.635 mm FLAT CABLE/DIMENSIONS

Unit: mm (in.)

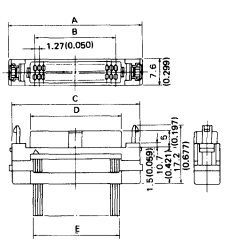


MOUNTING HOLE LAYOUT Unit: mm (in.)

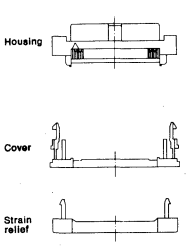


IDC SOCKET FOR 0.635 mm FLAT CABLE/DIMENSIONS

Unit: mm (in.)



IDC SOCKET



PART NUMBERS

No. of contacts	Part Number	Dimensions		
		A	B	C
30	FCN-214P030-G/0	28.35 (1.116)	19.05 (0.750)	17.78 (0.700)
34	FCN-214P034-G/0	30.89 (1.216)	21.59 (0.850)	20.32 (0.800)
40	FCN-214P040-G/0	34.70 (1.366)	25.40 (1.000)	24.13 (0.950)
50	FCN-214P050-G/0	41.05 (1.616)	31.75 (1.250)	30.48 (1.200)
60	FCN-214P060-G/0	47.40 (1.866)	38.10 (1.500)	36.83 (1.450)
80	FCN-214P080-G/0	60.10 (2.366)	50.80 (2.000)	49.53 (1.950)

PART NUMBERS

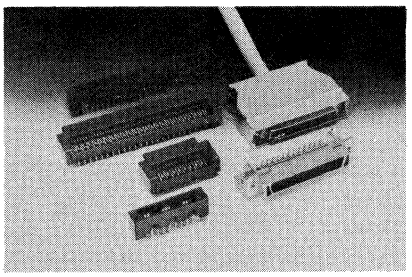
No. of contacts	Part Number	Dimensions				
		A	B	C	D	E
30	FCN-217J030-G/0	33.43 (1.316)	17.78 (0.700)	31.83 (1.253)	20.68 (0.814)	19.05 (0.750)
34	FCN-217J034-G/0	35.97 (1.416)	20.32 (0.800)	34.37 (1.353)	23.22 (0.914)	21.59 (0.850)
40	FCN-217J040-G/0	39.78 (1.566)	23.13 (0.950)	38.18 (1.503)	27.03 (1.064)	25.40 (1.000)
50	FCN-217J050-G/0	46.13 (1.816)	30.48 (1.200)	44.53 (1.753)	33.38 (1.314)	31.75 (1.250)
60	FCN-217J060-G/0	52.48 (2.066)	36.83 (1.450)	50.88 (2.003)	39.73 (1.564)	38.10 (1.500)
80	FCN-217J080-G/0	65.18 (2.566)	49.53 (1.950)	63.58 (2.503)	52.43 (2.064)	50.80 (2.000)

FUJITSU

CONNECTORS

BOARD TO BOARD & I/O CONNECTORS

MODEL FCN-230



SCSI 2 STANDARD AND OPPOSITE GENDER AVAILABLE

FEATURES

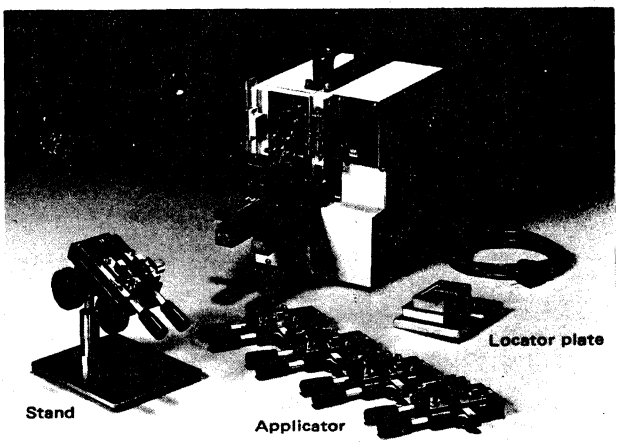
- Keyed backshells are available
- 1.27 mm (0.05 in.) pitch contact arrangement in two rows enables high density mounting
- Terminals are spaced in a four-row zigzag array (1.27 mm (0.05 in.) x 1.905 mm (0.075 in.)) for easy PC board design.
- IDC or Solder termination for discrete wiring available.
- Metal cover enables EMI protection.
- Insulation materials recognized by UL (94V 0)
- Each of the contacts on the female connector of mold type are alternately inset to facilitate two-step coupling, significantly reducing insertion force.

MATERIALS

Material	Copper alloy
Insulator	Polyester, UL94V-0
Plating	Gold over Palladium over Nickel (PAGOS)

SPECIFICATIONS

Temperature range	−55°C to +105°C					
Maximum rated current	1A DC (PCB to cable) 2A DC (PCB to PCB)					
Maximum rated voltage	240V AC					
Contact resistance	30 mΩ max. (6V DC, 0.1A)					
Insulation resistance	1000MΩ min. (500V DC)					
Dielectric withstand voltage	750V AC for 1 minute					
Insertion force (kg)	PC8 to PC8					
	No. of contacts	34	48	68	96	
	Force	3.0	4.0	5.5	7.0	
	PC8 to cable					
	No. of contacts	20	28	36	50	68
	Force	5.5	6.0	6.5	8.0	9.0
Withdrawal force (kg)	PCB to PCB					
	No. of contacts	34	48	68	96	
	Force	0.68	0.96	1.36	1.92	
	PCB to cable					
	No. of contacts	20	28	36	50	68
	Force	0.8	1.12	1.44	2.0	2.3
Applicable PC board	0.8 to 1.5 mm (0.031 to 0.53 in.) thick					
Applicable wire	IDC type AWG =28 or =30 (wire diameter: Ω0.5 to Ω0.65 (Ω0.020 to Ω0.024)) Solder type AWG =26 max.					



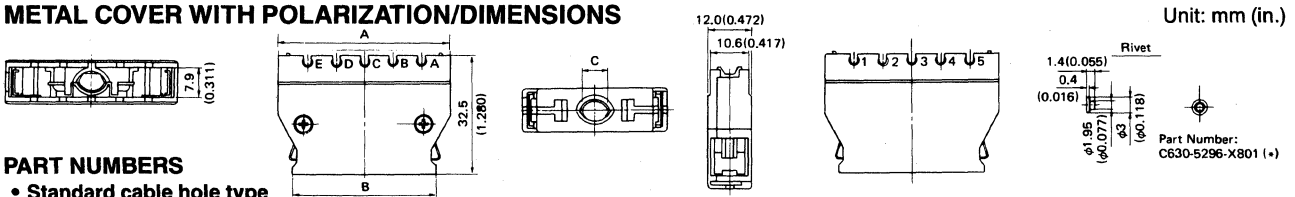
CABLE ALIGNER

Set	Main body	No. of contact	Applicator	Head	Stand
FCN-M550-1/A (mainbody/ applicator/ head/stand)	FCN-M551	20	FCN-A550-1/A-020	FCN-H550-1/A	FCN-D550
		28	FCN-A550-1/A-028		
		36	FCN-A550-1/A-036		
		50	FCN-A550-1/A-050		
		68	FCN-A550-1/A-068		

Hand tools also available.

METAL COVER WITH POLARIZATION/DIMENSIONS

Unit: mm (in.)



PART NUMBERS

• Standard cable hole type

No. of contacts*	Part Number	Dimensions A	B	C
20	FCN-230C020-B/E	28.95 (1.140)	21.15 (0.833)	4.5×5.5 (0.177×0.217)
28	FCN-230C028-B/E	34.03 (1.340)	26.23 (1.033)	5×7 (0.197×0.276)
36	FCN-230C036-B/E	39.11 (1.540)	31.31 (1.233)	6×8 (0.236×0.315)
50	FCN-230C050-B/E	48.00 (1.890)	40.20 (1.583)	6×8 (0.236×0.315)
68	FCN-230C068-B/E	59.43 (2.340)	51.63 (2.033)	6×8 (0.236×0.315)
• Wide cable hole type				
20	FCN-230C020-D/E	28.95 (1.140)	21.15 (0.833)	—
28	FCN-230C028-D/E	34.03 (1.340)	26.23 (1.033)	—
36	FCN-230C036-D/E	39.11 (1.540)	31.31 (1.233)	9×10 (0.354×0.394)
50	FCN-230C050-D/E	48.00 (1.890)	40.20 (1.583)	9×10 (0.354×0.394)
68	FCN-230C068-D/E	59.43 (2.340)	51.63 (2.033)	9×10 (0.354×0.394)

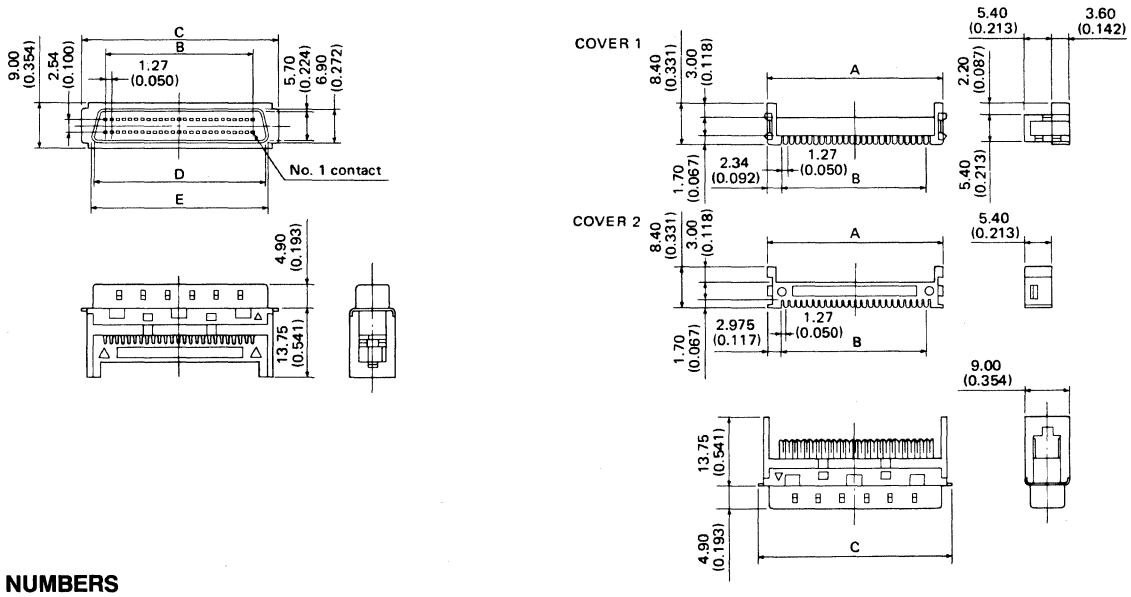
FUJITSU

CONNECTORS

FCN-230

DIMENSIONS FOR METAL SHIELDED SHELL TYPE IDC PLUG (SCSI II type)

Unit: mm (in.)



PART NUMBERS

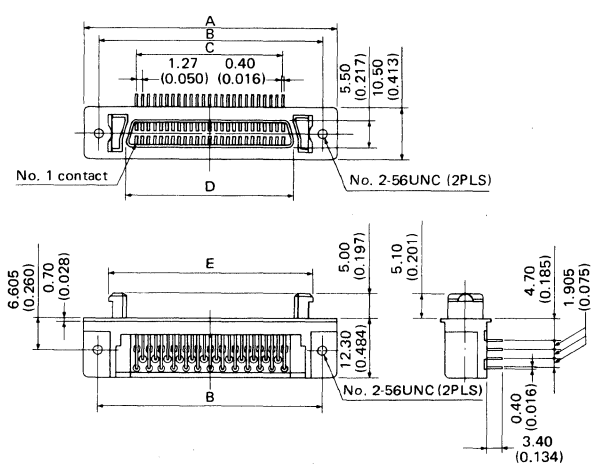
No. of contacts	Part Number	Dimensions				
		A	B	C	D	E
50	FCN-237R050-G/F	35.80 (1.409)	30.48 (1.200)	40.30 (1.587)	34.85 (1.372)	36.05 (1.419)
68	FCN-237R068-G/F	47.23 (1.859)	41.91 (1.650)	51.73 (2.037)	46.28 (1.822)	47.48 (1.869)

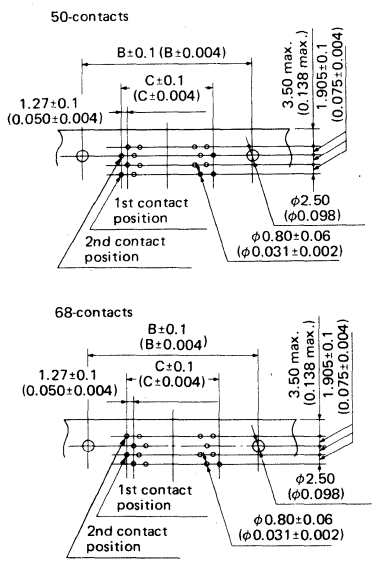
MOUNTING HOLE LAYOUT

Unit: mm (in.)

DIMENSIONS FOR METAL SHIELDED TYPE SOCKET (SCSII TYPE)

RIGHT ANGLE





(From mounting side of PCB)

PART NUMBERS

No. of contacts	Part Number	Dimensions				
		A	B	C	D	E
50	FCN-235D050-G/E	52.45 (2.065)	46.48 (1.830)	30.48 (1.200)	34.65 (1.364)	42.29 (1.665)
68	FCN-235D068-G/E	63.88 (2.515)	57.91 (2.280)	41.73 (1.650)	46.08 (1.814)	53.72 (2.115)

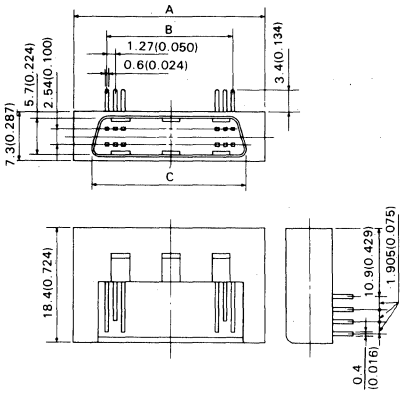
FUJITSU

CONNECTORS

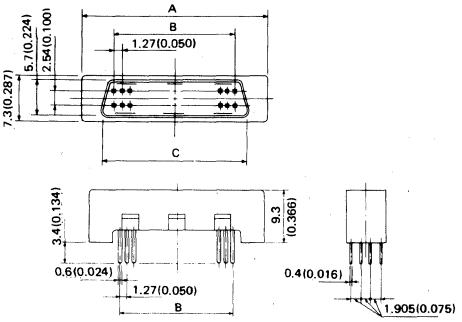
MODEL FCN-230 CONTINUED

UNSHIELDED TYPE PLUG CONNECTOR/DIMENSIONS Unit: mm (in.)

RIGHT ANGLE



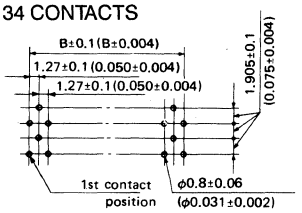
STRAIGHT



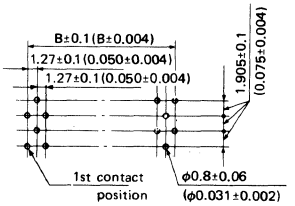
MOUNTING HOLE LAYOUT

Unit: mm (in.)

RIGHT ANGLE, STRAIGHT
34 CONTACTS



48, 68, AND 96 CONTACTS



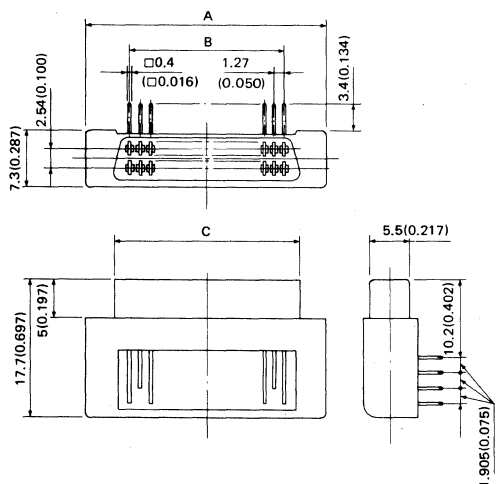
PART NUMBERS

No. of contacts	Part Number		Dimensions		
	Right angle	Straight	A	B	C
34	FCN-235P034-G/0	FCN-234P034-G/0	31.63 (1.245)	20.32 (0.800)	24.69 (0.972)
48	FCN-235P048-G/0	FCN-234P048-G/0	40.52 (1.595)	29.21 (1.150)	33.58 (1.322)
68	FCN-235P068-G/0	FCN-234P068-G/0	53.22 (2.095)	41.91 (1.650)	46.28 (1.822)
96	FCN-235P096-G/0	FCN-234P096-G/0	71.00 (2.795)	59.69 (2.350)	64.06 (2.522)

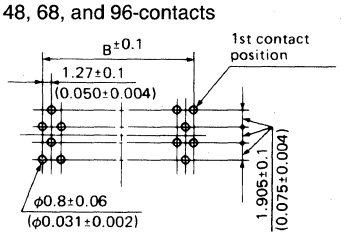
UNSHIELDED TYPE PLUG CONNECTOR/DIMENSIONS

Unit: mm (in.)

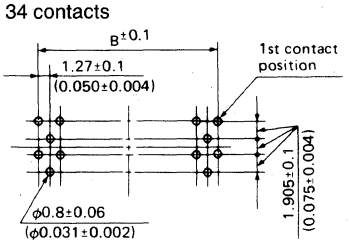
RIGHT ANGLE



STRAIGHT
48, 68, and 96-contacts



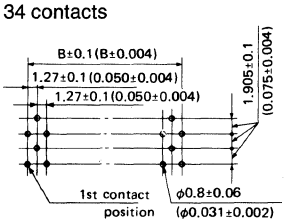
34 contacts



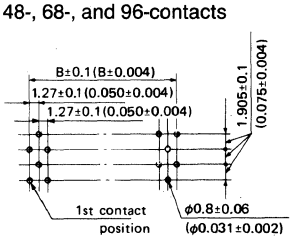
MOUNTING HOLE LAYOUT

Unit: mm (in.)

RIGHT ANGLE, STRAIGHT
34 contacts



48-, 68-, and 96-contacts



PART NUMBERS

No. of contacts	Part Number		Dimensions		
	Right angle	Straight	A	B	C
34	FCN-235J034-G/0	FCN-234J034-G/0	31.63 (1.245)	20.32 (0.800)	24.49 (0.964)
48	FCN-235J048-G/0	FCN-234J048-G/0	40.52 (1.595)	29.21 (1.150)	33.38 (1.314)
68	FCN-235J068-G/0	FCN-234J068-G/0	53.22 (2.095)	41.91 (1.650)	46.08 (1.814)
96	FCN-235J096-G/0	FCN-234J096-G/0	71.00 (2.795)	59.69 (2.350)	63.86 (2.514)

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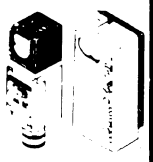
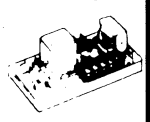
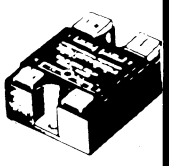
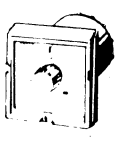

PHOTOELECTRICS

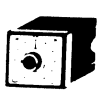
RELAYS


LIQUID LEVEL CONTROLS


SOLID STATE RELAYS

TERMINAL BLOCKS


TEMPERATURE CONTROLS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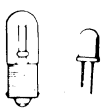
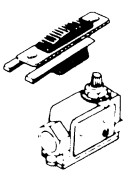

LAMPS & LEDS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WHERE TO FIND THEM IN THE 88/89 EDITION OF EEM

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AC Power Supplies, Product Selection Guide ..... **D**•2156
ASCII Code ..... **D**•1080
Batteries, Product Selection Guide ..... **D**•1447
Batteries & Fuel Cells, Characteristics ..... **D**•1450
Cabinets, Enclosures, Racks & Chassis, Product Selection Guide ..... **C**•1003
Capacitors, Basic Formulas ..... **A**•1093
Capacitors, Miniglossary ..... **A**•1066
Capacitors, Product Selection Guide ..... **A**•1002
Coils, Chokes, Inductors, Product Selection Guide ..... **A**•1197
Conductors, Maximum Current Capacity of Copper & Aluminum ..... **A**•2272, **C**•1316
Connectors, Miniglossary ..... **C**•1271
Connectors, Terminals & Sockets, Product Selection Guide ..... **C**•1127
Crystals, Oscillators, Crystal & Piezoelectric Filters, Product Selection Guide ..... **A**•1339
DC Power Supplies, Product Selection Guide ..... **D**•1537
Delay Lines, Product Selection Guide ..... **A**•1503
Dielectrics, Thermal Conductivity ..... **B**•1916
Discrete Semiconductors, Product Selection Guide ..... **A**•2154
Displays, Readouts, & CRTs, Product Selection Guide ..... **B**•1041
EBCDIC Code ..... **D**•1086
Encapsulation, Miniglossary ..... **C**•1124
Fans, Blowers, Cooling Equipment, & Heat Exchangers, Product Selection Guide ..... **C**•1631
Fiber Optics, Miniglossary ..... **B**•1185
Fiber Optics, Product Selection Guide ..... B•1204
Filters, Power, Product Selection Guide ..... **A**•1642
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Logofinder & Trademark Directories ..... **C**•901
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Military Qualified Products List ..... **B**•1002
Motors, Drives, & Rotating Components, Product Selection Guide ..... **B**•1221
Opto Semiconductors, Miniglossary ..... **A**•2169
Oscilloscopes, Product Selection Guide ..... **D**•1426
Panel Hardware, Product Selection Guide ..... **C**•1583
Panel Meters, Analog & Digital, Product Selection Guide ..... **D**•1376
Potentiometers, Trimmers, Controls, & Rheostats, Product Selection Guide ..... **A**•2078
Power Supplies, Miniglossary ..... A•2276, **D**•1541
Power Supplies, AC, Product Selection Guide ..... **D**•2156
Power Supplies, DC, Product Selection Guide ..... **D**•1537
Protective Components (Fuses, Circuit Breakers, etc.), Product Selection Guide ..... **B**•1351
Relay Contact Forms ..... **B**•1450
Relays, Electromechanical, Miniglossary ..... **B**•1414
Relays, Product Selection Guide ..... **B**•1411
Resistor Color Codes ..... **A**•1952
Resistors, Product Selection Guide ..... **A**•1867
Servo Components, Miniglossary ..... **B**•1266
SI Units, Basic Guide To, ... **A**•1434, **B**•1472, **C**•1692, **D**•1386
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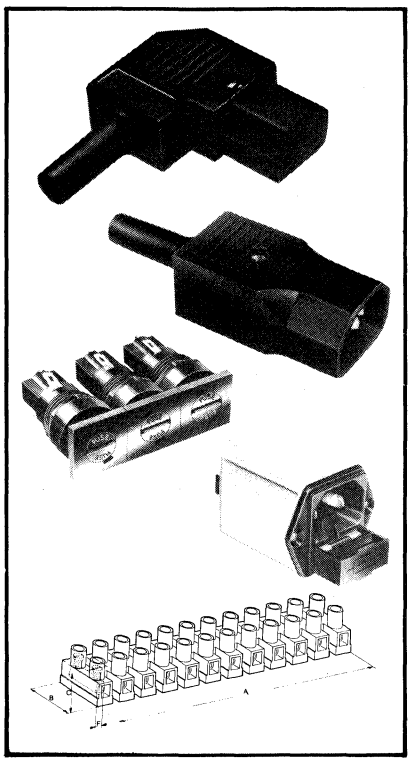
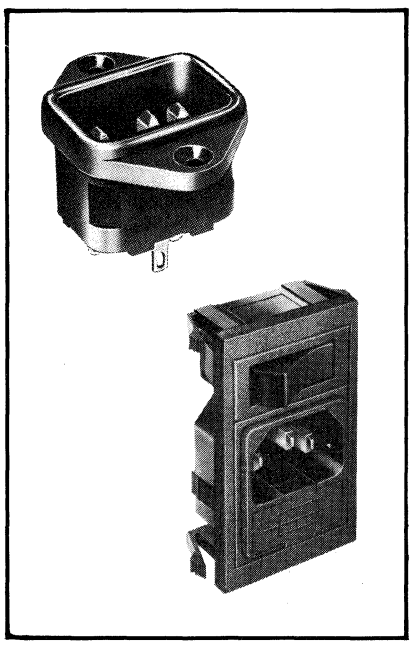
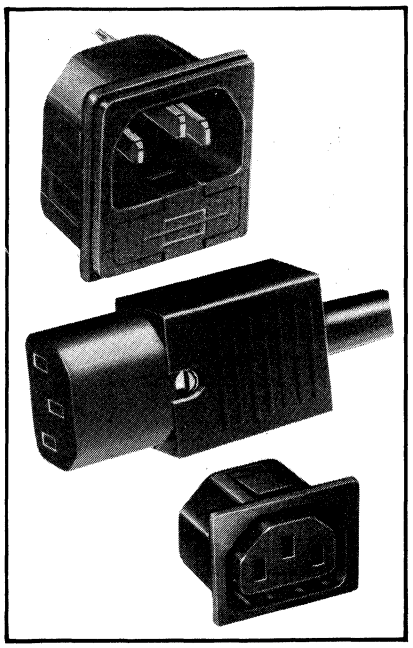
CONNECTORS, TERMINALS, SOCKETS



- PLUGS
- RECEPTACLES
- CONNECTORS
- CORDSETS
- SOCKETS
- POWER INLETS
- ROCKER SWITCHES
- VOLTAGE SELECTORS





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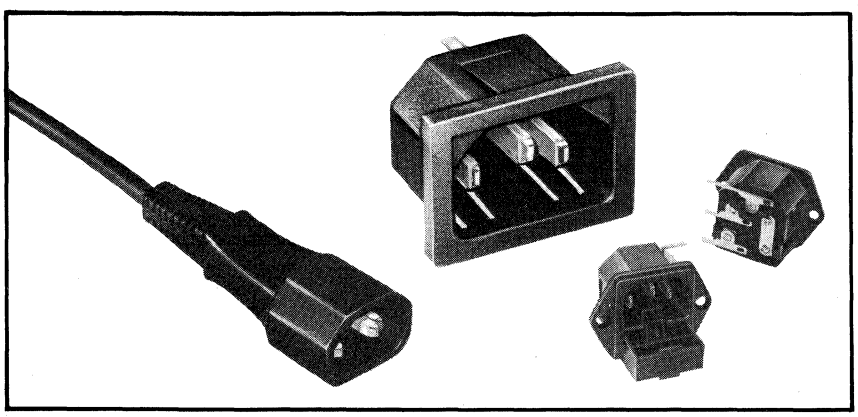

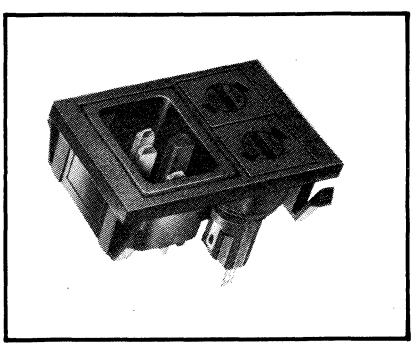

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COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

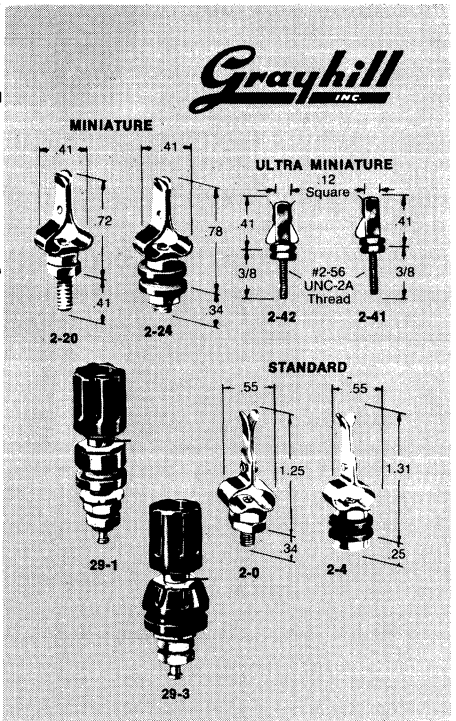
W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

Clips, Posts, Sockets

Termination Hardware

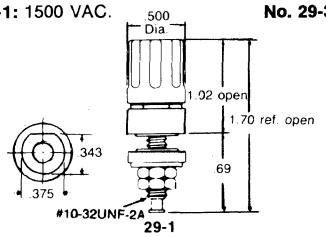


Test Clips

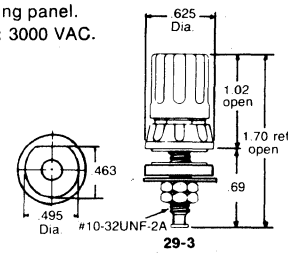
Designed for panel mounting on test equipment or for breadboarding to allow rapid connections without manual opening and closing of jaws. Hex nut under clip allows for tension adjustment of individual clip. Applicable to part numbers 2-0, 2-4, 2-20, 2-24, 2-41, and 2-42.

Binding Posts

Rating at 120 VDC: 15 amps continuously with a max. temperature rise of 20°C.
Insulation Resistance: Between stud and mounting panel.
No. 29-1: 120,000 megohms. **No. 29-3:** 200,000 megohms.
Voltage Breakdown: Between studs and mounting panel.
No. 29-1: 1500 VAC. **No. 29-3:** 3000 VAC.



29-1 Standard Screw Type Binding Post with Straight Skirt. Fits ⅜" Diameter Mounting Hole Allowing Close Spacing.

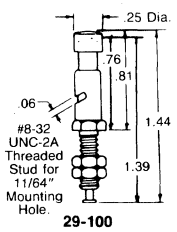


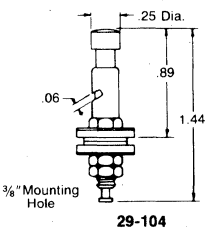
29-3 Standard Screw Type Binding Post with Flared Skirt Fits ½" Diameter Mounting Hole Allowing Wider Spacing.

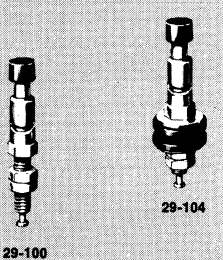
Push Post™

New plunger type binding post for positive connections. To operate, button is depressed, lead is placed in slot, and button is released. Spring pressure assures firm positive contact. Extends only ⅞" above mounting board.

Rating at 120 VDC: 20 amps continuously with a max. temperature rise of 20°C.

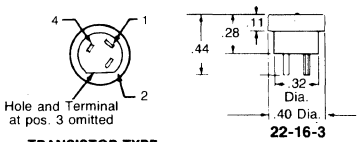






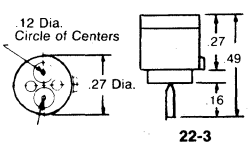
Sockets

Also available in 4 terminal, different pin to flat orientation and 4 pin, screw or rivet mount. See GRAYHILL Hardware catalog.



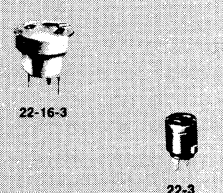
TRANSISTOR TYPE

Designed to accept the standard outline (TO-5, 9, 11, 16, 26, 29, 31 & 39). Leads fit on standard 100 mil grid for PC mount or fit a "D" hole to be held by a ring fastener. Wrap around terminals and molded-in indicator line for can tab orientation.



BI-PIN LAMP

Accepts standard T-1¼ and T-1¾ outline lamps when leads are trimmed to 0.215". PC mount terminals fit .032" diameter hole.



Ordering Information

For Binding Posts, use the complete numbers as shown in the charts below. Complete numbers for Test Clips and Sockets are shown above.

Binding Posts

Part Number	Button Cap Color
29-1 RED	Red
29-1 BLK	Black
29-3 RED	Red
29-3 BLK	Black

Push Post

Part Number	Button Cap Color
29-100 RED	Red
29-100 BLK	Black
29-104 RED	Red
29-104 BLK	Black

For prices and discounts, contact a local Sales Office, an authorized distributor, or GRAYHILL.

Available From Your Local GRAYHILL Distributor

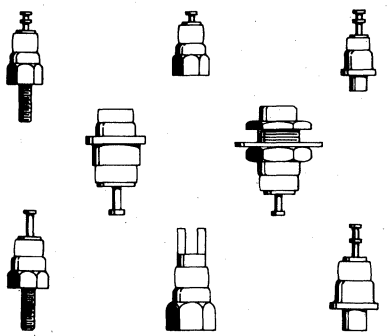
561 HILLGROVE • P.O. BOX 10373 • LA GRANGE, ILLINOIS 60525 • PHONE; (708) 354-1055

Available Locally Through Your Grayhill Distributor

manufacture and design of circuit components

HIRAM JONES
11607 VANOWEN STREET, NORTH HOLLYWOOD, CALIF. 91605
(213) 875-0213

Teflon† Insulated * One-Piece * Terminals and Test Jacks



*** DELIVERY** **Immediate — from stock on catalog items.**

*** QUALITY** **QPL facility, insuring highest product reliability. Complete traceability on all raw material and processes.**

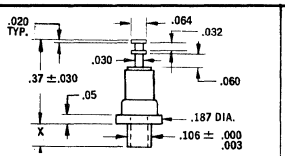
*** PRODUCTION** **Precision Swiss automatic machines — long or short runs to customer design and specifications.**

† Reg. Trademark, E. I. DuPont de Nemours and Co.

*** ONE-PIECE ***

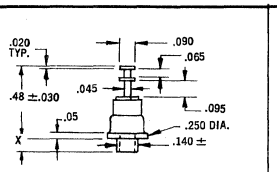
Teflon† Insulated Terminals

Male-Female Threads and Swage Types and Test Jacks



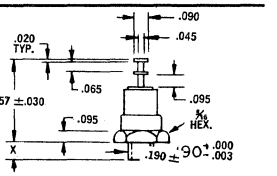
Single Turret also available O/A Height above Board: .30 ±.030 P/N TS-111-A/-4

Part No.	X	Board Thickness
TS-112-A	.055	1/64
TS-112-0	.075	1/32
TS-112-1	.095	.050
TS-112-2	.105	1/16
TS-112-3	.135	3/32
TS-112-4	.165	1/8



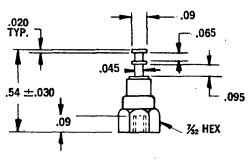
Single Turret also available O/A Height above Board: .39 ±.030 P/N TS-231-0/-4

Part No.	X	Board Thickness
TS-232-0	.075	1.32
TS-232-1	.095	.050
TS-232-2	.105	1/16
TS-232-3	.135	3/32
TS-232-4	.175	1/8



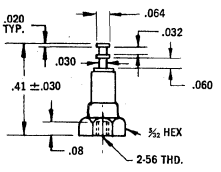
Single Turret also available O/A Height above Board: .50 ±.030 PN TS 351-1/-4

Part No.	X	Board Thickness
TS-352-1	.095	.050
TS-352-2	.105	1/16
TS-352-3	.135	3/32
TS-352-4	.165	1/8



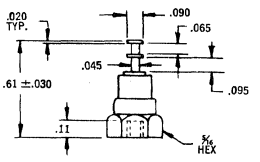
Part No.	Thread
TS-232-8F	4-40
TS-232-9F	6-32

Single Turret also available O/A Length: .47 ±.030 P/N TS-231-8F/-9F



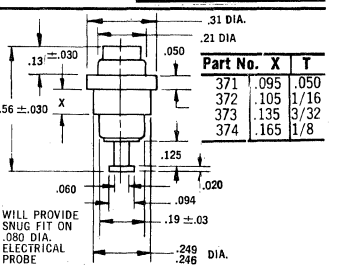
Part No.	Thread
TS-112-6F	2-56

Single Turret also available O/A Length: .35 ±.030 P/N TS-111-6F



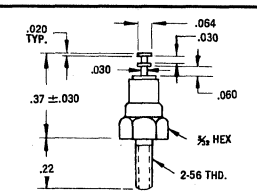
Part No.	Thread
TS-352-8F	4-40
TS-352-9F	6-32

Single Turret also available O/A Length: .54 ±.030 P/N TS-351-8F/-9F



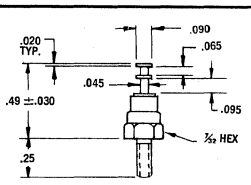
Part No.	X	T
371	.095	.050
372	.105	1/16
373	.135	3/32
374	.165	1/8

SWAGE TEST JACK
Available in 10 Standard E.I.A. colors



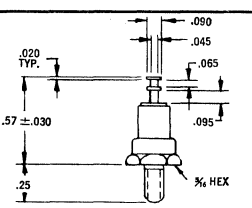
Part No.	Thread
TS-112-6M	2-56

Single Turret also available O/A Height above Board: .34 ±.030 P/N TS-111-6M



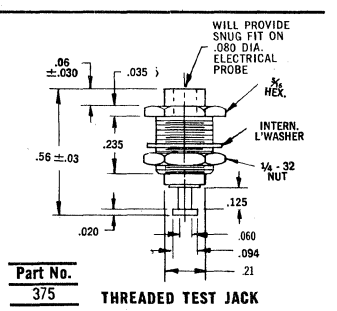
Part No.	Thread
TS-232-8M	4-40
TS-232-9M	6-32

Single Turret also available O/A Height above Board: .42 ±.030 P/N TS-231-8M/-9M



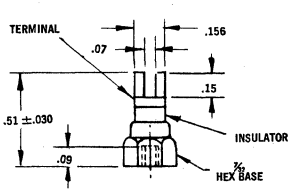
Part No.	Thread
TS-352-8M	4-40
TS-352-9M	6-32

Single Turret also available O/A Height above Board: .50 ±.030 P/N TS-351-8M/9M

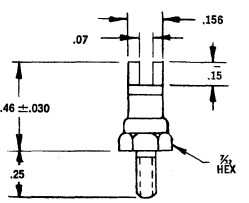


Part No.
375

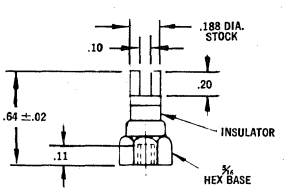
THREADED TEST JACK



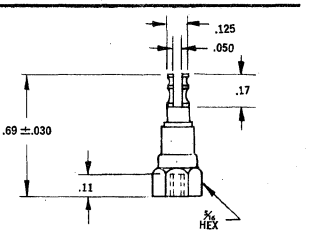
Part No.	Thread
TS-233-8F	4-40
TS-233-9F	6-32



Part No.	Thread
TS-233-8M	4-40
TS-233-9M	6-32



Part No.	Thread
TS-353-8F	4-40 NC-2B
TS-353-9F	6-32 NC-2B



Part No.	Thread
338-2050	6-32

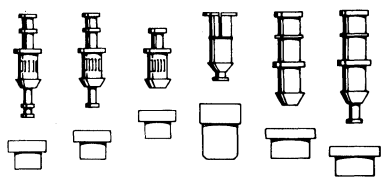
manufacture and design of circuit components

HIRAM JONES
11607 VANOWEN STREET, NORTH HOLLYWOOD, CALIF. 91605
(213) 875-0213

Teflon† Insulated * Press-Type * Terminals and Test Jacks

*** PRESS-TYPE ***

For simple, fast economical installation



TEFLON†

(TFE-FLUOROCARBON) per MIL-P-19468 has outstanding mechanical and electrical properties over a wide range of frequencies and temperatures (−100°C to +250°C), extreme chemical inertness, high heat resistance, zero water absorption and complete anti-hesiveness which make it a superior insulation.

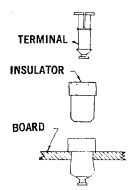
TERMINALS

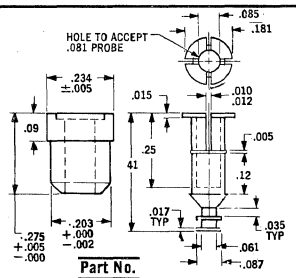
MATERIAL: Half-hard Brass per QQ-B-626, CDA360.
FINISH: Standard plating is Gold per MIL-G-45204. Other finishes supplied on request.

INSTALLATION TOOLS

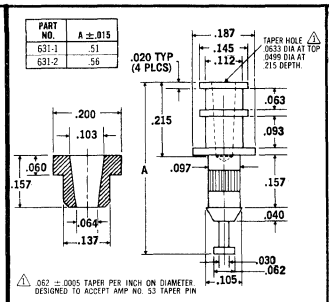
Tools are available for all HIRAM JONES components. Specify Part Number and prefix "S." Example: S-602 Assembly Tool.

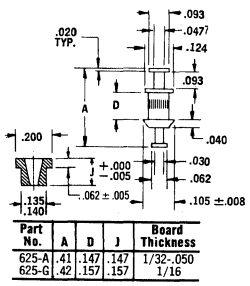
* PRESS-TYPE * Teflon† Insulated Components



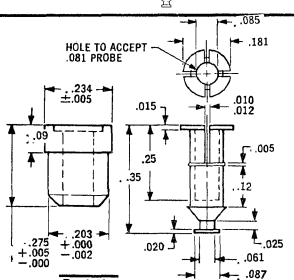


Part No. L-606 — Also available without slots (non-gripping) P/N 606

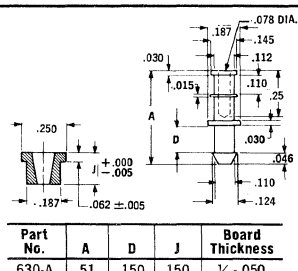




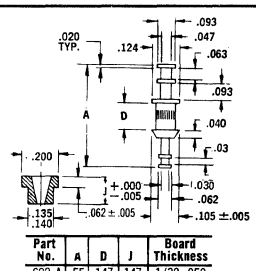
Part No.	A	D	J	Board Thickness
625-A	.41	.147	.147	1/32-.050
625-G	.42	.157	.157	1/16



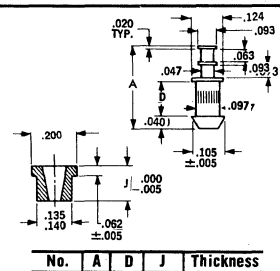
Part No. L-602 — Also available without slots (non-gripping) P/N 602



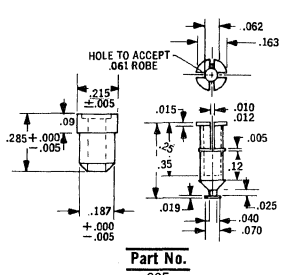
Part No.	A	D	J	Board Thickness
630-A	.51	.150	.150	1/32-.050
630-G	.52	.160	.160	1/16
630-H	.58	.220	.220	1/8



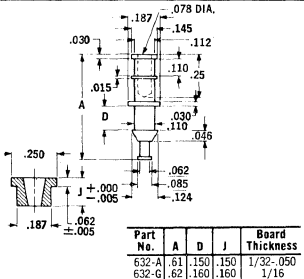
Part No.	A	D	J	Board Thickness
622-A	.55	.147	.147	1/32-.050
622-G	.56	.157	.157	1/16
622-H	.59	.189	.189	1/8



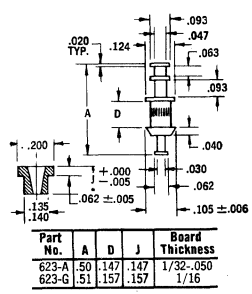
No.	A	D	J	Thickness
626-A	.40	.147	.147	1/32-.050
626-G	.41	.157	.157	1/16



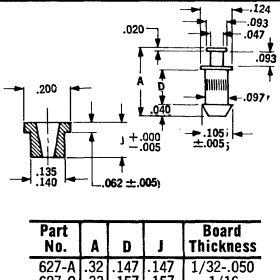
Part No. 605



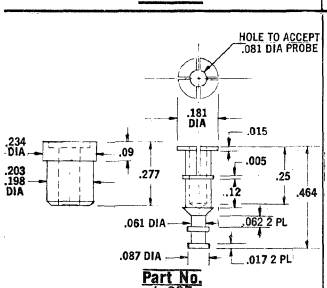
Part No.	A	D	J	Board Thickness
632-A	.61	.150	.150	1/32-.050
632-G	.62	.160	.160	1/16
632-H	.69	.220	.220	1/8



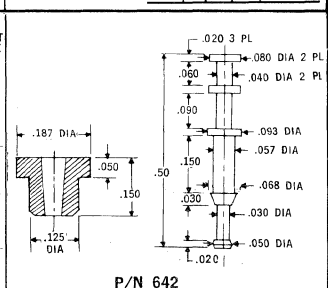
Part No.	A	D	J	Board Thickness
623-A	.50	.147	.147	1/32-.050
623-G	.51	.157	.157	1/16



Part No.	A	D	J	Board Thickness
627-A	.32	.147	.147	1/32-.050
627-G	.33	.157	.157	1/16

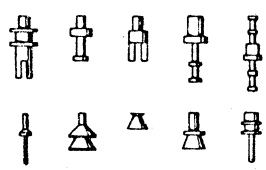


Part No. L-607



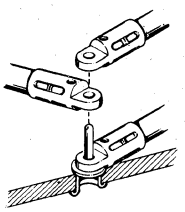
P/N 642

Other Hiram Jones Products:
Non-Insulated Terminals, Test Jacks and Contacts
Printed Circuit, MS and MIL-T-55155 Terminals



HIRAM JONES
manufacture and design of circuit components
11607 VANOWEN STREET, NORTH HOLLYWOOD, CALIF. 91605
(213) 875-0213

9W WIRE TERMINATION SYSTEM



Design Features

SOLDER-WICKING BARRIER

The design of HIRAM JONES 9W Wire Termination Systems provides a solder-wicking barrier, assuring flexibility of the wire and thus minimizing wire failures due to fatigue.

Wires are inserted in the 9W Crimp Terminals and crimped in place. Full engagement of the wire is determined by means of the inspection hole provided in each crimp terminal. The 9W Crimp Terminals are then attached to their mating Terminal Posts and soldered in place.

The entire termination is made without application of solder to the wire itself. It is, therefore, impossible for solder to "wick" up the wire.

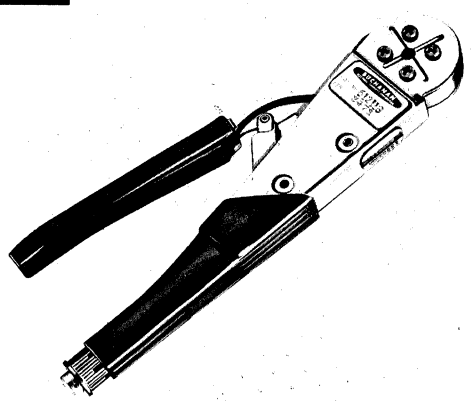
EQUIPMENT SERVICEABILITY

HIRAM JONES 9W Wire Termination System provides all the advantages of a hard wired system without the disadvantages of foreshortening of the service loop when disconnection and reconnection is required. The ease with which connections are made is a feature which is particularly advantageous in systems where connectors are undesirable, yet assemblies or sub-assemblies must be disconnected from time to time for service or replacement. To disconnect HIRAM JONES 9W Crimp Terminals, simply heat and lift off the mating terminal post. Reconnect by resoldering the 9W Crimp Terminals to the terminal post. Neither the mechanical nor electrical joint is affected by repeated removal and resoldering.

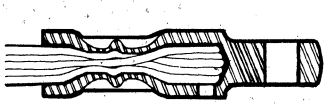
Increased Production Efficiency

By permitting pre-assembly of wires by unskilled operators, HIRAM JONES 9W Wire Termination Systems reduce production costs. Wires may be cut to length, stripped, and the 9W Crimp Terminals crimped in place. Final assembly consists of simply laying the pre-assembled Crimp Terminal on its mating terminal post and soldering in place.

9W MINIATURE MICROCRIMP TOOL



CROSS-SECTION OCTADENT CONFIGURATION



The 9W Miniature Microcrimp Tool (Buchanan No. 612118) is cycle-controlled to assure crimping to the selected depth. Once the crimping operation is started, the tool cannot be opened without completing its cycle.

9W LOCATORS — Specially designed locators are available for each of HIRAM JONES 9W Crimp Terminals. The use of one 9W Miniature Microcrimp Tool and the custom-designed 9W Locators is recommended to guarantee the precise crimp depth setting for each Crimp Terminal. When ordering, specify part number — i.e., 9W-206 Locator.

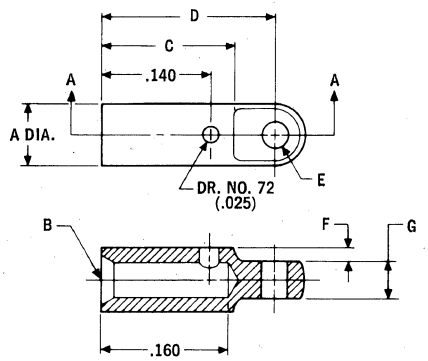
OCTADENT CRIMP — The 9W Miniature Microcrimp Tool produces an octadent configuration which provides uniform displacement of wire and crimp terminal material. The wire strands and the crimp terminal material are formed together in a solid mass with little or no reduction of the mil area of the wire strands.

manufacture and design of circuit components

HIRAM JONES
11607 VANOWEN STREET, NORTH HOLLYWOOD, CALIF. 91605
(213) 875-0213

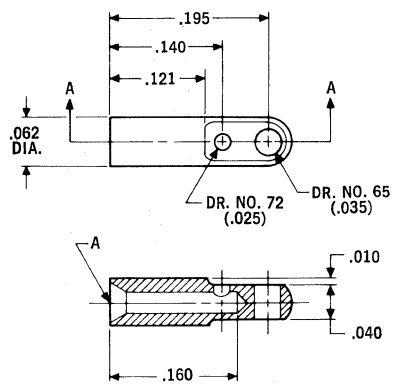
WIRE TERMINATION SYSTEM COMPONENTS

CRIMP TERMINAL



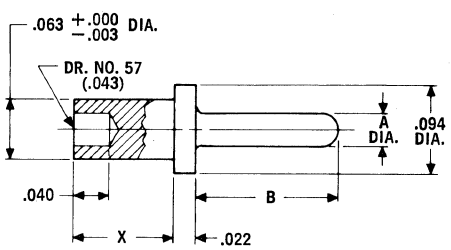
PART NO.	A DIA.	B DRILL	C	D	E DRILL	F	G	WIRE SIZE
9W-206	.078	3/64	.170	.220	.035	.017	.044	20 & 22
9W-230	.094	1/16	.175	.235	.046	.020	.054	16 & 18
9W-209	.078	.028	.170	.220	.046	.017	.044	24 & 26
9W-205	.078	3/64	.170	.220	.046	.017	.044	20 & 22

CRIMP TERMINAL



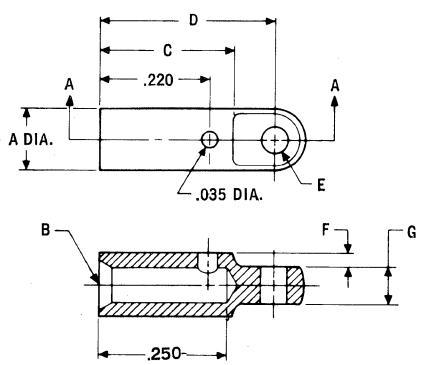
PART NO.	A DIA.	WIRE SIZE
9W-207	.028	24 & 26
9W-208	.020	28 & 30

STANDOFF TERMINAL



PART NO.	A ±.001	B ±.010	X +.004 −.000	T
9W-507-1	.031	.187	.115	3/32"
9W-507-3	.041	.225	.115	3/32"
9W-507-5	.031	.187	.084	1/16"
9W-507-7	.041	.225	.084	1/16"
9W-507-9	.031	.187	.141	1/8"
9W-507-0	.031	.187	.048	1/32"

CRIMP TERMINAL



PART NO.	A DIA.	B DRILL	C	D	E DRILL	F	G	WIRE SIZE
9W-212	.156	.098	.280	.375	.100	.028	.100	12
9W-214	.125	.079	.280	.360	.070	.025	.075	14

TOLERANCES: ±.005 Unless Otherwise Noted.
X = Shank Length T = Board Thickness
Wire size is AWG

MATERIAL: Brass per QQ-B-626, ½ Hard, Composition 22.

FINISH: Electrodeposited Solder Plate over Copper Plate.

Other Sizes Available.
Contact Factory.

eem SI UNITS

RELATIVE QUANTITY SYMBOLS

$\neq$	not equal to
$\approx$	approximately equal to
$\propto$	proportional to
$<$	smaller than
$\leq$	smaller than or equal to
$\ll$	much smaller than
$>$	larger than
$\geq$	larger than or equal to
$\gg$	much larger than
$\equiv$	identical to or equivalent
$\uparrow$	increases
$\downarrow$	decreases

PREFIXES FOR SI UNITS

Multiple	Prefix	Symbol
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p

Quantity	Symbol	SI Unit	Symbol	Derivation
acceleration	a	m s^{-2}	—	velocity/time
acceleration due to gravity	g	m s^{-2}	—	velocity/time
amount of substance	n	mole	mol	mole fraction (n) used
amplification factor	μ	*a ratio*	—	—
angle	$\theta_1,\varphi_1,\alpha_1$	—	—	—
angle of incidence	i	degree or radian	°	—
angle of refraction	r	degree or radian	°	—
angle, Bragg	θ	number	—	—
angle, critical	c	degree or radian	°	—
anode slope resistance	R_A	ohm	Ω	$\Delta V_a / \Delta I_a$
area	A	metres squared	m^2	$l \times b$
atomic number	Z	a number	—	number of protons
Avogadro constant	L, N_A	number	—	—
breadth	b	metre	m	fundamental unit
capacitance	C	farad	F	charge/p.d.
charge, electric	Q	coulomb	C	current × time
charge on electron	e	coulomb	C	$1{\cdot}6 \times 10^{-19}$ C
conductance	G	ohm^{-1}	Ω^{-1}	reciprocal of resistance
current, electric	I	ampere	A	fundamental unit
decay constant	λ	*a ratio*	—	—
density	ρ	kg m^{-3}	—	m/V
distance along path	s	metre	m	fundamental unit
efficiency	η	*a ratio*	—	work output/work input
electrochemical equiv.	z	g C^{-1}	—	mass/charge
electromotive force	E	volt	V	energy/charge
electron	e	—	—	—
energy	E	joule	J	N m
energy, kinetic	E_k	joule	J	N m. $E_k = 1/2mv^2$
energy, potential	E_p	joule	J	N m. $E_p = mgh$
Faraday constant	F	coulomb mol^{-1}	C mol^{-1}	96,500 C mol^{-1}
field strength, electric	E	V m^{-1}	—	potential gradient: p.d./dist.
field-strength magnetic	H	ampere-turns	—	current × no. of turns
flux, magnetic	Φ	weber	Wb	e.m.f/rate of change of flux
flux density	B	tesla	T	flux/area
focal length	f	metre	m	—
force	F	newton	N	kg m s^{-2}
free energy	ΔG	joule	J	—
frequency	f	hertz	Hz	oscillations/time
gas constant	r	joule	J	energy
half-life,radioactivity	$t_{1/2}$	second	s	fundamental unit
heat capacity	C	J K^{-1}	—	quantity of heat/temp. rise
heat of reaction	ΔH	joule	J	heat energy
heat capacity, specific	c	J K^{-1} kg^{-1}	—	heat capacity/mass
heat, quantity of	q	joule	J	energy

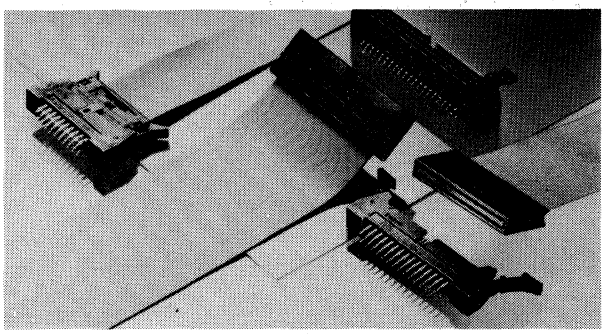
SI UNITS

Quantity	Symbol	SI Unit	Symbol	Derivation
height	h	metre	m	fundamental unit
image distance	υ	metre	m	fundamental unit
inductance, mutual	M	henry	H	induced e.m.f./rate of change of current
inductance, self	L	henry	H	—
intensity of radiation	I	*a number*	—	—
latent heat	L	joule	J	quantity of heat
latent heat, specific	l	J kg^{-1}	—	quantity of heat
latent heat, molar	L_m	joule mol^{-1}	J	quantity of heat
length	l	metre	m	fundamental unit
magnetizing force	H	ampere-turns	—	—
magnetic moment	m	Wb m	—	torque in unit magnetic field
magnification, linear	m	*a ratio*	—	—
mass	m	kilogramme	kg	fundamental unit
mass number	A	*a number*	—	number of neutrons + protons
molar volume	V_m	(dm^3)	—	volume of 1 mole
molar solution	M	*a ratio*	—	moles/dm^3
moment of force	—	N m	—	force × perp. distance
neutron number	N	*a number*	—	number of neutrons
number	n	—	—	—
number of molecules	N	—	—	—
number turns on coil	n	*a number*	—	—
number order spectrum	p	*a number*	—	—
object distance	u	metre	m	fundamental unit
peak current	I_o	ampere	A	see current
peak e.m.f.	E_o	volt	V	see e.m.f.
period	T	second	s	fundamental unit
permeability	μ	H m^{-1}	—	henry/metre
permeability, vacuum	μ_o	H m^{-1}	—	—
permeability, relative	μ_r	*a ratio*	—	$\mu = \frac{\mu}{\mu_o}$
permittivity	ε	F m^{-1}	—	farad/metre
permittivity, vacuum	ε_o	F m^{-1}	—	farad/metre
permittivity, relative	ε_r	*a ratio*	—	$\varepsilon_r = \frac{\varepsilon}{\varepsilon_o}$
potential, electric	V	volt	V	energy/charge
potential difference	V	volt	V	energy/charge
power	P	watt	W	J s^{-1}
pressure	p	pascal	Pa	N m^{-2}: force/area
radius	r	metre	m	fundamental unit
reactance	X	ohm	Ω	E_o/I_o
refractive index	n	*a ratio*	—	—
resistance	R	ohm	Ω	p.d./current
resistivity, electrical	ρ	ohm-metre	—	resistance × length
relative density	d	*a ratio*	—	ρ_{sub}/ρ_{water}
r.m.s. current	$I_{r.m.s}$	ampere	A	see current
r.m.s. voltage	$V_{r.m.s}$	volt	V	see e.m.f.
slit separation	s	metre	m	fundamental unit
tension	T	newton	N	see force
temperature, Celsius	θ	degree C	°C	from kelvin
temp. interval	θ	degree	° or K	—
temp. absolute	T	kelvin	K	fundamental unit
thickness	d	metre	m	fundamental unit
time	t	second	s	fundamental unit
torque	T	Nm	—	see moment
turns ratio	T	*a ratio*	—	n_{sec}/n_{prim}
(unit of electricity)	—	kW h	—	kilowatt × hour
velocity	u,υ	ms^{-1}	—	distance/time
velocity, angular	ω	$second^{-1}$	s^{-1}	angle/time
velocity, e.m.waves	c	m s^{-1}	—	—
velocity of sound	υ	m s^{-1}	—	—
volume	V	metre cubed	m^3	l × b × h
wavelength	λ	metre	m	fundamental unit
work	w	joule	J	force x distance (Nm)
weight	W	newton	N	kg m s^{-2}or mg

Hirose Electric (USA) Inc.
2685-C Park Center Drive
Simi Valley, CA 93065
Phone (805) 522-7958 FAX (805) 522-3217

Hirose Electric (USA) Inc. offers the world's second largest line of electronic connectors, including circular, rectangular, telephone modular, coaxial, printed circuit type, IDC, IC sockets, microwave, fiber optic and other miniature types of connectors.

HIF6H Mini-Flex™ Ribbon Connector (For 0.025 ribbon cable)



Hirose's new HIF6H series Mini-Flex™ miniature connector joins the new HIF6 family of miniature connectors.

The HIF6H connector has an 0.050″ (1.27mm) center mating face and terminates to 0.025″ (0.635mm) flat ribbon cable.

This new connector allows pin #1 to pin #1 and reverse termination. Daisy chain (bus line) connections are possible with the use of a special cover.

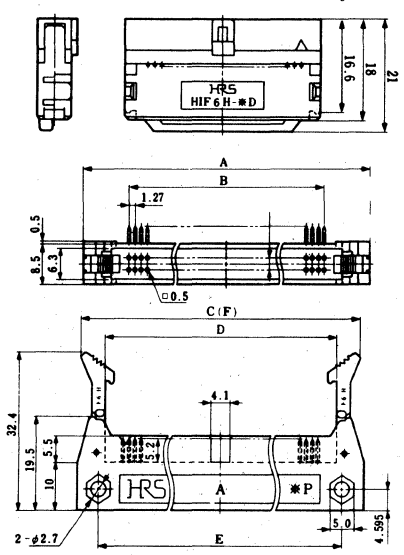
Use of 0.025″ ribbon cable limits overall weight and reduces space needed for cable. Available circuits are 34, 40, 50, 60, 80, and 100. Mating latching header series is HIFH6. HIF6H sockets will also mate to HIF6A+(B) series box pin headers.

Typical high density applications include medical equipment, hand-held instrumentation, robotics, computer peripherals, office equipment, lap-top computers test and measurement equipment.

Item	Material	Finish
Insulator	PBT Resin	Black
Socket contacts	Copper alloy	Selective gold plating
Pin contacts	Brass	Selective gold plating

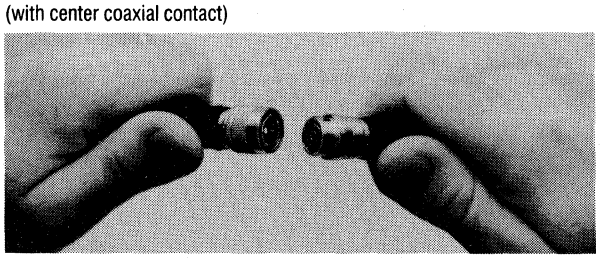
Current rating	0.5A
Voltage rating	125VAC
Insulation resistance	1000MΩ min at DC250V
Dialectric withstanding voltage	300VAC r.m.s. for 1 minute
Contact resistance	*30mΩ max at #DC100mA

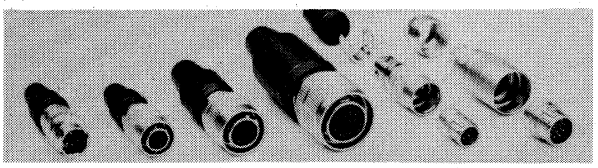
*Including conductor resistance of AWG30 cable.



HR10 Series Snap-Lok™ Circular Connectors

(with center coaxial contact)





The HR10B is another step in the evolution of the HR10 Snap-Lok™ circular connector series while maintaining all the advantages of the HR10.

The HR10B offers a truly unique matched impedance co-ax center contact surrounded by 10 signal contacts. This is packaged in Hirose's standard size 10 shell. By keeping the connector compact, Hirose has not lost sight of the needs and demands for miniaturization and high density. When using the HR10B, you will appreciate how easy it is to handle. The connector is very well balanced and it is a snap to use its easy push-pull coupling mechanism.

With three shell sizes (7mm, 10mm and 13mm) and insert arrangements from 4 to 20 contacts including the newest HR10B in 10mm shell (with 10 signal lines and 50 ohm matched impedance coaxial), there is no problem finding an HR10 Snap-Lok™ circular connector to fit your needs.

Rugged and reliable, HR10 series connectors provide rapid error free mating even under the most adverse conditions.

The HR10B is a very versatile connector. It can be used in any type of electronic equipment where high reliability and high density are needed along with the added feature of the co-ax contact.

Typical applications are: computer, computer peripherals, medical equipment, audio equipment, video equipment, measuring equipment, test equipment and so on.

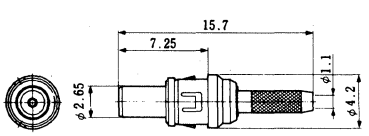
SPECIFICATIONS

HR10B	Material	Finish
Shell	Zinc alloy and brass	Nickel plate Matte finish
Insulator	Glass reinforced 66 nylon	Black
Male contact	Phosphor bronze	Selective gold or silver plating
Female contact	Phosphor bronze	Selective gold or silver plating
Co-ax contact		
Material and finish		
Description	**Material**	**Finish**
Plug shell	Brass	Gold plate
Jack shell	Brass	Gold plate
Insulator	Tetrafluoride resin	
Male contact	Phosphor bronze	Gold plate
Female contact	Beryllium copper	Gold plate
Performance Characteristics	**Ratings**	
Impedance	50 ohm	
Insulation resistance	1000M min at 250VDC	
Contact resistance	Center 6.5m max and outer 4m max at 1ADC	
Withstanding voltage	250VAC r.m.s. for 1 minute	
V.S.W.R.	1.3 max for 1 minute	
Pull force	500gf min	

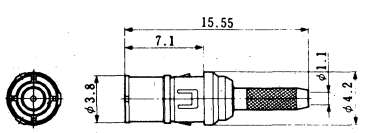
Note: HR10B uses standard HR10A crimp contacts for signal lines.

Part No.	Applicable coaxial contact
HR10B-10R-10SC	HR10B-2.5CP

Part No.	Applicable coaxial contact
HR10B-10P-10PC	HR10B-2.5CJ



Part No.	Applicable cord	Applicable connector
HR10B-2.5CJ	DFS020 (0.8D type)	HR10B-10P-10PC

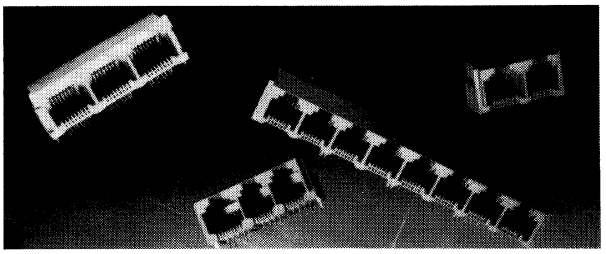


Part No.	Applicable cord	Applicable connector
HR10B-2.5CP	DFS020 (0.8D type)	HR10B-10R-10SC

Hirose Electric (USA) Inc. offers the world's second largest line of electronic connectors, including circular, rectangular, telephone modular, coaxial, printed circuit type, IDC, IC sockets, microwave, fiber optic and other miniature types of connectors.

Hirose Electric (USA) Inc.
2685-C Park Center Drive
Simi Valley, CA 93065
Phone (805) 522-7958 FAX (805) 522-3217

Hirose Modular Gang-Jack Connectors



Hirose has expanded its line of two-, three-, and four-position auto insertable modular Gang Jack connectors with the introduction of four new multi-cavity connectors.

The new Gang Jacks are TM 5RQ-1414 (one 8-contact and one 6-contact), TM 5RQ-2020 (two 6's and one 8-contact), TM 5RSA-2424 with three 8-contact positions and the TM5RJ1-4848, with eight 6-contact positions.

Hirose's side and top entry Gang Jacks offer the convenience and cost savings of a modular connection system in dual, triple, quad and larger packages.

Ideal for OEM manufacturing, Gang Jacks are widely used in designs for modems, phone answering devices, dictation machines, test instruments and office automation products.

Hirose's innovative 'ganged' design aids in inventory control by eliminating the need to stock more than one connector per installation and permits easy PCB loading either automatically or by hand.

Metal PCB "Lok-Tabs" assure a firm hold between connector and board prior to and during wave soldering operations. These unique tabs help form a "solder-rivet" which bonds the Jack and board.

Hirose Gang Jacks feature ABS insulator, suitable for wave soldering and phosphor bronze round terminals with 1.0 microns of gold plating. The low profile Gang Jack is ideal for trimline designs and is available for side entry and top entry mating. A rectangular shape simplifies automatic insertion and the Gang Jack is supplied in a popular grey color with optional colors available.

TM11 Shielded Modular Connectors

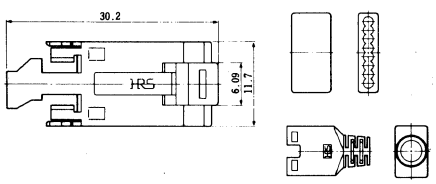
The TM11 series connectors are specifically designed and compatible with industry standards to provide RFI/EMI shielding and protect against ESD discharge. The low profile TM11 has eight signal lines and a grounded shield.

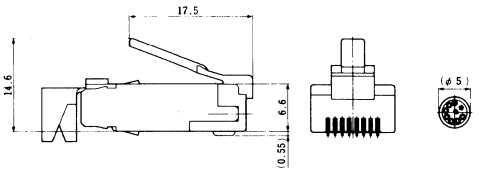
SPECIFICATIONS

Positions:	8 currently available.
Shielding:	Full EMI protection on plug. 8 signal lines plus ground. ESD protection cover for plug. Standard receptacle entry shielded including 4 grounding tabs. Full shielded receptacles available.
Cable Assemblies:	Custom, straight or coiled, 100% tested.
Colors:	Beige or Black Standard, custom colors available.
Electrical:	
Current rating:	500ma
Voltage rating:	125VAC
Insulation Resistance:	100MΩ DC100V min
Dielectric withstanding voltage	500VAC (RMS) (1 min)
Plug Materials:	
Phosphor Bronze contacts, Gold Nickel Plating, Polycarbonate insulator and Copper Alloy/Tin EMI shell.	
Receptacle Materials:	
Phosphor Bronze receptacle, Gold/Nickel plating, PBT or ABS insulator and Copper Alloy/Tin EMI shell.	

APPLICATIONS

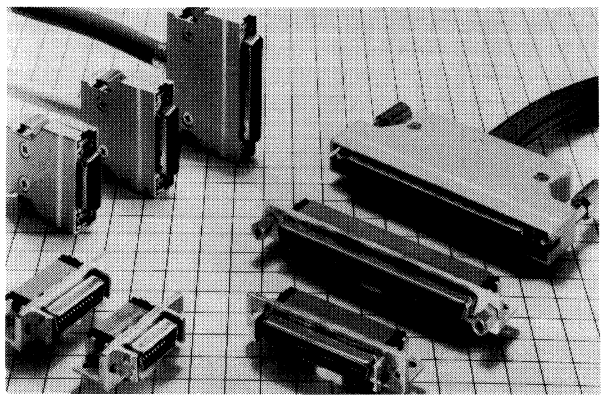
Computers, office automation equipment, and medical equipment are some of the applications for these shielded modular connectors.





MINIATURE DX SERIES I/O CONNECTORS

(0.050 center Mating Face)



Hirose Electric's new miniature bellows contact connector series is currently available in 20, 28, 36, 50, 80 and 100-position shells. Future connectors include 60 to 68 position inserts.

The new 1.27mm (0.050") I/O connector, the "DX",™ incorporates bellows, or "ribbon" type contacts to eliminate problems encountered with other miniature connector designs using pin and socket configurations.

The new "DX"™ design provides positive locking, precise coupling, anti-scooping terminal protection and EMI shielding in a compact and rugged package. Using IDC termination to AWG #28 or #30 wires, this new series offers flexibility of using ribbon or discrete wire cable.

The unique Hirose shell design assures first make/last break gounding and offers complete protection from ESD, to the exposed terminals on the board side, when the connector is unmated. Positive locking is accomplished through the use of an integral "One-Touch" mechanism to assure repeated quick and effortless closures without damage to the lock or the terminals.

SPECIFICATIONS

Items	Standard
Current rating	0.5A
Voltage rating	125VAC
Insulation resistance	250MΩ min at 100VDC
Contact resistance	35mΩ max at 100ADC
Dielectric withstanding voltage	300VAC r.m.s. for 1 minute

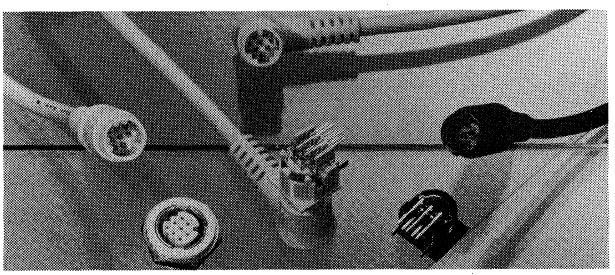
MATERIAL & FINISH

Parts	Materials	Finish
Plug shell	Zinc alloy die-cast	Silver finish
Receptacle shell	Zinc alloy die-cast	Nickel plating
Insulator	PBT resin or equivalent*	Black, UL94V-0
Pin contact	Copper alloy	Selective gold plating
Socket contact	Copper alloy	Selective gold plating

HRS
Hirose Electric (USA) Inc.
2685-C Park Center Drive
Simi Valley, CA 93065
Phone (805) 522-7958 FAX (805) 522-3217

Hirose Electric (USA) Inc. offers the world's second largest line of electronic connectors, including circular, rectangular, telephone modular, coaxial, printed circuit type, IDC, IC sockets, microwave, fiber optic and other miniature types of connectors.

HR12 Series Miniature Circular DIN type connector



Smaller package sizes and FCC regulations are placing more demands on new designs than ever before. To fulfill the need for better and smaller interconnects, HIROSE has developed a number of new 'miniature' I/O connectors.

The HR12 MINIATURE CIRCULAR DIN Type Connector offers a scaled-down circular with Full Shielding, Push-Pull Locking and a Molded Plug/Cord Assembly in a choice of colors.

FEATURES

1. Matte finish helps to maintain appearance and aids in plug/unplug operation.
2. Full Shielding on Plug and Receptacle.
3. PUSH/PULL Locking System.
4. Right Angle Plug/Cord Assembly can be molded for Right or Left orientation.
5. Strain Relief is molded to main body for extra holding.
6. PLUG is available with . . . Straight or Right Angle Configuration.
   RECEPTACLE is available with . . . Straight, Right Angle and Crimp to Wire.
7. Standard Color is Black. Easily available optional colors are Ivory and Grey. Contact HIROSE for other colors.

MATERIAL AND FINISH

Description	Material	Finish
Receptacle	Insulation/PBT (UL94V-0)	
	Grounding shell/brass	
Plug	Glass filled polycarbonate (UL94V-1) PBT (UL94V-0)	
Male contact	Phosphor bronze	Tin or selective gold plating
Female contact	Phosphor bronze	Solder or selective gold plating

PERFORMANCE

Description	Test Data
Contact resistance	30mΩ max
Insulation resistance	DC250V/200 MΩ min
Dielectric withstanding voltage	AC300/1 minute
Voltage rating	AC100/DC140V
Current rating	1 Amp

Description	4	5	8
Outside diameter	ϕ3.8mm	ϕ4.8mm	ϕ4.8mm
Number of positions	4 (max.)	4 (max.)	8 (max.)
Cable/wire type	18 strands ϕ0.08 (AWG #28)	7 strands ϕ0.127 (AWG #28)	7 strands ϕ0.127 (AWG #28)

DN Series (0.050 CTR Mating Face)

- DN series low-profile type, can be mounted in 17.88mm space between two PC boards.
- 2.54mm grid contact position provides easy application for CAD.
- Aluminum die-cast shell and metallic shell reduce the penetration of external E-M noise.
- No. of positions: 20, 26, 36, 50

PERFORMANCE

Current rating	3A
Voltage rating	200VAC
Insulation resistance	5000MΩ min at 500VDC
Contact resistance	20mΩ max at 100mADC
Dielectric withstand voltage	100VAC r.m.s. one minute

MATERIAL & FINISH

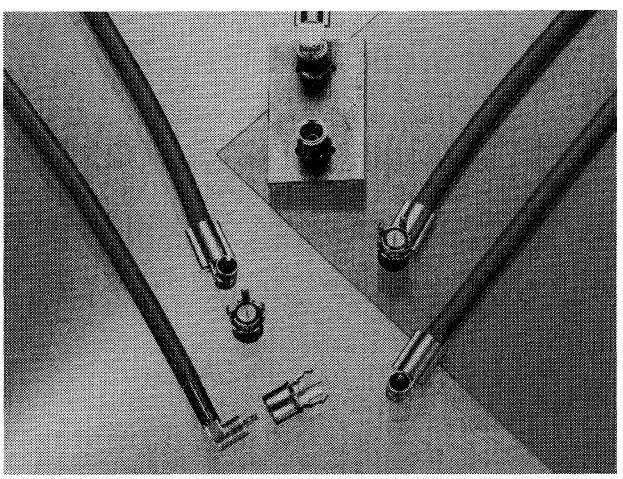
Plug shell	Aluminum alloy	Silver painting
Insulator	Polyester UL94V-0	Black
Contact	Phosphor bronze	Selective gold plating

APPLICATION

OA, FA and HA applications. Communication system. Control system.

FL SERIES Finger Lock Miniature Coaxial Connectors

(Low-profile Microminiature High-frequency Connectors)
DC~1500MHz



The FL (finger-lock) series connectors are low-profile microminiature coaxial connectors intended for high-density packaging of components on printed circuit boards. The FL series is ideal for high-density circuit board wiring in signal transmission applications at high frequencies up to 1 GHz.

FEATURES

(1) Low Profile.
Fully mated, the FL series is only 10.5 mm, (0.413") in height, with a maximum diameter of 5 mm (0.197).

(2) Low Cost.
Unique design and production methods assure quality and competitive pricing.

(3) Fully Solderless Termination.
The FL series plug uses solderless crimping for both center conductors and outer conductors, thus providing improved reliability and savings in assembly time.

(4) High Reliability.
An exclusive Hirose interface design, using combined axial forces, allows consistent performance under vibration and assures simple and positive locking.

(5) High-level Matching.
Maximum V.S.W.R. is only 1.2 at frequencies up to 1 GHz.

(6) Recommended Cable.
Cable #1.5D-QEW and 1.5C-QEW-CW, manufactured by Fujikura Electric Wires Co., Ltd., are recommended for optimal performance. Contact factory for information regarding use with other cable.

APPLICATIONS

Typical applications include cellular telephones, radio communications equipment, electronic measuring instruments, CATV, control units, etc.

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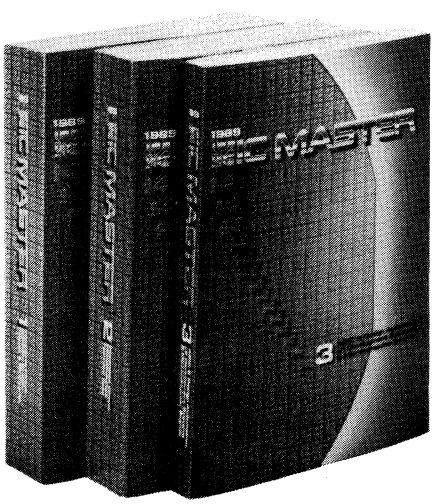

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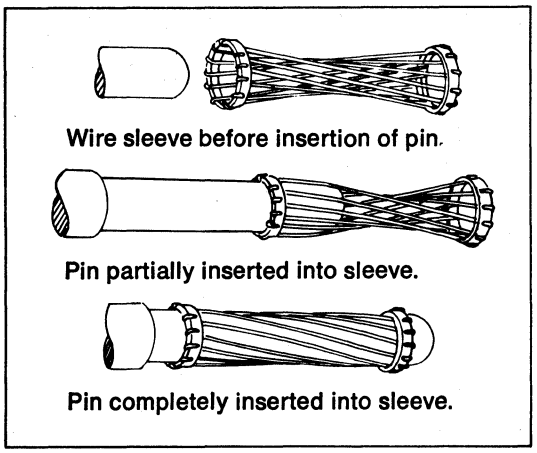
Hypertac® LOW INSERTION FORCE CONNECTORS



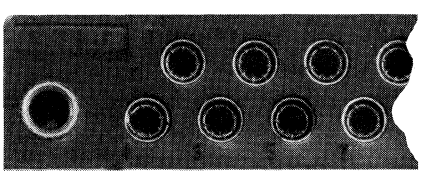
Hypertac® (HYPERboloid conTACt) is an advanced design that satisfies performance requirements previously considered impossible. Radically different in concept (principle is shown in the drawing), it is used in connectors having the highest performance requirements. The distinguishing feature of the Hypertac® socket is the hyperboloid-shaped sleeve formed by wires strung at an angle to the socket's axis. When the pin is inserted into this sleeve, the wires stretch to accommodate it. In so doing they wrap themselves around the pin providing a number of linear contact paths. This superior mating principle offers many advantages:

Lower Contact Resistance: Contact resistance is largely a function of contact area and surface condition. The multiple line contacts in the Hypertac® provide far greater contact area than other contacts of comparable size. The positive wiping action of the wires insures a clean and polished contact surface. Tests have shown Hypertacs® have about ½ the resistance of conventional contact designs.

Higher Current Ratings: The design parameters of the Hypertac® (e.g., the number, diameter, and angle of the wires) may be modified for any requirement. For example, the number of wires (no less than 5) can be increased so the contact area is distributed over a larger surface of the mating pin. Thus, the high current carried by each wire because of its intimate line contact, can be multiplied many times. At the same time the lower resistance reduces heat buildup. Therefore, Hypertacs® are able to handle far greater currents in smaller contact assemblies without the detrimental effects of high temperature.

Lower Insertion-Extraction Forces: Complete encirclement of the pin, along with greater contact area, make high contact forces unnecessary. The spring rate and resultant stress are therefore very low. The smooth insertion-extraction force is so low that even our 700 pin connectors can be easily disconnected without jack screws.

Less Wear and Longer Life: Reduced contact pressure also means a lower rate of wear. The taut wires having a small deflection relative to their span insure constant pressure, voltage drop and current ratings. Hypertacs® have a life of over 100,000 insertion-extraction cycles with almost no degradation in performance. Test pins with 50 micro inches gold plating had no base metal exposed after 8000 cycles (MIL-STD requires only 500 cycles for the same plating thickness).



Greater Reliability: The contact redundancy of multiple wires wrapped around the pin insures the ultimate in contact integrity. Elasticity of the wires also enables the socket to accommodate bent or misaligned pins.

Exceptional Electrical Continuity Under Shock and Vibration: The low mass and resultant low inertia of the wires relative to their resilience enables them to follow the most abrupt or extreme excursions of the pin without loss of contact. Tests conducted over the entire frequency range showed no discontinuity even when measured as low as 8 nanoseconds at 50 g rms. Moreover, the contact area is not limited to a single plane. It extends 360° around the pin and is uniform over its entire length. The three dimensional symmetry of design guarantees electrical continuity regardless of the direction or intensity of external or inertial forces.

Higher Uniformity: Machined rather than stamped parts, simple contact surfaces and selective plating before assembly avoids the possibility of shadow effects, gradients or trapped residues which could affect performance. Excellent physical and performance uniformity is thereby assured within each unit as well as perfect repeatability from unit to unit.

Requirements for connectors are such, that no matter how many details are incorporated in a brochure or catalog, we cannot include all types and variations. We would be pleased to consider your particular requirements; simply furnish all pertinent data to our Customer Service Department.

HYPERTRONICS CORPORATION
16 Brent Drive, Hudson, MA 01749-2904
Toll free: 800-225-9228 Fax: (508) 568-0680
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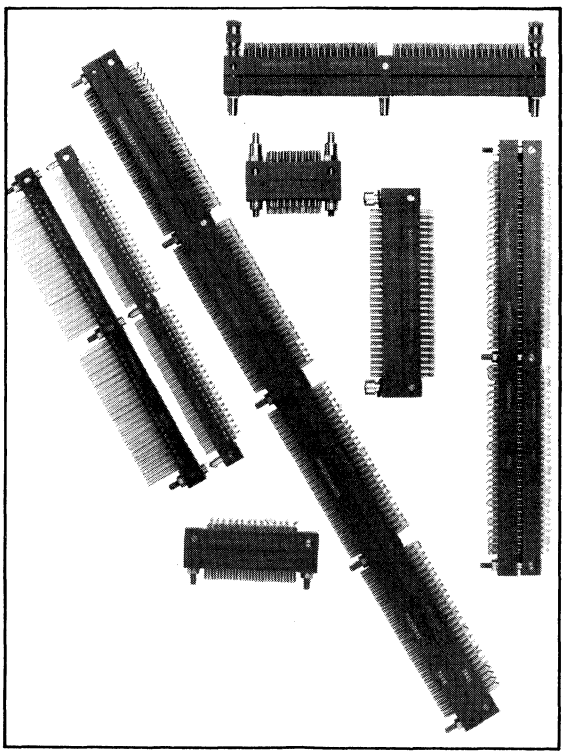
SUBMINIATURE 2-PIECE P.C. BOARD CONNECTORS

NOW QPL'D

Low Insertion Force with Removable Contacts



1.27mm (.050") grid spacing [KA section of catalog].

17, 29, 33, 41, 53, 62, 65, 72, 80, 84, 96, 98, 120, 126, 160, or 320 contacts.

Rated Current: 3 Amps/contact.

Breakdown Voltage: 1,200 Volts.

Temperature Range: −55° +125°C (−65° +260°F).

Various mounting styles and locking hardware available.

Various tail styles available: wire wrap,® crimp, solder cup, straight p.c. solder, right angle p.c. solder, surface mount, and others.

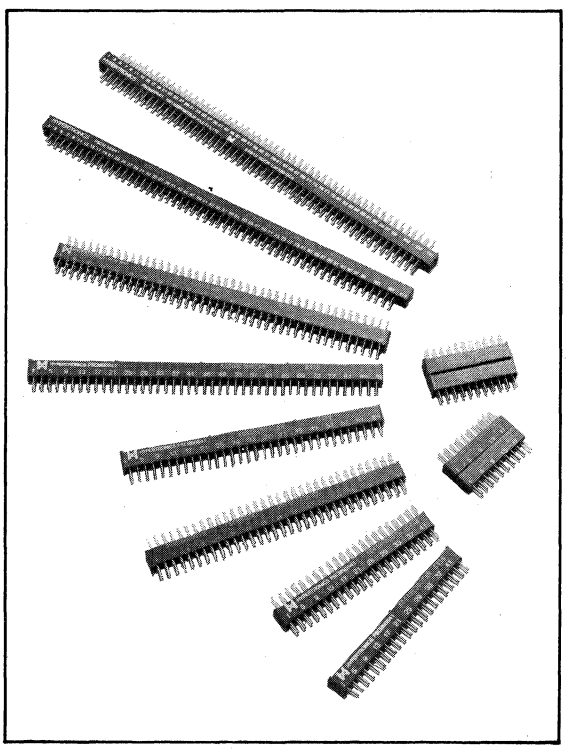
KA Series has more than 15,000 possible combinations.

QPL'ed to D55302/159-164

SUBMINIATURE LOW PROFILE 2-PIECE P.C. BOARD CONNECTORS

NEW

Low Insertion Force



2.54mm X 2.54mm (.100" X .100") center spacing [KG section of catalog].

4 through 90 contacts.

Rated Current: 2.5 Amps/contact.

Breakdown Voltage: 1,200 Volts.

Temperature Range: −55° + 105°C (−65° + 220°F).

Various tail styles available: crimp, solder cup, straight p.c. solder and right angle p.c. solder.

Various mounting styles available: p.c. board parallel sandwich [as thin a profile as 6.1mm (.240")], p.c. board to cable, chassis to chassis, low profile daughter board to mother board and others.

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INDIVIDUAL CONTACTS

Low Insertion Force

NEW

Individual pins and sockets are available for those applications where special constraints prohibit the use of multi-pin connectors.

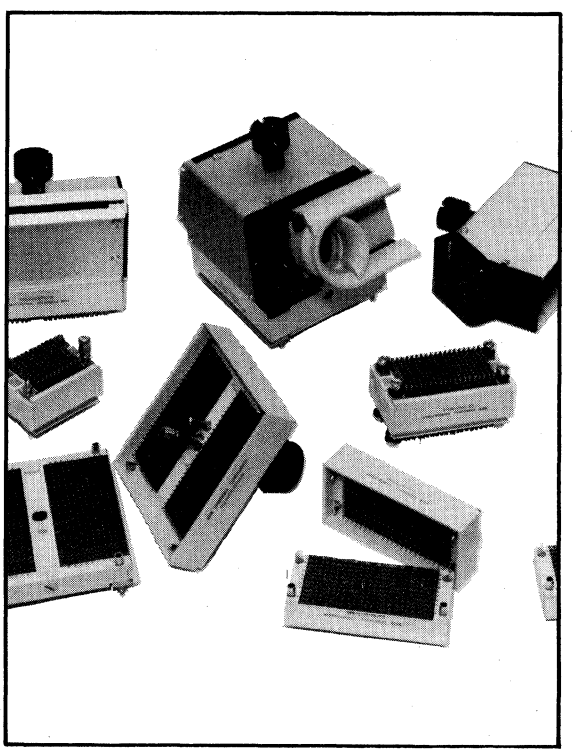
Rated Current: 2.5 to 500 Amps/contact.

Breakdown Voltage: Depends on mounting.

Temperature Range: −55° to 600°C
(−65° + 1100°F).

MINI-MODULAR HIGH DENSITY CONNECTORS

Low Insertion Force



Like the modular series, this mini-modular series also allows you to build your own connector quickly and inexpensively without special tooling. However, with the mini-modular series, much higher density and pin counts are possible. Virtually any design requirement can be met by assembling signal and power contacts in various combinations [N section of catalog].

Building Blocks:
- 5 contacts @ 9 Amps/contact;
- 6 contacts @ 7 Amps/contact;
- 10 contacts @ 5 Amps/contact;
- Breakdown Voltage: 2,250 Volts; 1,500 Volts.
- Temperature Range: −55° +105°C (−65° +220°F).
- Types: signal and power.

Frames:
- 7 thru 35 building block units.
- 25 thru 700 contacts.
- Also available with keys, hoods, cable clamps, float mountings or jack screws.

N Series has over 40,000 possible combinations.

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MINIATURE QUICK-DISCONNECT CIRCULAR CONNECTORS

Low Insertion Force

This series features fast, secure and easy-to-use coupling action [D section of catalog].

3, 7, 9, & 12 contacts.

Rated Current: 3 thru 8 Amps/contact.

Breakdown Voltage: 2,000 thru 2,250 Volts.

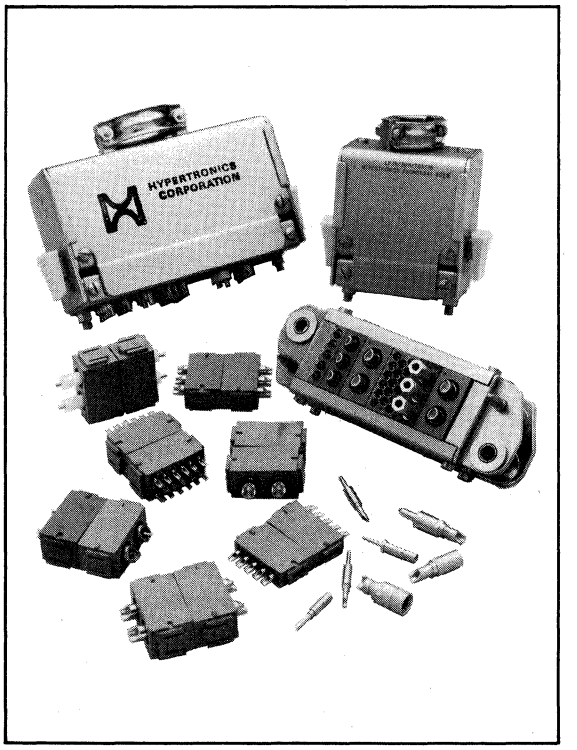
Temperature Range: −40° +85°C (−40° +185°F).

These connectors are also available in a high temperature plastic suitable for sterilization [−40° +125°C (−40° +260°F)].

Available in special colors as well as standard black and gray.

MODULAR CONNECTORS

Low Insertion Force



These do-it-yourself connectors, on the building block principle, offer a wide variety of combinations to meet any design requirement. Combinations to 255 contacts per connector are possible [L section of catalog].

Building Blocks:

- 2, 3, 5 or 17 contacts.
- Rated Current: 5 thru 200 Amps/contact.
- Breakdown Voltage: 2,000 thru 12,000 Volts.
- Temperature Range: −55° +125°C (−65° +260°F).
- Types: signal, power, coax, high voltage or shielded cable.

Frames:

- 4 thru 30 building block units.
- 8 thru 255 contacts.
- Also available with keys, hoods, cable clamps, float mountings or jack screws.

L Series has over 40,000 possible combinations.

We have the ability to mold the connector as one piece when your design moves from prototype to production, thus giving low cost and fast delivery in all phases of your product.

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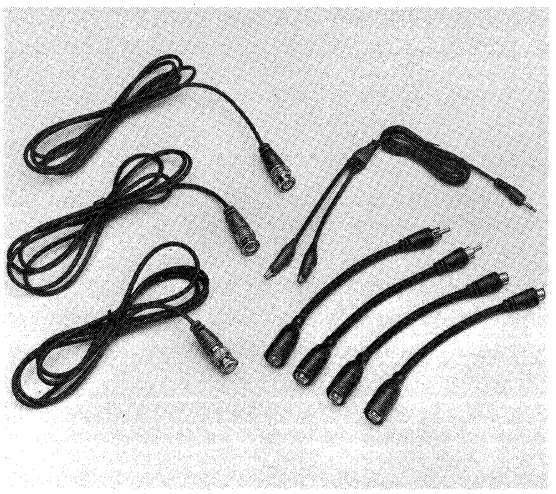
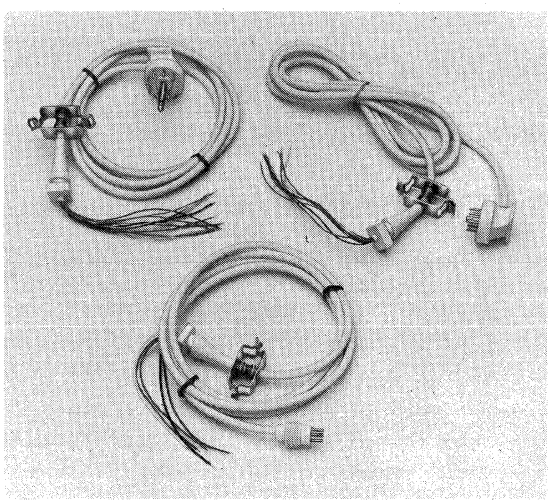


TOOLING SERVICES AVAILABLE FOR CUSTOM MOLDED CABLE ASSEMBLIES AND CUSTOM CONNECTORS

DESIGN OPTIONS

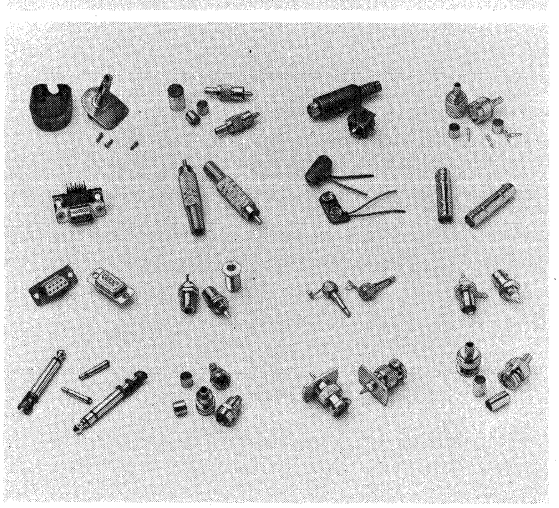
CABLE
- Conductor Type
  - Solid, Stranded, & Gauge
  - Number of Conductors
  - Paired or Unpaired
- Dielectric Type
- Types of Shields
  - Braided Copper
  - Foil/Drain Wire
  - Foil/Braid
  - 100% Shield
- Insulation of Conductors & Jacket
- Other

TERMINATION
- Stripped and Tinned
- Terminals
- Connectors
- Other



CONNECTORS

- AUDIO
- F CONNECTORS
- BNC
- TNC
- DIN CONNECTORS
- D SUB CONNECTORS
- UHF
- PCB MOUNT COAXIAL



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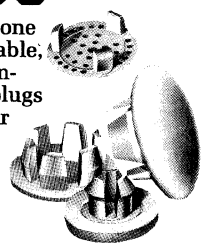
HOLE PLUGS

Fit niches no one else can. Durable, attractive, non-conductive, plugs match all your needs. Many sizes, styles, and colors available.

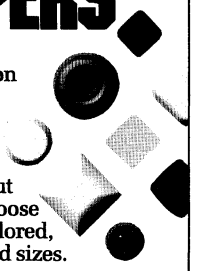


SNAP-IN FOOT

Attached 2 prong mechanism requires no screws or rivets for installation. Excellent traction and shock absorption without marking surfaces.

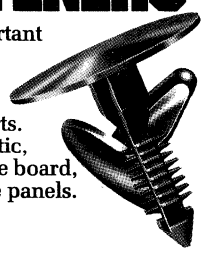
ADHESIVE BUMPERS

Self-adhesive bumpers press on easily and stay on without fasteners. Skid and scratch resistant. Kiss cut for easy use. Choose from clear or colored, many shapes and sizes.



PUSH FASTENERS

Realize important labor savings with these easy to use, one piece parts. Ideal for plastic, metal, particle board, and openable panels.

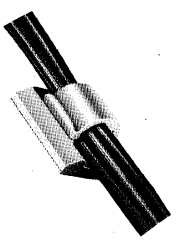


REMOVABLE RIVET

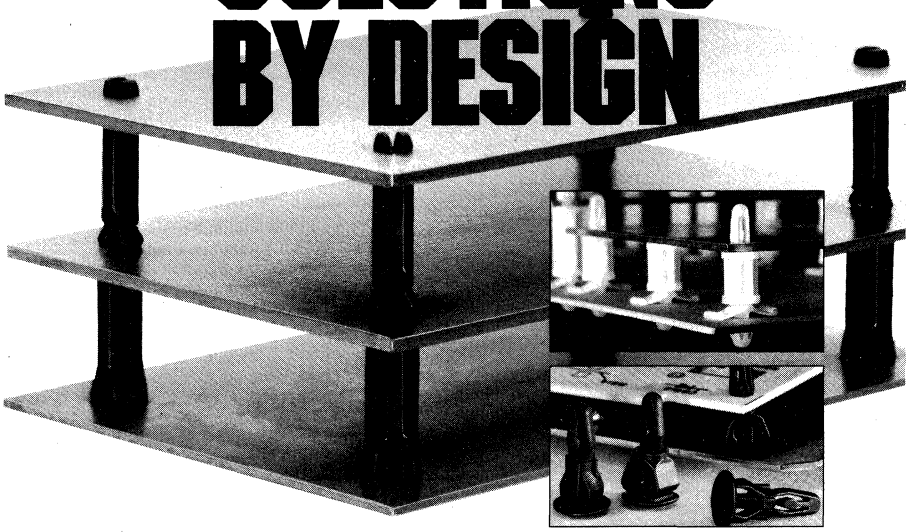
Unique design of the removable rivet allows dismantling of access panels with no special tools in blind applications where access to the back of the panel is impossible.

WIRE MANAGEMENT

Neatly organize wires, cords, and cables with Fastex's UL recognized adhesive backed and snap-in clips ... the industry's broadest line.



SOLUTIONS BY DESIGN



Stack up an extra board with space- and labor-efficient double board bottom entry supports. This and many more Fastex ideas in PCB supports, LED holders and components can work for you.

STACK UP BETTER WITH A LEADER

From circuit board supports to 4,000 other solutions that work, Fastex specialty fasteners and components mean quality you can count on every day.

With unmatched design and engineering capabilities, Fastex is first in providing unique fastener solutions. Innovations that reduce assembly time, use fewer parts and improve performance and durability.

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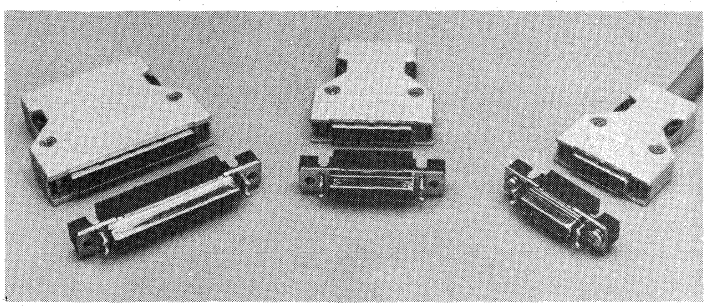
LOW PROFILE, HIGH DENSITY CONNECTORS

TX7 SERIES CONNECTORS

Designed specifically for state-of-the-art electronic systems, the TX7 Series two-piece PCB connectors offer high density packaging with 0.050″ (1.27mm) contact spacing.

- Designed by the industry.
- Currently in production and available now.
- Real estate efficient.
- Stackable.
- Quick Release.
- Full family of connectors.



ORDERING INFORMATION

RECEPTACLE TX7 - XX X - D2 LT 1 - 4 X X

- Connector Series
- Number of contacts (26, 36, 60)
- Contact Sex (S = Socket)
- Contact Row (D2 = 0.050 × 0.100)
- Terminal Configuration (LT = Right angle)
- Terminal (1 = 0.110″/2.8mm long)
- Applicable panel screw size (4 = #4-40)
- Pin Style
  - H = Hook pin
  - E = Grounding lug, threaded #4-40
- Finish
  - 1 = 0.1μm min. gold over 1.5μm min. nickel
  - 2 = 0.3μm min. gold over 1.5μm min. nickel
  - 3 = 0.76μm min. gold over 1.5μm min. nickel

IDC CONNECTOR AND HOOD TX7 - XX P H1 - D2 P 1 X X

- Series
- Number of contacts of applicable connector (26, 36, 60)
- Contact Sex (P = Pin)
- Hood Style (H1 = Standard straight)
- Contact Row (D2 = 0.050 × 0.100)
- Termination Style (P = IDC)
- Applicable wire size (1 = #28 and AWG #26)
- Applicable wire
  - Blank = Discrete wire
  - F = Flat ribbon cable
- Finish
  - 1 = 0.1μm min. gold over 1.5μm min. nickel
  - 2 = 0.3μm min. gold over 1.5μm min. nickel
  - 3 = 0.76μm min. gold over 1.5μm min. nickel

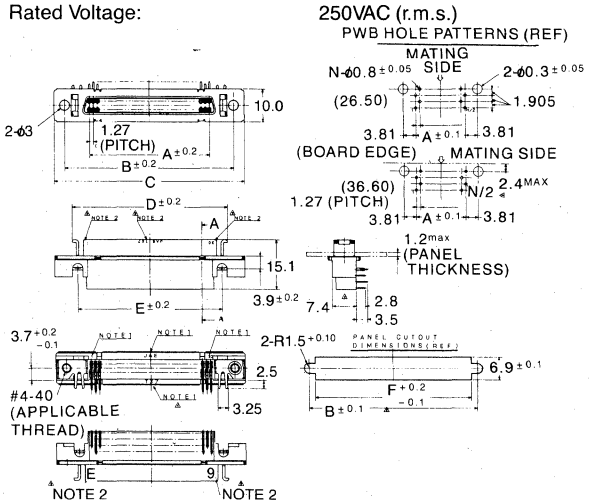
CABLE

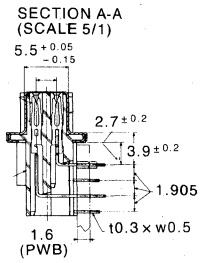
UL2990

Conductor: Size AWG #28 and AWG # 26, 7pcs/0.127mm

SPECIFICATIONS

Rated Current:	0.5A DC
Rated Voltage:	250VAC (r.m.s.)
Operating Temperature:	– 40°C to 80°C
Mating Cycles:	500 cycles min.
Contact Resistance:	25mOhms max.
Insulation Resistance:	
Individual contact	100MOhms min. (after tests)
Dielectric Withstanding Voltage:	
Individual Contact	500VAC (r.m.s.) for 1 minute





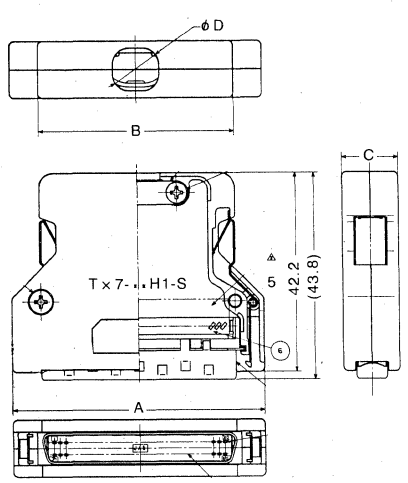


TABLE 1: DIMENSIONS

PART DESCRIPTION	N	A	B	C	D	E	F
TX7-26S-D2LT-4H*	26	15.24	30.48	37.1	26.24	22.86	26.64
TX7-36S-D2LT-4H*	36	21.59	36.83	43.4	32.59	29.21	32.99
TX7-50S-D2LT-4H*	50	30.48	45.72	52.3	41.48	38.1	41.88
TX7-60S-D2LT-4H*	60	36.83	52.07	58.7	47.83	44.45	48.23

TABLE 1: DIMENSIONS

PART DESCRIPTION	N	A	B	C	φ D MAX.
TX7-26PH1-D2P1.-E	26	32.6	20.4	10.0	7.7
TX7-36PH1-D2P1.-E	36	39.0	26.8	10.0	8.4
TX7-50PH1-D2P1.-E	50	47.9	35.7	10.0	9.5
TX7-60PH1-D2P1.-E	60	54.2	42.0	12.0	10.7

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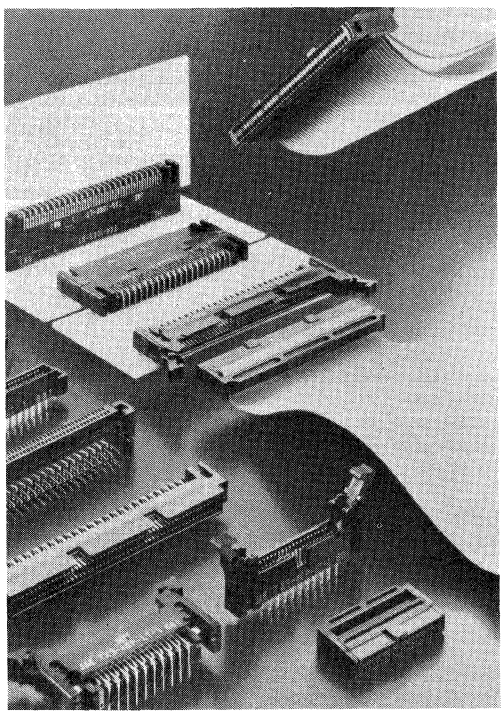
LOW PROFILE, HIGH DENSITY CONNECTORS

TX1–TX5 SERIES CONNECTORS

The TX1–TX5 Series of connectors offer two-piece PCB connectors with 0.050″ (1.27mm) high density contact spacing. This series is available for board-to-board and board-to-cable applications, permitting a high degree of design flexibility. Typical applications include computers, business machines, industrial controls, telecommunications, audio-visual equipment, test equipment and applications requiring high density packaging.



ORDERING INFORMATION

TX1 IDC Socket:	For flat ribbon cable on 0.025″ centers
TX2 IDC Socket:	For flat ribbon cable on 0.050″ centers
TX3 Pin Header:	Standard and short latch types. Straight and right angle through hole.
TX4 Socket Receptacle:	Straight or right angle through holes for board-to-board connections. With or without mounting ears. Optional expansion posts with mounting holes, and polarization keys available.
TX5 Pin Header:	Straight or right angle through holes for board-to-board connections. With or without mounting ears. Optional expansion posts with mounting holes, and polarization keys available.

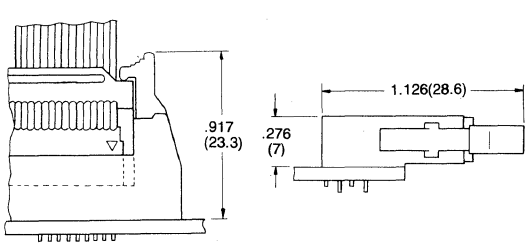
SPECIFICATIONS

Contact Layouts:	
TX1/TX2/TX3	20, 26, 30, 34, 50, 60, 68, 80, and 100
TX4/TX5	40, 50, 60, 68, and 100
Operating Voltage:	250VAC (r.m.s.)
Current Rating:	0.5ADC max.
Dielectric Withstanding Voltage:	500VAC (r.m.s.) for 1 minute
Insulation Resistance:	100mOhms min.
Contact Resistance:	25mOhms max.

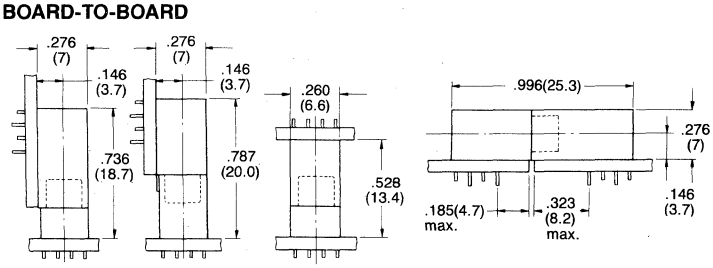
MATERIALS & FINISHES

Insulator:	P.B.T., black. UL flammability rating UL94V-0.
Contact:	Phosphor bronze
Contact Finish:	
Contact Area	Gold over nickel
Termination Area	Tin
Expansion Post	Phosphor bronze/tin plate

BOARD-TO-CABLE

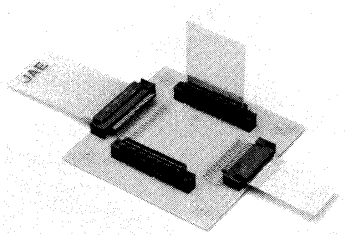


BOARD-TO-BOARD



PCB CONNECTORS

EDGE CARD CONNECTORS



PB 22 SERIES

These high density, lightweight edge card connectors have contact spacing of just .050″ and are ideal for compact, high density packing applications.

- Straight through hole and right angle through hole types.
- Two rows of the right angle through hole solder tails are staggered, and the third row is a surface mount configuration.
- 40 and 60 contact layouts.
- 0.5A rated current.
- Applicable PCB thickness of .039″ and .063″.

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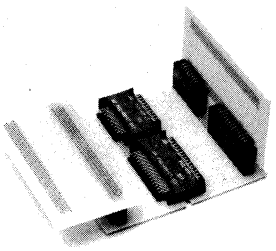
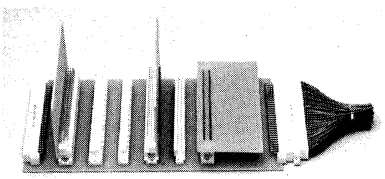
PCB CONNECTORS

TWO PIECE CIRCUIT BOARD CONNECTORS



PICL

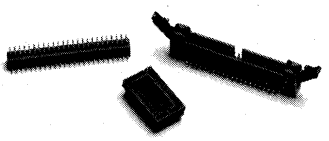
These two-piece, miniature connectors are ideal for use in products having limited space for PC interconnections.
- High contact density (.050" pitch).
- Board-to-board applications.
- Through hole, right angle and straight interconnections.
- Optional polarizing key available.
- 30, 40, 50 and 60 contact layouts.
- 5A rated current.



ME03 SERIES

The ME03 Series of two-piece circuit board connectors are compatible with IEC Pub. 603-2 and DIN41612 Standards. Used worldwide as internationally standard connectors, their space saving construction makes them suitable for use in communications, telecommunications and computer equipment, and with 19" card frames designed to IEC Standards.
- .100" contact spacing.
- Low insertion/removal force.
- Dual wipe contact configuration.
- Low cost.
- 64, 90 and 96 contact layouts.
- 3A rated current.
- Crimp and press fit termination options available.

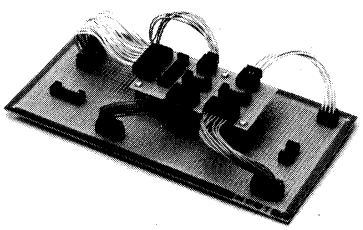
MODULAR INTERCONNECTIONS & IDC FLAT RIBBON CABLE CONNECTORS



PS SERIES

These IDC connectors are designed for flat ribbon cable applications. The PS Series includes socket connectors for discrete wires; board mounting pin headers with pin posts; and high performance connectors compatible with MIL-C-83503
- High contact density (.100" pitch).
- Board-to-board and board-to-cable applications.
- Crimp-socket contacts for high volume termination of discrete wires.
- 10, 16, 20, 26, 30, 34, 40, 50 and 60 standard contact layouts.
- 3A rated current.
- Insulators constructed of UL94V-0 flame-retardant material.

MODULAR INTERCONNECTIONS & IDC FLAT RIBBON CABLE CONNECTORS

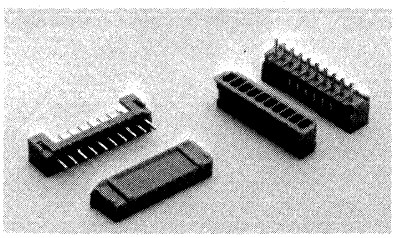


LX SERIES

Similar to the PS Series and other .100" pitch connectors, the LX Series offers high density packaging with its 2mm contact pitch.
- High contact density (.079", 2mm pitch).
- Dual wipe crimp contacts.
- Straight through hole and right angle through hole pin headers with tinned leads.
- 4 to 30 contact layouts (even numbers).
- 3A rated current.
- Accommodates 26 to 36AWG wire.

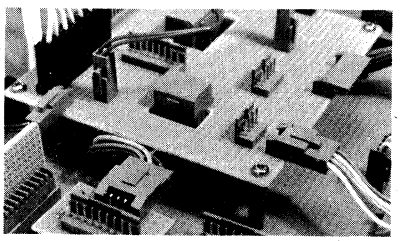
IL-S/T SERIES

The low cost IL-S/T Series of connectors feature compact spacing of 2.00mm for high contact density. Suitable for cable-to-board applications, with combinations of straight, right angle and bottom pin headers, and crimp sockets.
- 2.00mm contact spacing.
- Mated height is just .295-inches.
- Light locking mechanicsm.
- 2 to 15 contact layouts.
- 3A rated current.
- Accommodates 24 to 28AWG wire.



PS-LA SERIES

Low cost and compact, the PS-LA Series of low profile connectors are ideal for high density packaging in board-to-cable applications.
- Mated height is just .374-inches.
- Locking mechanism to resist high vibration levels and tensile forces.
- Dual wipe contact crimp contacts.
- Straight through hole and right angle through hole pin headers.
- 4 to 20 contact layouts.
- 3A rated current.
- Accommodates 24 to 28 AWG wire.



IL SERIES

These general purpose connectors are designed for indirect PCB interconnect applications in commercial/industrial and consumer electronics equipment. The IL Series includes the Original IL Series; the IL/G/J/M/P Series; and the IL-W Series.
- High contact density (2.00mm and 2.5mm pitch).
- Low cost.
- IDC, crimp and through hole types.
- Friction locking mechanism.
- 3A rated current.
- Accommodates 22 to 28AWG wire.

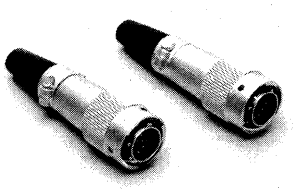
INPUT/OUTPUT CONNECTORS CIRCULAR CONNECTORS

SRC SERIES

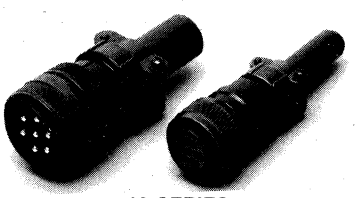
The low cost and lightweight SRC Series of miniature circular connectors is ideal for use in general purpose applications where size and reliability are primary considerations.
- Panel-to-cable and cable-to-cable applications.
- Machined or stamped contacts.
- Solder termination.
- Insulators constructed of UL94V-0 flame-retardant material.
- Three shell styles and four shell sizes with pin and socket inserts provided.
- 3, 5, 7, 10 (2 versions), 16 (2 versions) and 24 contact layouts.
- 5A and 10A current ratings.
- Recognized under UL Component Program, File No. E-67741(S).
- Bayonet and threaded couplings.

JA SERIES

This highly reliable series of general purpose circular connectors is similar to MIL-C-5015 for use in applications not requiring a MIL-qualified connector. Available in a wide variety of styles, sizes and contact layouts, the JA Series offers combinations of receptacles, plugs and accessories for panel-to-cable and cable-to-cable connections for all types of electronic equipment.
- Similar to MIL-C-5015.
- High performance and high reliability.
- Available in most popular contact arrangements.
- 13A to 150A current rating.
- Solder and crimp terminations are available.



SRC SERIES



JA SERIES

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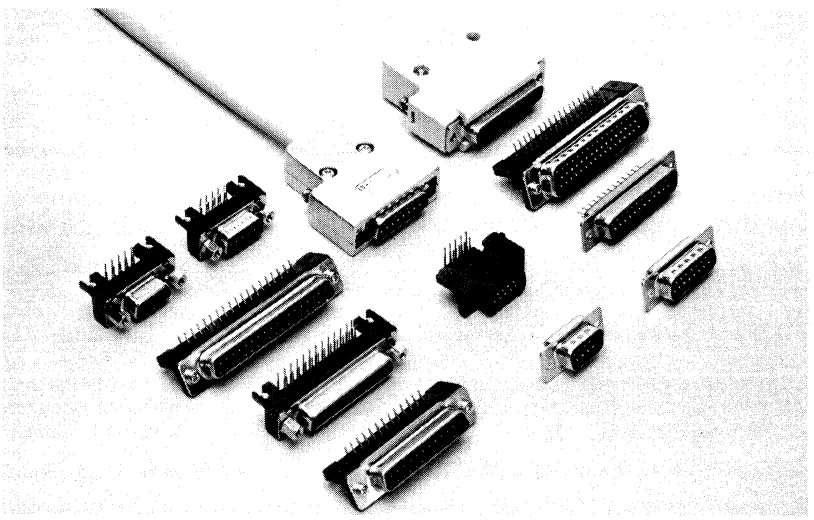
INPUT/OUTPUT CONNECTORS

RECTANGULAR CONNECTORS



D SUBMINIATURE

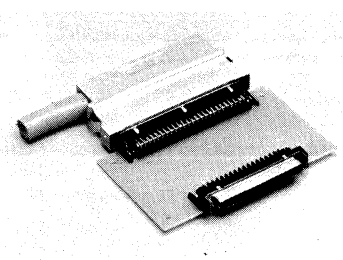
The versatile D Subminiature Series of rectangular connectors is available in a wide variety of styles. These popular general-purpose connectors are ideal for use in applications such as computers, office equipment, telecommunications, instrumentation and industrial equiment. Features include:
- Five shell sizes and five contact arrangements (9, 15, 25, 37 and 50 contacts).
- Various termination styles: crimp, insulation displacement, solder, PCB through hole, and wire wrapping.
- Optional accessories for cable-to-panel, cable-to-PC board (straight and right angle mount), and cable-to-cable applications.

Standard D Subminiature Connectors
- **D*U:** Low cost general purposes connectors with crimp or through hole contacts.
- **D*SP:** Insulation displacement contacts for ribbon cable.
- **D*-N:** Low cost, stamped contact connectors with solder or through hole contacts.
- **D*M:** High reliability connectors available with standard contacts, or contact arrangements to accommodate coaxial contacts.
- **D*MA:** High reliability, crimp contact type connectors.

EMI Shielding D Subminiature Connectors

Designed to meet the demand for noise suppression and FCC regulations controlling electromagnetic interference (EMI). Features include lightweight and compact aluminum or plastic clamp hoods and nickel-plated metal shells with grounding dimples on plug side of connector to ensure firm connections and meet shielding requirements.
- **D*U-F:** Crimp terminations.
- **D*SP-F:** Insulation displacement terminations.
- **D*-F-N:** Solder terminations.
- **D*LC:** Through hole terminations.
- **D*-AF-N:** Through hole terminations.

Low Cost D Subminiature Connectors
- **D*LC:** PCB connectors with right angle through hole contacts. 5A rated current. 9, 15, 25, and 37 contact layouts. Standard or metric screw-lock assembly. Grounding lugs available.

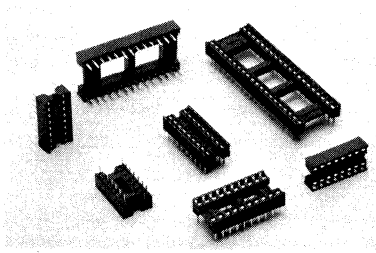


D05 SERIES

These connectors combine the standard features of D Subminiature connectors with .100″ (2.54mm) contact spacing and EMI shielding.
- Receptacle with .100″ right angle through hole contacts.
- Plug with metal front shell and easy-termination contacts.
- Clamp hood junction shell has a spring locking mechanism and provides for EMI protection of complete connector.
- 20, 26, 36 and 50 contact layouts.
- 5A current rating.

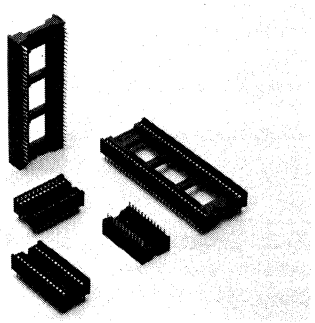
SOCKETS

IC Sockets



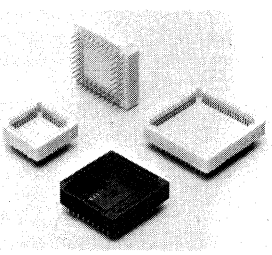
DICF SERIES E

These low profile sockets have the bottom side of the insulator filled and sealed with a special synthetic resin to prevent any flux invasion from the bottom while soldering. In addition, the contact portion of the socket is protected from scattered flux invastion from the top with masking tape.
- Low profile design.
- .197″ (5.0mm) socket height.
- Dual wipe contacts.
- Gold or tin plated contacts.
- 8, 14, 16, 18, 22, 24, 28, 40 and 42 contact layouts (additional layouts available).
- 1A rated current.



DICS SERIES

The DICS Series of IC sockets is suitable for "shrink"-type DIP ICs with spacing of .070″ (1.78mm) spacing between adjacent contacts.
- Low profile.
- Highly reliable, with double contact configuration and excellent spring characteristics.
- UL approved insulator material.
- Anti-flux version also available.
- 24, 28, 30, 42, and 64 contact layouts.
- 1A rated current.



DICS SERIES

The PLPS Series of chip carrier sockets accepts the JEDEC type A plastic leaded chip carriers with 44, 68 and 84 leads on .050″ (1.27mm) spacing.
- Solder posts on .100″ (2.54mm) square grid.
- Index for polarization.
- Excellent spring action of preloaded contacts.
- Standoffs and drain holes for easy PC board cleaning.
- Substrate removal tool available.

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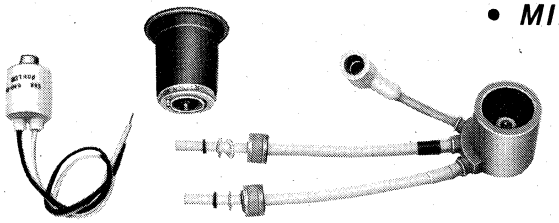
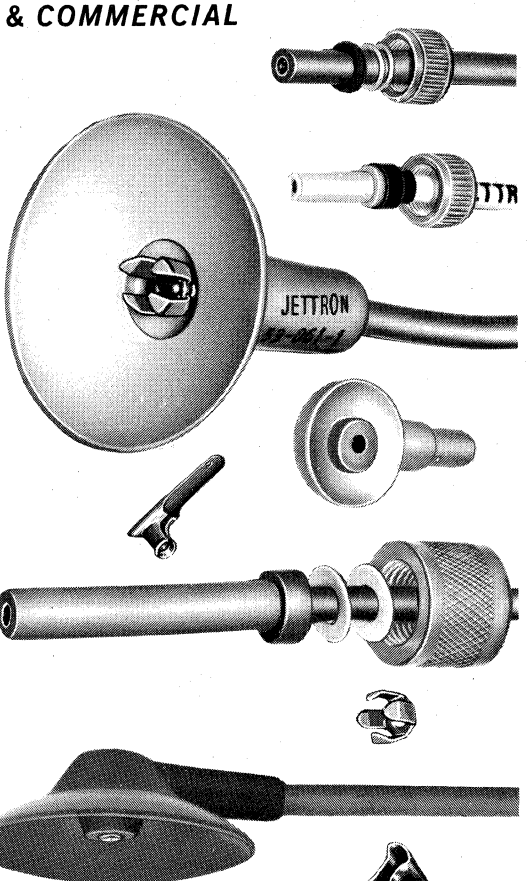


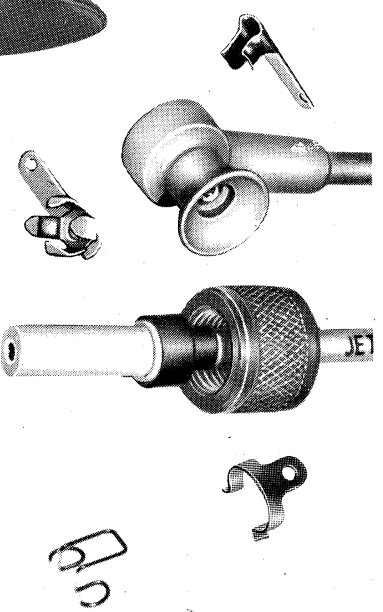
MAGNETRON CONNECTORS

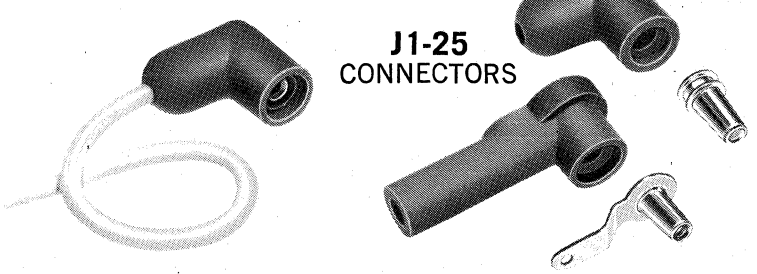
JETTRON'S



Extensive line of high voltage connections to 50KVDC including molded silicone CRT anode leads (leakproof & corona free), in-line connectors, splices, and CRT anode connector kits for customer assembly. Potting contacts of BeCu for the JEDEC J1-21, J1-22, J1-25, J1-30, and J1-32 anode terminals.

Custom Molding
IN SILICONE RUBBER





J1-25
CONNECTORS

Page 1 of 2

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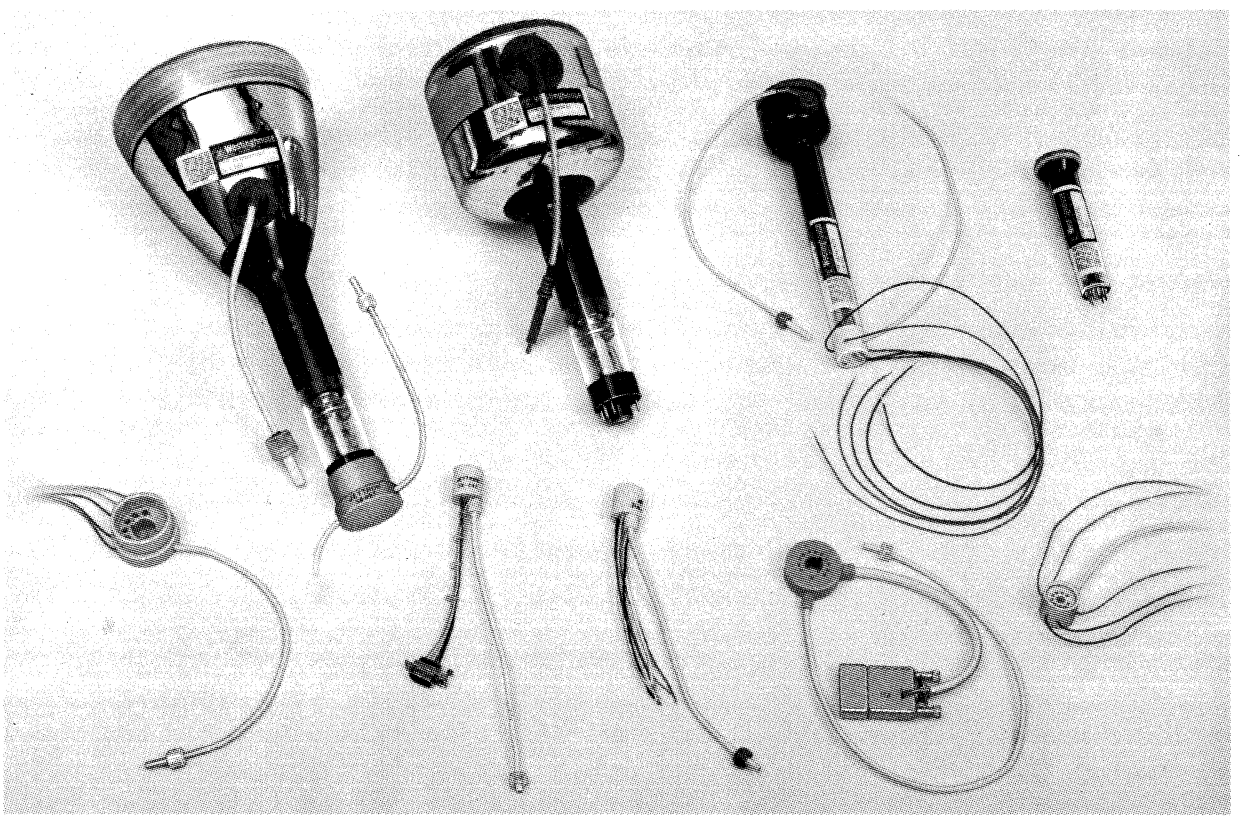
★ NOTE: HIGHER KV RECEPTACLES ARE MADE ON SPECIAL ORDER FOR TEST AND APPLICATION REQUIREMENTS

SILICONE CRT ANODE CONNECTORS

BONDED TO WIRE INSULATION OR KITS FOR EASY ASSEMBLY



SILICONE CRT BASE CONNECTORS

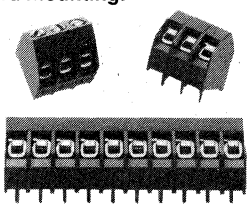
jettron®
JETTRON PRODUCTS, INC.
56 ROUTE 10. P.O. BOX 337E. EAST HANOVER. N.J. 07936
Telephone (201) 887-0571 • Fax (201) 887-4182

JOLO
13921 NAUTILUS DRIVE, GARDEN GROVE, CA 92643
(714) 554-6840 / TWX 910-595-1138 / FAX 714-554-0306
ELECTRONIC INTERCONNECTION HARDWARE

TERMINAL BLOCKS

BB-118-XX SERIES

Available in 2, 3, 4, and 10 positions for P.C. board mounting.



FEATURES

- Can be butt mounted to provide multiplicity of sizes i.e. 3, 6, 9, 10, 12, 13 etc.
- 45° angled entry for easy wire insertion
- Polyester insulator ensures low moisture absorption and excellent electrical characteristics
- Pedestal design permits flux removal after soldering
- Anti-vibration design

No. of Terminals	A	B	JOLO Part Number
2	.400 (10,16)	.200 (5,08)	BB-118-02
3	.600 (15,24)	.400 (10,16)	BB-118-03
4	.800 (20,32)	.600 (15,24)	BB-118-04
10	2.000 (50,80)	1.800 (45,72)	BB-118-10

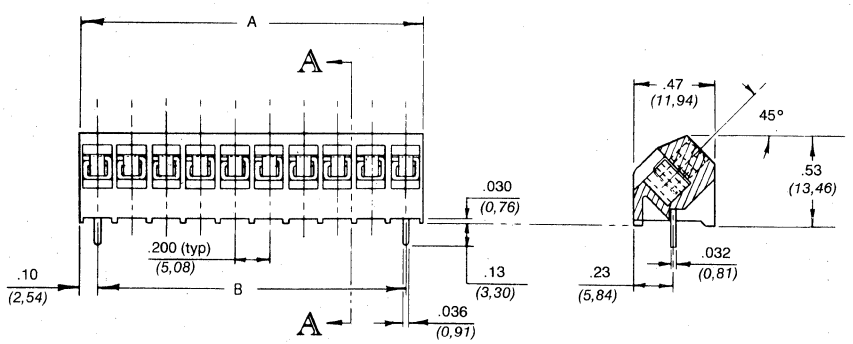
BB-118 Series recognized under the component program of Underwriters Labs, Inc.

MATERIALS

Terminal:	Brass, tin plated
Spring:	Stainless steel
Insulator:	Polyester (blue)
Screws:	Steel, zinc plate with yellow chromate finish

SPECIFICATIONS

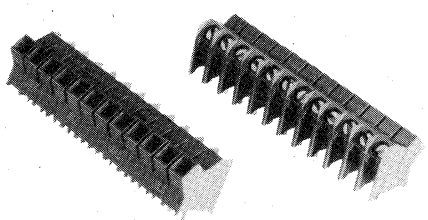
Current Rating:	15 amps
Voltage Rating:	250 Volts RMS
Wire Size:	#16 AWG maximum
Resistivity:	Minimum 10^{10} ohms between terminals at 40°C and 95% relative humidity



NOTE: Recommended P.C. Board Hole Size: .058 (1,47) diameter.

BB-122-XX SERIES

Available in 3,4, 6, 8, 10 and 12 positions for P.C. board mounting.



FEATURES

- Designed to conform to IEC Standard 348
- 45° angled entry – permits easy access where space is limited for high density packaging
- Butt mountable – provides multiplicity of sizes
- Polyester insulator ensures low moisture absorption and excellent electrical characteristics
- Pedestal design – permits flux removal after soldering
- UL 94 V-O flammability rating
- Captive stainless steel screws

No. of Terminals	A	B	JOLO Part Number
3	.600 (15,24)	.400 (10,16)	BB-122-03
4	.800 (20,33)	.600 (15,24)	BB-122-04
6	1.200 (30,49)	1.000 (25,41)	BB-122-06
8	1.600 (40,65)	1.400 (35,57)	BB-122-08
10	2.000 (50,81)	1.800 (45,73)	BB-122-10
12	2.400 (60,98)	2.200 (55,89)	BB-122-12

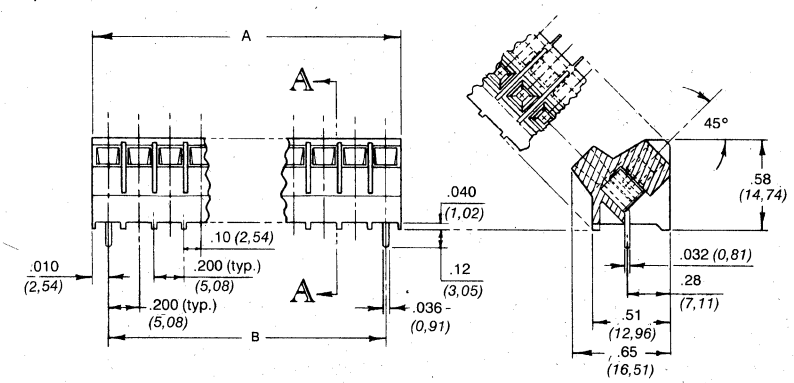
MATERIALS

Terminal:	Brass, tin plated
Spring:	Stainless steel
Insulator:	Polyester (blue)
Screws:	Stainless steel, unplated

SPECIFICATIONS

Current Rating:	15 amps
Voltage Rating:	500 Volts RMS
Wire Size:	#16 AWG maximum
Resistivity:	Minimum 10^{10} ohms between terminals at 40°C and 95% relative humidity

• For other materials and/or finishes, consult factory



NOTE: Recommended P.C. Board Hole Size: .058 (1,47) diameter.

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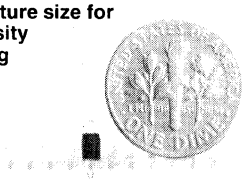
ELECTRONIC INTERCONNECTION HARDWARE

P.C. TEST JACKS

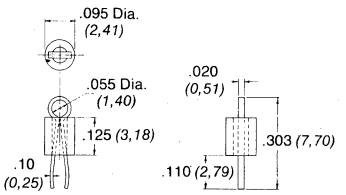
Vertical Test Jack (Snap-In)

Snaps into .042"–.050" diameter holes
Subminiature size for high density packaging



FEATURES

- For use with hook or clip probes
- Stands less than .200" off P.C. board
- Self-supporting during wave soldering
- Mounts on .100" grid pattern
- Color coded insulators



Contact Material	Contact Finish	JOLO Series
Phosphor Bronze	.0002" electrotin	SPCJ-123-XX*

*XX=Insulator color code

FEATURES (Common to Horizontal Types)

- For use with .080" probes
- Pedestal design enables flux removal
- Closed entry prevents insertion of probes greater than .085" diameter
- Eleven colors available

MATERIALS

Insulator:	Nylon
Contact:	Beryllium Copper or Phosphor Bronze
Support:	Brass (Tri-Mount Only)

SPECIFICATIONS

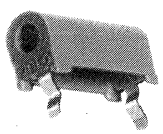
Current Rating:	5 amps
Operating voltage:	1500 V.R.M.S. at sea level
Contact resistance:	5 milliohms max. at 5 amps
Probe insertion force:	8 oz. min., 5 lbs. max.

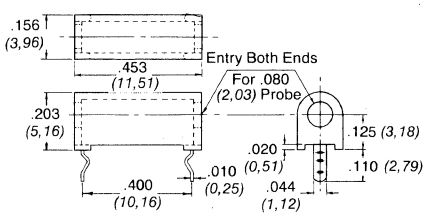
INSULATOR COLOR CODE

white	–01	blue	–07
red	–02	yellow	–08
black	–03	gray	–09
brown	–04	purple	–10
green	–05	natural	–11
orange	–06		

Horizontal Test Jack (Snap-In) (.400" Centers) Double Entry

Snaps into .060" dia-holes



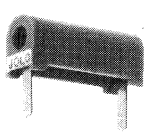


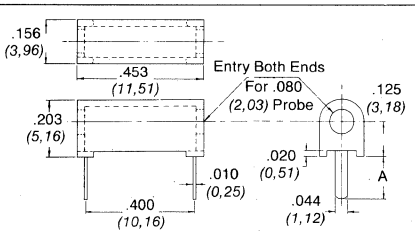
Contact Material	Contact Finish	JOLO Series
Beryllium Copper	.00001" Gold	PPCJ-124-XX*

*XX=Insulator color code

Horizontal Test Jack (.400" Centers) Double Entry

Designed to conform to MIL-C-39024/11

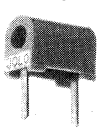


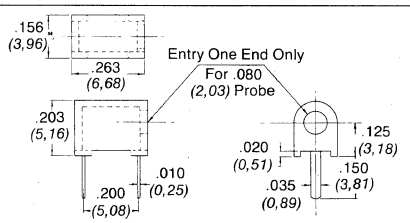


Contact Material	A	Contact Finish	JOLO Series
Beryllium Copper	.150 (3,81)	.00001 gold	PPCJ-100-XX*
Beryllium Copper	.150 (3,81)	.00003 gold	PCJ-100-XX
Beryllium Copper	.150 (3,81)	.0002 electrotin	SPCJ-100-XX
Phosphor Bronze	.150 (3,81)	.0002 electrotin	SPCJ-200-XX
Phosphor Bronze	.110 (2,79)	.0003 tin/lead	LPCJ-219-XX

*XX=Insulator color code

Horizontal Test Jack (.200" Centers) Single Entry

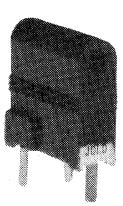


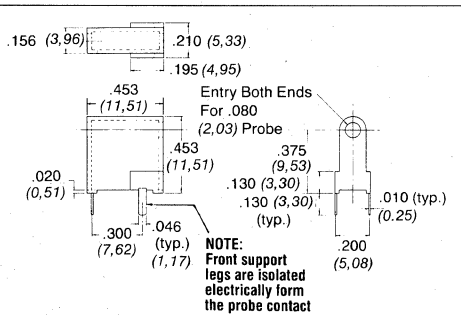


Contact Material	Contact Finish	JOLO Series
Beryllium Copper	.00003 gold	PCJ-112-XX*
Beryllium Copper	.0001 solder	EPCJ-112-XX

*XX=Insulator color code

Horizontal Test Jack (Tri-Mount) Double Entry





Contact Material	Contact Finish	JOLO Series
Phosphor Bronze	.00003 gold**	PCJ-216-XX*
Phosphor Bronze	.0002 electrotin	SPCJ-216-XX

**For gold finish, only the contact is gold plated; the support legs are elecrrotin plated.

*XX=Insulator color code

- For other materials and/or finishes, consult factory

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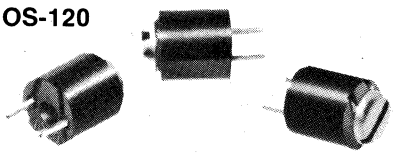
ELECTRONIC INTERCONNECTION HARDWARE

OPTION SWITCH

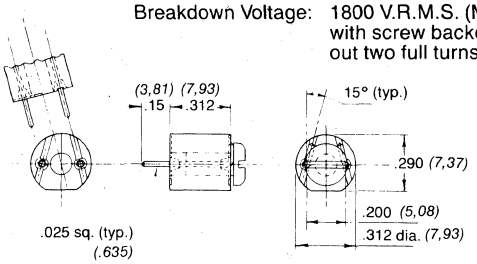
OS-120



FEATURES
- Simple, reliable design
- Cost effective
- Vibration resistant
- P.C. Mount
- .200" centers
- Polyester insulator
- UL 94 V-O flammability rating

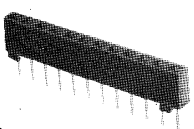
MATERIALS
Terminal: Phosphor Bronze, tin plated
Screw: Steel, tin plated
Insulator: Polyester (black)

SPECIFICATIONS
Current Rating: 10 amps @ 110 V.R.M.S.
Breakdown Voltage: 1800 V.R.M.S. (Min.) with screw backed out two full turns



STRIP SOCKETS

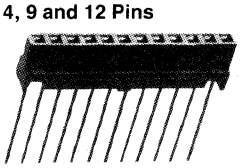
P.C. Type
SS-109-1-XX SERIES
Available in 4, 7, 8, 9, 12, 14, 16, 18, and 20 Pins.



FEATURES
- Can be used to mate with pins up to .025 (0,64) square without degradation in performance and reliability.
- Closed entry insulator facilitates I.C. insertion and protects contacts.
- Pedestal design enables flux removal and air circulation.
- End gripping of I.C. leads maximizes retentive force and prevents contact overstress.
- Slim silhouette for high density packaging.

SPECIFICATIONS
Contact Resistance: (with tin plate)
8.3 milliohms (average) initial
10.0 milliohms (average), 100 cycles
Breakdown Voltage: 1150 V.R.M.S. (adjacent contacts)
Insulation Resistance: 1 × 10^6 megohms (min.) @ 500 V.D.C.
Insertion Force: .15 lbs./contact (average)

Wrapost Type
SS-109-2-XX SERIES
Available in 4, 9 and 12 Pins



FEATURES
- Replaceable contacts.
- Closed entry insulator facilitates I.C. insertion and protects contacts.
- Pedestal design enables flux removal and air circulation.
- End gripping of I.C. leads maximizes retentive force and prevents contact overstress.
- Slim silhouette for high density packaging.

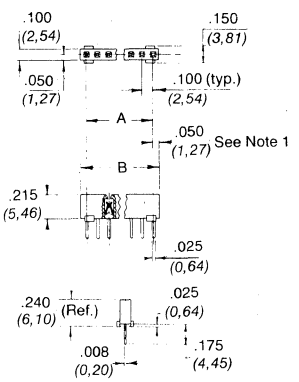
SPECIFICATIONS
Contact Resistance: (with .00001 gold)
9.7 milliohms (average) initial
10.1 milliohms (average), 100 cycles
Breakdown Voltage: 1550 V.R.M.S. (adjacent contacts)
Insulation Resistance: 1 × 10^6 megohms (min.) @ 500 V.D.C.
Insertion Force: .23 lbs./contact (average)

MATERIALS
Contact: Phosphor Bronze
Insulator: Glass-filled Polyterephthalate

No. of Contacts	A	B	Contact Finish	JOLO Part Number
4	.300 (7,62)	.400 (10,16)	.00001 gold	SS-109-1-04
4	.300 (7,62)	.400 (10,16)	.0002 tin	SS-109-1-04C
7	.600 (15,24)	.700 (17,78)	.00001 gold	SS-109-1-07
7	.600 (15,24)	.700 (17,78)	.0002 tin	SS-109-1-07C
8	.700 (17,78)	.800 (20,32)	.00001 gold	SS-109-1-08
8	.700 (17,78)	.800 (20,32)	.0002 tin	SS-109-1-08C
9	.800 (20,32)	.900 (22,86)	.00001 gold	SS-109-1-09
9	.800 (20,32)	.900 (22,86)	.0002 tin	SS-109-1-09C
12	1.100 (27,94)	1.200 (30,48)	.00001 gold	SS-109-1-12
12	1.100 (27,94)	1.200 (30,48)	.0002 tin	SS-109-1-12C
14	1.300 (33,02)	1.400 (35,56)	.00001 gold	SS-109-1-14
14	1.300 (33,02)	1.400 (35,56)	.0002 tin	SS-109-1-14C
16	1.500 (38,10)	1.600 (40,64)	.00001 gold	SS-109-1-16
16	1.500 (38,10)	1.600 (40,64)	.0002 tin	SS-109-1-16C
18	1.700 (43,19)	1.800 (45,73)	.00001 gold	SS-109-1-18
18	1.700 (43,19)	1.800 (45,73)	.0002 tin	SS-109-1-18C
20	1.900 (48,26)	2.035 (51,69)	.00001 gold	SS-109-1-20
20	1.900 (48,26)	2.035 (51,69)	.0002 tin	SS-109-1-20C
No. of Contacts	**A**	**B**	**Contact Finish**	**JOLO Part Number**
4	.300 (7,62)	.400 (10,16)	.00001 gold	SS-109-2-04
4	.300 (7,62)	.400 (10,16)	.0002 tin	SS-109-2-04C
9	.800 (20,32)	.900 (22,86)	.00001 gold	SS-109-2-09
9	.800 (20,32)	.900 (22,86)	.0002 tin	SS-109-2-09C
12	1.100 (27,94)	1.200 (30,48)	.00001 gold	SS-109-2-12
12	1.100 (27,94)	1.200 (30,48)	.0002 tin	SS-109-2-12C

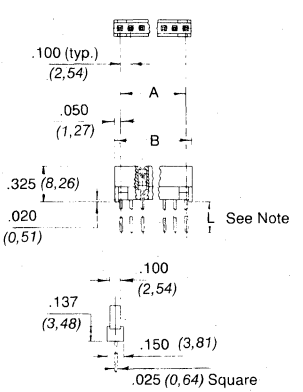
• For other materials and/or finishes, consult factory

SS-109-1-XX Series



NOTES:
1. For 20 contact socket, this dimension is .050 (1,27) at one end and .085 (2,16) at the other end.
2. Recommended P.C. Board Hole Size: .033 (.84) minimum.

SS-109-2-XX Series



NOTE:
L = .615 (15,62) for three level, specify SS-109-2-XX series
L = .400 (10,16) for two level, specify SS-109-2-XX (.400) series
L = .300 (7,62) for single level, specify SS-109-2-XX (.300) series

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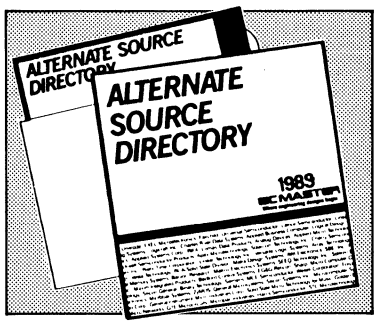

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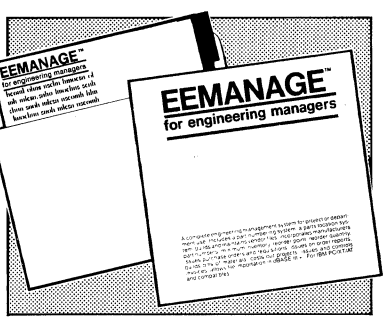

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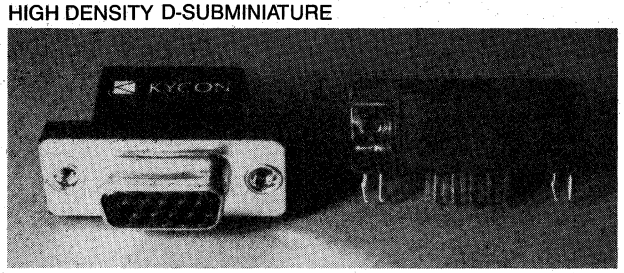
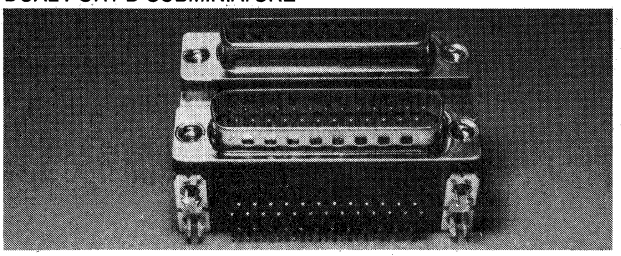
K66 SERIES
HIGH DENSITY D-SUBMINIATURE



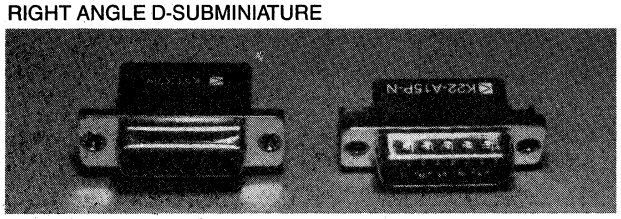
- 15 Contacts in a 9 pin shell and 26 contacts in a 15 pin shell
- Bright tin shells for exceptional conductivity and grounding
- Fixed contacts, tuning fork design, right angle termination, P.C. mount, .350 footprint.
- With grounding bracket
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, black color
- Contact material; phosphor bronze gold-plated
- Current rating: 5 amps • Temperature rating: – 55° to + 125°C

K42 SERIES
DUAL PORT D-SUBMINIATURE



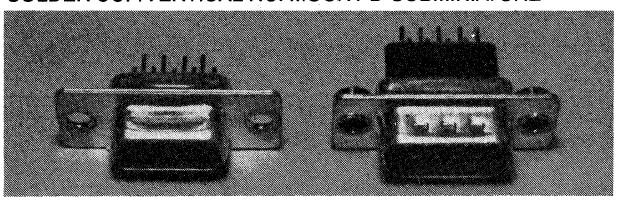
- Both DB9 and DB25 sizes, any gender combination available
- Bright tin shells for exceptional conductivity and grounding
- Right angle termination, P.C. mount • Center to center: .625″; .750″; .900″ • available with grounding bracket
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, black color
- Contact material: Pin: brass gold-plated Socket: phosphor bronze gold-plated
- Current rating: 5 amps • Temperature rating: – 55° to + 125°C

K22/K44 SERIES
RIGHT ANGLE D-SUBMINIATURE



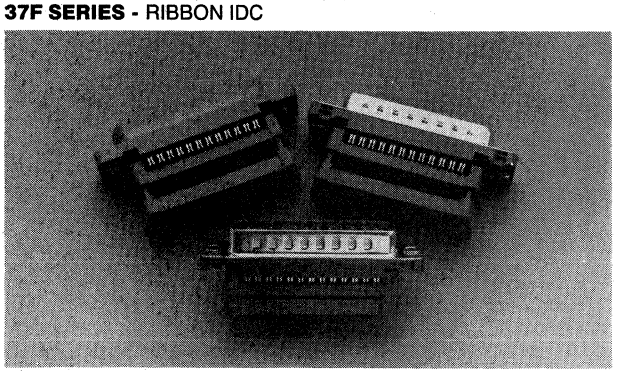
- Right angle termination, P.C. mount • .318 and .590 footprints
- Five shell sizes: 9, 15, 19, 25, 37
- Bright tin shells for exceptional conductivity and grounding
- Indentations (dimples) on plugs • 4-40 threaded inserts
- Many different mounting options available: grounding bracket, grounding strap, threaded mounting holes, non-threaded mounting holes
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, black color
- Contact material: Pin: brass gold-plated Socket: phosphor bronze gold-plated
- Current rating: 5 amps • Temperature rating: – 55° to + 125°C

K85/K88 SERIES
SOLDER CUP/VERTICAL P.C. MOUNT D-SUBMINIATURE



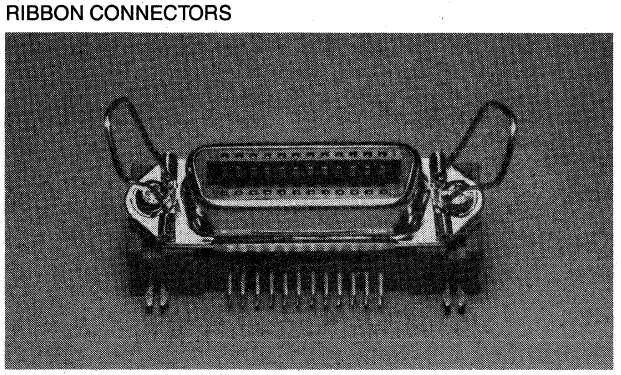
- Both high and low profile vertical P.C. mount
- Either precision formed or precision machined contacts
- Indentations (dimples) on plugs
- Five shell sizes: 9, 15, 19, 25, 37
- Available with 4-40 riveted threaded bushing
- Bright tin shells
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, black color
- Contact material: Pin: brass gold-plated Socket: phosphor bronze gold-plated
- Current rating: 5-8 amps
- Temperature rating: – 55° to + 125°C

K98/K99 SERIES - D-SUBMINIATURE IDC
37F SERIES - RIBBON IDC



- Metal and plastic insulation displacement connectors
- Wire accommodation: flat cable or discrete wire, 26 or 28 AWG, stranded or solid on 0.050″ centers
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated,
- Contact material: Pin: brass gold-plated Socket: phosphor bronze gold-plated
- Current rating: 5 amps
- Temperature rating: – 55° to + 125°C

37 SERIES
RIBBON CONNECTORS



- Right angle P.C. mount; solder cup; rack and panel; cable to panel; cable to cable; vertical P.C. mount types
- 4 Shell sizes: 14, 24, 36, 50
- Right angle P.C. mount available with grounding bracket
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, blue color
- Contact material: phosphor bronze gold-plated
- Current rating: 5 amps
- Temperature rating: – 55° to + 125°C

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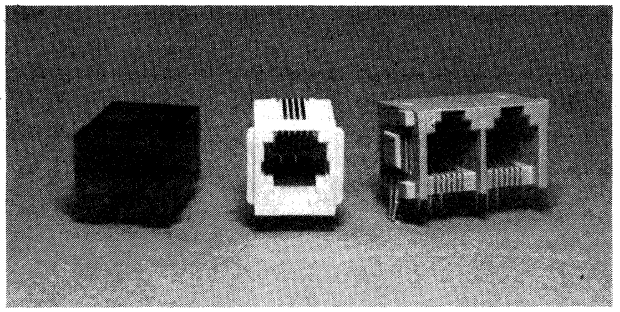
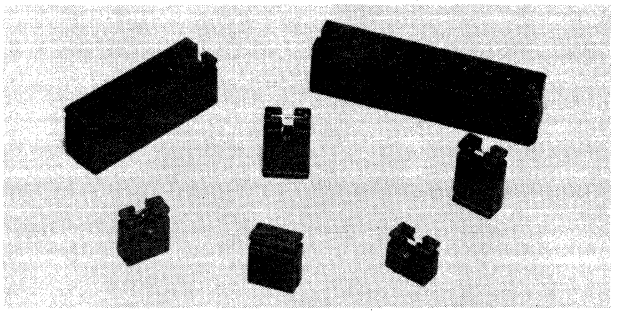
KYCON CABLE AND CONNECTOR, Inc.

MODULAR JACKS



- Handset; line; data; twin; low-profile
- Both right angle and perpendicular P.C. mount available
- Meets and exceeds FCC rules and regulations and REA PE-76
- Available in polarized and non-polarized versions
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated
- Contact material: phosphor bronze gold-plated
- Current rating: 1.5 amps

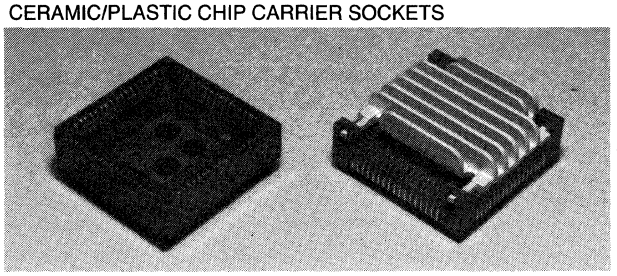
SHUNTS



- Mini: Micro; multiple position; either-end
- Double tuning fork-type contact guarantees high reliability
- 0.10″ pitch mates to 0.025″ square posts
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, black; other colors available
- Contact material: phosphor bronze gold-plated
- Current rating: 3-5 amps

LCC/PLCC SERIES

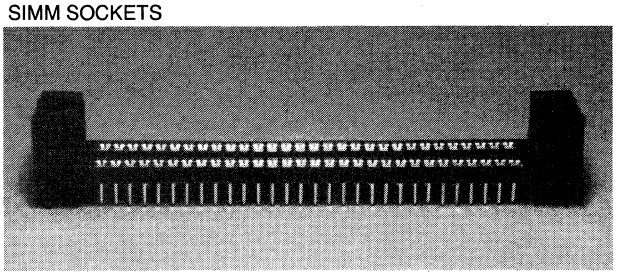
CERAMIC/PLASTIC CHIP CARRIER SOCKETS



- Low-profile construction
- Material: PLCC: phosphor bronze contacts; PBT or PPS body LCC: beryllium copper contacts gold-plated; PPS body; aluminum alloy heat sink
- Positions: PLCC: 44, 52, 68, 84 LCC: 68
- Closed bottom for protection from solder wicking into contact area
- Current rating: 1 amp
- Temperature rating: −55° to +125°C

KSS SERIES

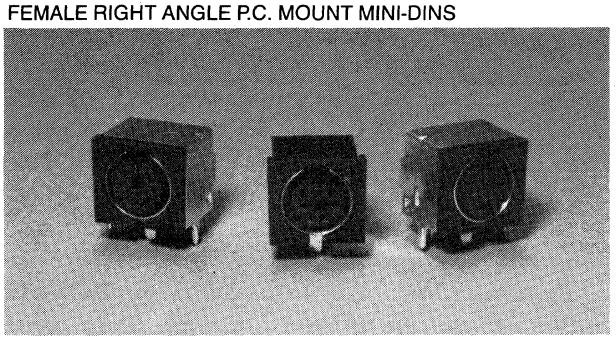
SIMM SOCKETS



- Single/dual row: Vertical/slanted: 30 position
- Closed bottom for protection from solder wicking into contact area
- Redundant leaf contacts
- Positive polarization of Simm Module
- 0.10″ Spacing
- PBT thermoplastic material, 30% glass-filled, UL 94V-0 rated, black color
- Contact material: phosphor bronze, tin or gold-plated
- Current Rating: 1 amp
- Temperature rating: −55° to +105°C

KMD SERIES

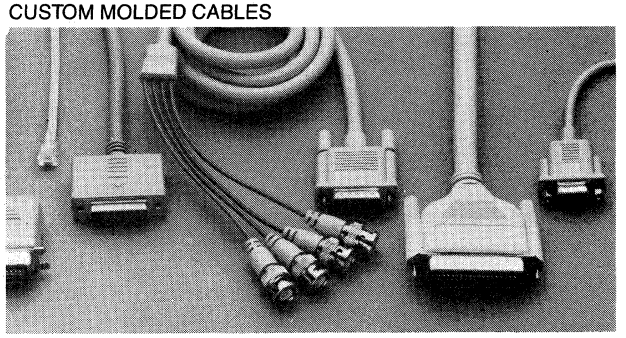
FEMALE RIGHT ANGLE P.C. MOUNT MINI-DINS



- Shielded and non-shielded
- 7 Positions: 3, 4, 5, 6, 7, 8, 9
- Closed bottom for protection from solder wicking into contact area
- PBT thermoplastic, UL 94V-0 rated, black color
- Contact material: phosphor bronze, silver or gold-plated
- Current rating: 1 amp

CABLES

CUSTOM MOLDED CABLES



- Completely custom molded cables built to exact customer specifications
- Engineering of cables to help reduce EMI/RFI electrical emissions
- Pre- and Post-mold 100% tested for mechanical and electrical specifications
- Specialized texturing and color matching
- Customized molds with company logos and part numbers
- Special packaging and labeling
- Drop-shipping worldwide

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SYMBOLS USED BY INTERNATIONAL REGULATORY AGENCIES

These symbols appear on many electrical/electronic components distributed in the world market. They indicate that a country's standard-setting agency has approved the design of the component and/or a testing agency has approved the performance of the component in meeting the standard. This page lists only those countries that have a *symbol* to represent their authority.

Argentina (IRAM) Instituto Argentino de Racionalization de Materiales

Australia (SAA) Standards Association of Australia

Austria (ÖVE) Öesterreichischer Verband für Elektrotechnik

Belgium (CEB) Comité Electrotechnique Belge

Brazil (ABNT) Associação Brasileira de Normas Teonicas

Canada (CSA) Canadian Standards Association

Czechoslovakia Urad pro Normalizaci a Mereni (Office for Standards and Measurements)

Denmark (DEK) Dansk Elektroteknisk Komite (Danish Electrotechnical Committee)

Egypt (EOS) Egyptian Organization for Standardization and Quality Control

Finland (SETI) Electrical Inspectorate

France (UTE) Union Technique de l'Électricité

Germany, Democratic Republic of (East) (ASMW) Amt für Standardi-sierung Messwesen und Warenprufung (Office for Standardization, Metrology and Quality Control)

Germany, Federal Republic of (West) (DKE) Deutsche Electrotechnische Kommission im DIN und VDE (German Electrotechnical Commission of DIN and VDE)

Greece (ELOT) The Hellenic Organization of Standardization

Hong Kong Hong Kong Standards & Testing Centre

Hungary (MSZH) Magyar Szabvanyugi Hivatal (Hungarian Office for Standardization)

India (ISI) Indian Standards Institute "Manak Bhavan"

Indonesia Badan Kerjasama Standardisasi LIPI-YDNI (LIPI-YDNI Joint Standardization Committee)

Iran Institute of Standards and Industrial Research of Iran

Ireland (IIRS) Institute for Industrial Research and Standards

Israel (SII) Standards Institution of Israel

Italy (CEI) Comitato Elettrotecnico Italiano (Italian Electrotechnical Committee)

Japan (JISC) Japanese Industrial Standards Committee Agency of Industrial Science and Technology

Korea, Republic of (South) Industrial Advance Administration

Mexico (DGN) Dirección General de Normas Secretaria de Patrimonio y Fomento Industrial Puente de Tecamachalco

Netherlands (NEC) Nederlands Elektrotechnisch Comite

New Zealand (SANZ) Standards Association of New Zealand

Norway (NEK) Norsk Elektroteknisk Komite (Norwegian Electrotechnical Committee)

Pakistan Pakistan Standards Institution

Poland Polski Komitet Normalizacji Miar i Jakosci (Polish Committee for Standardization, Measures and Quality Control)

Portugal (CEP) Comissão Electrotécnica Portuguesa

Romania Institutul Roman de Standardizare (Romanian Standards Institute)

Singapore Singapore Institute of Standards and Industrial Research

South Africa (SABS) South African Bureau of Standards

Spain (IRANOR) Instituto Nacional de Racionalización y Normalización

Sweden (SEK) Svenska Elektriska Kommissionen (Swedish Electrotechnical Commission)

Switzerland (SEV) Schweizerischer Elektrotechnischer Verein Postfach

Turkey (TSE) Turk Standardlari Enstitusu (Turkish Standards Institution)

United Kingdom (BSI) British Standards Institution

United States (ANSI) American National Standards Institute

United States (NEMA) National Electrical Manufacturers Association

Venezuela CODELECTRA en Conjunto con COVENIN Avda. Ppal.

Yugoslavia Federal Institute of Standardization

Connector Types

LEMO manufactures precision engineered cylindrical self-latching quick connect-disconnect electronic connectors for a wide variety of applications.

B SERIES: These connectors are mechanically keyed to protect contacts and insulators, and have very high contact density.
Range of contact configurations: Multi-contact: 2-64 contacts. Mixed: Combinations include coax, fiber optic, fluidic, pneumatic, and high voltage with signal contacts.
Range of cable outer diameter: .059″ to .984″/ 1.5 mm to 25.0 mm.

K SERIES: (environmental) These connectors are mechanically keyed and feature triple wall construction to provide water and dust resistance.
Range of contact configurations: Multi-contact and mixed: Identical to B series above.
Range of cable outer diameter: 0.028″ to .591″/ 0.7 mm to 15 mm.

S SERIES: LEMO's S Series features hermaphroditic inserts which assure proper contact alignment.
Range of contact configurations: Coax 50 and 75 ohm. Triax 50 and 75 ohm. Multi-contact: 2-106 contacts. Mixed: Wide variety of coax, high voltage and signal contacts.
Range of cable outer diameter: .039″ to 1.181″/ 1.0 mm to 30.0 mm.

E SERIES: (environmental) LEMO's E Series features hermaphroditic inserts and triple wall construction to provide water and dust resistance.
Range of contact configurations: Identical to S Series above.
Range of cable outer diameter: 0.028″ to 1.181″/ 0.7 mm to 30.0 mm.

SPECIAL COAXIAL SERIES: LEMO has developed a wide range of coaxial connectors to meet most applications.
01-MINAX Series: LEMO's smallest coaxial connector accommodates cable sizes RG.196A/U, RG.1788/U, and RG.174A/U.
OO-NIM (nuclear instrumentation module)—**CAMAC** (computer automated mesurement and control) Series: Designed for cables RG.174A/U, RG.188A/U, RG.316/U, RG.58/U, RG.178B/U and RG.196A/U.
OA-Telecommunications Series: Designed with contacts to accommodate telecommunications requirements. These accommodate cables RG.58C/U, RG.174A/U, RG.59B/U and RG.316/U.
Other coaxial connectors are available in Standard S-Series to accommodate cables up to .866″/ 22.0 mm.

VIDEO TRIAXIAL SERIES: LEMO's triaxial series is used mainly for video camera applications. LEMO has a number of standard connectors in this series and is in the forefront of developing new ones to meet clients' needs.

HIGH VOLTAGE SERIES: LEMO's High Voltage Series is designed for applications where there is a constant non-fluctuating flow of electricity and where power can be cut prior to connecting and disconnecting connector.
Range of contact configuration: 1-21 contacts.
Voltage capacity: Up to 50 kV.

P SERIES: (plastic) LEMO's plastic series is made of PSU (polysulfone), especially well suited for corrosive environments or where sterilization is needed.
Range of contacts: 6, 10 or 14 contacts plus one ground.
Range of cable outer diameter: .236″ to .354″/ 6-9 mm.

FIBER OPTIC: LEMO's fiber optic connectors are designed for multimode transmission on single or multi-fibers. Terminations are made by the cut and epoxy/polish method.
Fibers accommodated: 50, 100, 200 micron core fibers.

THERMOCOUPLE SERIES: LEMO's Thermocouple connectors are designed to assure continuous and accurate monitoring of hostile environments where extreme surface or ambient temperatures, gases or liquids must be controlled.

FLUIDIC/PNEUMATIC: LEMO's fluidic/pneumatic connectors are available in single or multiple tubes as well as mixed with electrical contacts.
Working pressure: Up to 10 bar (145 PSI).

HERMETICALLY SEALED RECEPTACLES: LEMO's sealed-through connectors are used in applications where moisture or some types of gas should be prevented from escaping from or to a closed circuit process and where connections and disconnections are necessary only for overhauling work.

The leakage rate of LEMO's sealed through connectors is 1×10^{-6} torr - 1/sec.

PRINTED CIRCUIT CONTACT CONNECTORS: LEMO has many connectors, coaxial and multi-contact in the B and S Series designed for printed circuit board mounting.

CABLE ASSEMBLY: LEMO offers quality cable assemblies to match their precision engineered connectors.

CUSTOM DESIGNS: For more information, please contact LEMO U.S.A., INC.

Thank you for considering LEMO Connectors—
The Quality Choice

LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 **800/444-LEMO (5366)**
(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

LEMO's Family of Connectors

Introduction for Connector Specifiers

There are 4 variables you should identify in specifying a connector:

1. Number of contacts
2. AWG
3. Voltage and current
4. Cable jacket outer diameter (for collet)

The tables on the following pages present this information concisely.

FIRST: Find the tables for the connector family which interests you.

SECOND: On the table selected, locate the size which accommodates the 4 variables noted above.

THIRD: Locate the outer shell configuration after the insert tables. Other configurations may be available for special applications.

PLEASE NOTE: If you do not see what you need please ask us. LEMO is constantly developing new products; therefore, all available connectors could not be included in this reference.

Connector Materials—

INSULATOR MATERIALS

Series	Valox	Peek	Teflon
B & K Series	X	X	N
S & E Series	X	X	X'
Coaxial & Triaxial Series	N	O	X
Video Triax	N	N	X
C Series	X	O	N
P Series	N	X	N
High Voltage	N	X	X

Codes: X – Standard
X' – Standard for Coaxial and Triaxial Connectors
O – Optional
N – Not Available

SHELL MATERIALS

Shells are constructed of precision machined brass with a hard satin chrome plated finish assuring rugged housing for maximum safety and uniform mating. Black, green or yellow chrome plating optional.

Optional materials include stainless steel or aluminum alloy (anodized in 6 colors: blue, yellow, black, red, green and transparent).

LEMO's lightweight Plastic Series of connectors are made of polysulfone PSU (MIL-P-461/20 MR). These connectors can be autoclaved.

Voltage Test Procedure—

PROCEDURE FOR DETERMINING TEST VOLTAGES AND WORKING VOLTAGES FOR LEMO CONNECTORS:

Test Voltage: Test voltages are determined by taking an average of the points at which arcing occurred and reducing it by 1/3.

Working Voltage: Working voltages are determined by taking test voltages and reducing them further by 2/3.

For high-voltage connectors, IEC publication 130-1 § 14.5 b) applies:

$$\text{Working voltage} = \frac{\text{Test voltage}}{1{,}5}$$

LEMO guarantees the proper functioning of the connector at working voltages.

Although this may appear quite conservative, it is in keeping with LEMO's insistence on assuring proper functioning and maintenance of high-quality standards.

Current ratings noted are per contact.

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B & K Series Inserts

MULTI-CONTACT INSERTS

Number of Contacts	Contact Types Available	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2	S	30	350	500	4	00
3	S	30	350	500	3	
Maximum Collet Range 3 MM. (.12 In.)						
2	C S P	22	460	660	10	0
3	C S P	22	420	600	8	
4	C S P	26	460	660	7	
5	C S P	26	260	400	6.5	
7	S P	30	220	320	2.5	
Collet Range 1.5 - 5.5 MM. (.059 - .217 In.)						
2	C S P	20	530	760	15	1
3	C S P	20	420	600	12	
4	C S P	22	630	900	10	
5	C S P	22	460	660	9	
6	C S P	26	460	660	7	
7	C S P	26	460	660	7	
Collet Range 2.0 - 7.5 MM. (.079 - .295 In.)						
2	C S	16	700	1000	30	2
3	C S	18	560	830	17	
4	C S P	20	1000	1300	15	
5	C S P	20	860	1200	14	
6	C S P	20	630	900	12	
7	C S P	20	500	730	11	
8	C S P	22	1000	1500	10	
10	C S P	22	560	830	8	
12	C S P	26	560	830	7	
14	C S P	26	560	830	6.5	
16	C S P	26	500	730	6	
18	C S P	26	460	660	5.5	
19	C S P	26	460	660	5	
Collet Range 1.5 - 9.7 MM. (.059 - .382 In.)						
2	S	12	760	1100	50	3
3	C S	16	1200	1600	25	
4	C S	16	830	1100	22	
5	C S	18	860	1200	19	
6	C S	18	730	1000	17	

MULTI-CONTACT INSERTS

Number of Contacts	Contact Types Available	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
7	C S	18	730	1000	15	3
8	C S P	20	700	1000	13	
10	C S P	20	460	660	12	
12	C S P	22	560	830	9	
14	C S P	22	560	830	9	
16	C S P	22	460	660	8	
18	C S P	22	460	660	7	
20	C S P	26	500	730	6	
22	C S P	26	400	560	5.5	
24	C S P	26	400	560	5	
26	C S P	26	260	400	4.5	
28	C S P	26	260	400	4	
30	C S P	26	260	400	3.5	
Collet Range 4.1 - 11.7 MM. (.161 - .461 In.)						
4	C S	12	930	1300	30	4
6	C S	16	930	1300	24	
10	C S	18	700	1000	17	
12	C S	20	1000	1400	12	
16	C S	22	1000	1400	10	
20	C S	22	700	1000	8	
24	C S	22	630	900	7	
30	C S	22	460	660	5	
40	C S	26	560	800	2	
Collet Range 5.1 - 16.0 MM. (.201 - .630 In.)						
4	C S	10	2500	3500	25	5
10	C S	12	1200	1800	20	
14	C S	16	1500	2100	18	
16	C S	16	1500	2100	12	
20	C S	18	1300	1800	10	
30	C S	20	1200	1700	8	
40	C S	20	760	1100	7	
48	C S	20	630	900	6	
54	C S	22	760	1100	5	
64	C S	22	530	700	3	
Collet Range 11.6 - 25.0 MM. (.457 - .984 In.)						

Contact types: C = crimp contact S = solder contact
P = printed circuit contact

Wire sizes in this table are valid for solder-type contacts (standard version). AWG may vary depending on wire type (solid or stranded).

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B & K Series Inserts

Mixed Contact Connectors

MIXED CONTACT INSERTS

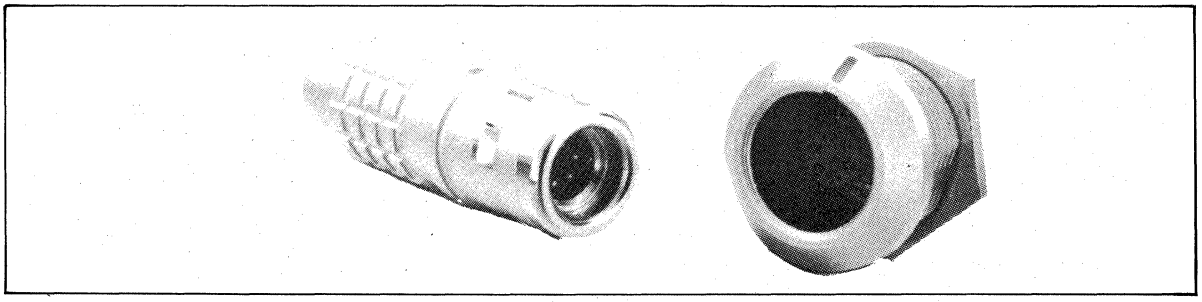
Number of Contacts	Contact Types Available	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 coax 50 ohms 2 multi	S C S	26 22	300 330	480 500	5 8	2
1 coax 50 ohms 4 multi	S C S	26 26	300 400	480 600	5 5	
1 coax 50 ohms 6 multi	S C S	26 26	300 400	480 600	5 5	
Collet Range 1.5 - 9.7 MM. (.059 - .382 In.)						
1 coax 50 ohms 6 multi	S C S	26 26	300 400	480 600	5 5	3
1 coax 50 ohms 9 multi	S C S	26 26	300 400	480 600	5 5	
1 coax 50 ohms 12 multi	S C S	26 22	300 400	480 600	5 5	
1 coax 50 ohms 13 multi	S C S	26 26	300 400	480 600	5 5	
2 coax 50 ohms 4 multi	C C S	26 22	500 400	730 600	2 8	
2 coax 50 ohms 10 multi	C C S	26 26	500 200	730 280	2 5	
1 HV 18 multi	S C S	22 26	2000 400	3000 600	6 5.5	
Collet Range 4.1 - 11.7 MM. (.161 - 4.61 In.)						
1 coax 50 ohms OR 75 ohms 2 multi	S S C S	18 20 22	600 800 400	900 1100 600	12 7 8	4
1 coax 50 ohms OR 75 ohms 4 multi	S S C S	18 20 22	600 800 400	900 1100 600	12 7 7	
1 coax 50 ohms OR 75 ohms 6 multi	S S C S	18 20 22	600 800 400	900 1100 600	12 7 5	
2 coax 50 ohms 2 multi	S C S	26 22	300 400	480 600	5 8	

MIXED CONTACT INSERTS

Number of Contacts	Contact Types Available	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2 coax 50 ohms 4 multi	S C S	26 22	300 400	480 600	5 7	4
2 coax 50 ohms 12 multi	C C S	26 22	500 400	700 600	2 4	
2 coax 50 ohms 16 multi	C C S	26 22	500 400	700 600	2 4	
2 coax 50 ohms 18 multi	C C S	26 26	500 500	700 700	2 2	
3 coax 50 ohms 12 multi	C C S	26 26	500 300	700 500	2 2	
4 coax	C	24	300	500	2	
Collet Range 5.1 - 16.0 MM. (.201 - .630 In.)						
2 coax 50 ohms OR 75 ohms 10 multi	C C C S	20 22 22	280 700 500	460 1000 700	11 6 8	5
2 coax 50 ohms OR 75 ohms 16 multi	C C C S	20 22 22	280 700 500	460 1000 700	11 6 8	
2 coax 50 ohms OR 75 ohms 17 multi	C C C S	20 22 14,22	280 700 500	460 1000 700	11 6 30/8	
10 coax	C	24	300	500	2	
1 triax 75 ohms 32 multi	S C S	22 20	800 500	1100 700	7 8	
Collet Range 11.6 - 25.0 MM. (.457 - .984 In.)						

Many new mixed contact configurations are available. Please call for information.

K SERIES: Environmentally sealed and keyed connectors. Insert configurations available are identical to B Series sizes 0 through 5. Cable collet range for cable O/D is the same as E Series, sizes 0 through 5 (on pages 24-29).



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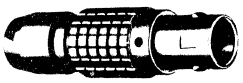
Shells

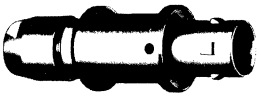
B Series Shells—

Shell Configurations for Multi- and Mixed Contact Connectors

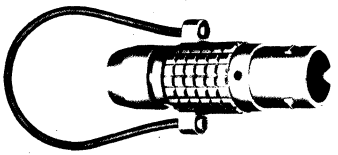
PLUGS



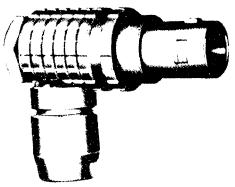
FGG, FG (A...L)
Straight Plug



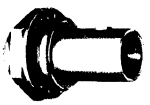
FZG, FZ (A...L)
Straight Plug
(Robotics)



FNG, FN (A...L)
Straight Plug
(with Lanyard)

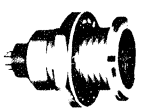


FHG, FH (A...L)
Elbow Plug

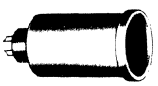


FAG Fixed Plug
(non-latching)

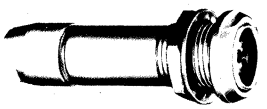
RECEPTACLES



EGG, EG (A...L)
Fixed Receptacle

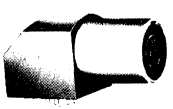


EJG Fixed Receptacle
(Force Fit)

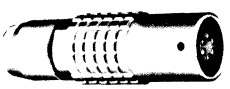


PFG, PF (A...L)
Fixed Receptacle
(Cable Terminated–
Mount From Rear)

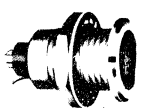
EEG, EE (A...L)
Fixed Receptacle
(Mount From Rear)



EPG Fixed Receptacle
(PC Board Mount)

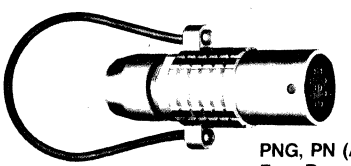


PHG, PH (A...L)
Free Receptacle

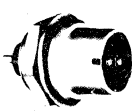


ENG, EN (A...L)
Fixed Receptacle
(with Grounding Tab)

PKG, K (A...L)
Fixed Receptacle
(Cable Terminated)



PNG, PN (A...L)
Free Receptacle
(with Lanyard)



EHG, EH (A...L)
Fixed Receptacle
(Raised)

K Series Shells—

Shell Configurations for Single, Coaxial, Triaxial, Multi- and Mixed Contact Connectors

EGG Panel Mount
Receptacle

RECEPTACLES

PLUG

FGG
Plug

PKG Panel Mount
Cable Terminated
Receptacle

PHG Cable
Receptacle

LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 800/444-LEMO (5366)
(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

S Series Inserts Multi-Contact Connectors

MULTI-CONTACT INSERTS

Solder-type contacts are standard. Printed circuit contacts may be available upon request.

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2	24	500	700	10	0
3,4	26	300	500	7	
Collet Range 1.7 - 4.2 MM. (.066 - .165 In.)					
2	20	400	600	12	1
3,4	24	400	600	10	
5,6	26	500	700	7	
Collet Range 1.7 - 6.2 MM. (.066 - .244 In.)					
2	18	600	900	20	2
3,4,5,6	20	500	700	15-12	
3	20	300	400	12	
4	24	300	400	9	
8,10	24	300	400	9,7	
Collet Range 2.7 - 8.5 MM. (.106 - .334 In.)					
2,3	14	1000	1400	23,20	3
4	14	500	700	18	
2	14	500	700	18	
3	20	500	700	14	
6	20	700	1000	14	
7,8,10	20	300	500	12-9	
12,13,14	24	400	600	8-7	
16	24	300	500	7	
18	24	300	400	6	
Collet Range 3.7 - 10.7 MM. (.145 - .421 In.)					
2	8	700	1000	35	4
3	12	700	1000	25	
4	12	700	1000	22	
2	12	700	1000	22	
3	14	700	1000	16	
6	14	700	1000	16	
3	14	700	1000	16	
4	20	700	1000	13	
8	20	900	1300	13	
9,10,12,13,14	20	700	1000	12-7	
16,18,20 22,24	24	700	1000	7	
Collet Range 5.2 - 13.2 MM. (.204 - .519 In.)					

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2	5	1100	1600	50	5
1	5	1100	1600	50	
2	8	1100	1600	35	
4	8	1100	1600	35	
2	8	1000	1500	35	
3	12	1000	1500	25	
6	12	1000	1400	25	
8	12	800	1100	22	
10,12	14	700	1000	18	
2	12	700	1000	20	
12	14	700	1000	15	
16	14	700	1000	15	
2	12	600	800	18	
16	18	600	800	11	
20	18	600	800	11	
2	12	600	800	16	
20	18	600	800	9	
24	18	700	1100	9	
30,36	20	600	800	8,7	
40,44,48	20	400	600	7,6,6	
Collet Range 8.2 - 22.2 MM. (.539 - .874 In.)					
4	4	1000	1400	60	6
12	7	700	1000	22	
18	8	400	600	16	
20	12	500	700	14	
24	12	400	600	12	
30	12	700	1100	10	
48	20	500	700	7	
60	14	500	700	5	
64	20	700	1000	4	
72	20	300	500	4	
106	24	250	400	2	
Collet Range 12.2 - 30.2 MM. (.480 - 1.188 In.)					

MIXED CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 HV	20	2000	3000	6	3
2 multi	14	500	700	18	
1 HV	20	2000	3000	6	
4 multi	20	350	500	10	
1 HV	20	2000	3000	6	
5 multi	20	350	500	9	
1 HV	20	2000	3000	6	
6 multi	20	350	500	8	
1 HV	20	2000	3000	6	
7 multi	20	350	500	7	
1 HV	20	2000	3000	6	
8 multi	24	300	500	7	
2 HV	20	2000	3000	6	
2 multi	20	500	700	18	
2 HV	20	2000	3000	6	
4 multi	20	300	500	10	
2 HV	20	2000	3000	6	

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 coax 00 50 ohms 1 multi	26 20	300 900	500 1300	5 14	3
1 coax 00 50 ohms 2 multi	26 20	300 400	500 600	5 14	
1 coax 00 50 ohms 3 multi	26 20	300 900	500 1300	5 14	
1 coax 00 50 ohms 4 multi	26 20	300 400	500 600	5 10	
1 coax 00 50 ohms 5 multi	26 24	300 600	500 800	5 8	
Collet Range 3.7 - 10.7 MM. (.145 - .421 In.)					

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S Series Inserts/Shells Mixed Contact Connectors

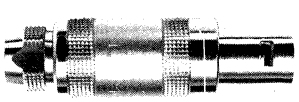
MIXED CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 HV 2 multi	14 12	2000 700	3000 1000	8 21	4
1 HV 6 multi	14 20	2000 700	3000 1000	8 9	
1 HV 12 multi	14 24	2000 700	3000 1000	8 7	
2 HV 5 multi	14 20	2000 700	3000 1000	8 11	
2 HV 7 multi	14 20	2000 700	3000 1000	8 8	
2 HV 9 multi	14 24	2000 700	3000 1000	8 7	
2 HV 10 multi	14 24	2000 700	3000 1000	8 7	
2 HV	14	2000	3000	8	
3 HV	14	2000	3000	8	
4 HV	14	2000	3000	8	
1 coax 00 50 ohms 6 multi	26 20	300 700	500 1000	5 9	
1 coax 00 50 ohms 9 multi	26 24	300 700	500 1000	5 7	
1 coax 00 50 ohms 12 multi	26 24	300 700	500 1000	5 7	
2 coax 00 50 ohms 4 multi	26 20	300 700	500 1000	5 13	
2 coax 00 50 ohms 12 multi	26 24	300 600	500 800	5 7	
Collet Range 5.2 - 13.2 MM. (.204 - .519 In.)					
1 HV 8 multi	14 14	3400 400	5000 600	6 14	5

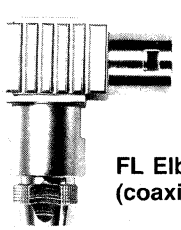
Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2 HV 4 multi	14 12	3400 700	5000 1000	6 22	5
2 HV 8 multi	14 14	3400 700	5000 1000	6 15	
2 HV 24 multi	14 20	3400 400	5000 600	6 6	
1 HV 10 multi	12 14	6800 400	10000 600	8 15	
4 HV	14	3400	5000	6	
8 HV	14	2000	3000	5	
2 coax 0 50 ohms 8 multi	24 20	1000 600	1500 800	7 12	
2 coax 0 50 ohms 12 multi	24 20	1000 600	1500 800	7 9	
2 coax 0 50 ohms 20 multi	24 20	1000 250	1500 400	7 7	
2 coax 0 50 ohms 24 multi	24 20	1000 250	1500 400	7 6	
Collet Range 8.2 - 22.2 MM. (.322 - .874 In.)					
4 coax 1 75 ohms	20	600	800	12	6
3 coax 0 50 ohms 26 multi	24 14	1000 500	1500 700	7 5	
8 coax 00 50 ohms 20 multi	26 18	400 500	600 700	5 7	
3 coax 1 75 ohms 26 multi	20 20	600 400	700 600	12 4	
Collet Range 12.2 - 30.2 MM. (.480 - 1.188 In.)					

Shells Shell Configurations for Single, Coaxial, Triaxial, Multi- and Mixed Contact Connectors

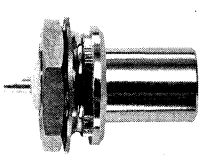
PLUGS



F Straight Plug

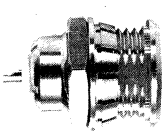


FL Elbow Plug (coaxial only)

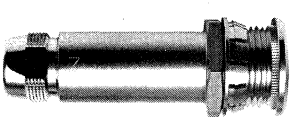


FA Straight Plug Non-Latching

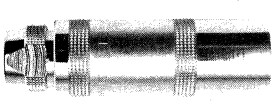
RECEPTACLES



RA Straight Receptacle



RASC Straight Receptacle



RC Straight Receptacle

LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 800/444-LEMO (5366)
(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

E Series Inserts

Environmentally Sealed Single, Coaxial, Triaxial, Multi-Contact Connectors

SINGLE CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage	Rated Current	Shell Size
1	18	500	12	0
Collet Range 1.2 - 5.2 MM. (.047 - .204 In.)				
1	14	500	18	1
1	12	500	25	
Collet Range 1.7 - 6.7 MM. (.066 - .263 In.)				
1	12	1000	30	2
1	10	700	40	
Collet Range 2.2 - 8.5 MM. (.086 - .334 In.)				
1	10	1000	43	3
1	8	700	65	
Collet Range 3.2 - 10.5 MM. (.125 - .413 In.)				

COAXIAL INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 50 ohms	24	1000	1400	6	0
Collet Range 1.2 - 5.2 MM. (.047 - .204 In.)					
1 50 ohms	18	1000	1400	12	1
1 75 ohms	20	800	1200	10	
Collet Range 1.7 - 6.7 MM. (.066 - .263 In.)					
1 50 ohms	14	1000	1400	15	2
1 75 ohms	18	500	700	12	
Collet Range 2.2 - 8.5 MM. (.086 - .334 In.)					
1 50 ohms	12	1000	1400	26	3
1 75 ohms	14	900	1300	15	
Collet Range 3.2 - 10.5 MM. (.125 - .413 In.)					
1 50 ohms	10	700	1000	36	4
1 75 ohms	12	600	900	26	
Collet Range 5.2 - 14.2 MM. (.204 - .559 In.)					

TRIAXIAL INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 50 ohms	24	350	500	6	0
Collet Range 1.2 - 5.2 MM. (.047 - .204 In.)					
1 50 ohms	24	350	500	6	1
Collet Range 1.7 - 6.7 MM. (.066 - .263 In.)					
1 50 ohms	18	500	700	12	2
1 75 ohms	24	500	700	6	
Collet Range 2.2 - 8.5 MM. (.086 - .334 In.)					
1 50 ohms	14	800	1200	15	3
Collet Range 3.2 - 10.5 MM. (.125 - .413 In.)					
1 50 ohms	12	900	1300	26	4
1 75 ohms	16	1000	1400	15	
Collet Range 5.2 - 14.2 MM. (.204 - .559 In.)					

MULTI-CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2	24	500	700	10	0
3,4	26	300	500	7	
Collet Range 1.2 - 5.2 MM. (.047 - .204 In.)					
2	20	400	600	12	1
3,4	24	400	600	11,10	

MULTI-CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
5,6	26	500	700	8,7	1
Collet Range 1.7 - 6.7 MM. (.066 - .263 In.)					
2	18	600	900	20	2
3,4,5,6	20	500	700	17-11	
3 4	20 24	300 300	400 400	10 8	
8,10	24	300	400	9,8	
Collet Range 2.2 - 8.5 MM. (.086 - .334 In.)					
2,3	14	1000	1400	23,20	3
4	14	500	700	18	
2 3	14 20	500 500	700 700	16 9	
6	20	700	1000	14	
7,8,10	20	300	500	12,10,9	
12,14	24	400	600	8,7	
16,18	24	300	400	7,6	
Collet Range 3.2 - 10.5 MM. (.125 - .413 In.)					
2	8	700	1000	28	4
1 2	8 12	700 700	1000 1000	24 18	
4	12	700	1000	21	
2 3	12 14	700 700	1000 1000	18 14	
6	14	700	1000	16	
3 4	14 20	700 700	1000 1000	14 8	
8	20	900	1300	13	
9,10,12,14	20	700	1000	12-8	
16,18,20, 22	24	700	1000	7	
24	24	700	2000	7	
Collet Range 5.2 - 14.2 MM. (.204 - .559 In.)					
2	5	1200	1800	35	5
1 2	5 8	1200 1200	1600 1600	33 30	
4	8	1200	1800	30	
6	12	1000	1400	27	
8	12	800	1100	23	
10,12	14	700	1000	20,18	
2 12	12 14	700 700	1000 1000	23 18	
2 16	12 18	600 600	800 800	12 9	
20	18	600	800	11	
2 20	12 18	600 600	800 800	10 9	
24	18	700	1100	9	
30,36	20	600	800	8,7	
44,48	20	400	600	6	
Collet Range 10.2 - 22.2 MM. (.401 - .874 In.)					
12	7	700	1000	22	6
24	12	400	600	12	
30	12	700	1100	10	
48	20	500	700	7	
60	14	500	700	5	
64	20	700	1000	4	
72	20	300	500	4	
106	24	300	400	2	
Collet Range 15.2 - 27.2 MM. (.598 - 1.070 In.)					

NOTE: Other mixed inserts are available.

LEMO USA INC
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(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

E Series Inserts / Shells

E Series Inserts Mixed Contact Connectors

MIXED CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1HV	20	2000	3000	6	3
5 multi	20	300	500	9	
1 HV	20	2000	3000	6	
6 multi	20	400	600	8	
1 HV	20	2000	3000	6	
8 multi	24	300	500	7	
2 HV	20	2000	3000	6	
4 multi	20	300	500	10	
1 coax 00 50 ohms	26	400	500	1	
5 multi	24	300	500	9	
Collet Range 3.2 - 10.5 MM. (.125 - .413 In.)					
1 HV	14	2000	3000	8	4
3 multi	14	700	1000	16	
1 HV	14	2000	3000	8	
10 multi	24	700	1000	7	
2 HV	14	2000	3000	8	
5 multi	20	700	1000	11	
2 HV	14	2000	3000	8	
12 multi	24	700	1000	7	
1 coax 00 50 ohms	26	400	500	1	
6 multi	20	700	1000	9	
1 coax 00 50 ohms	26	400	500	1	
12 multi	24	700	1000	7	
2 coax 00 50 ohms	26	400	500	1	
4 multi	20	900	1300	13	
Collet Range 5.2 - 14.2 MM. (.204 - .559 In.)					

MIXED CONTACT INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
2 HV	14	3400	5000	6	5
8 multi	14	700	1000	14	
8 HV	14	2000	3000	5	
2 coax 0 50 ohms	24	600	800	2	
12 multi	20	700	1100	9	
2 coax 0 50 ohms	24	600	800	2	
24 multi	20	400	600	6	
1 coax 1 75 ohms	18	1000	1500	8	
3 multi	12	800	1000	20	
Collet Range 10.2 - 22.2 MM. (.401 - .874 In.)					
3 coax 0 50 ohms	24	600	800	2	6
26 multi	14	500	700	5	
2 coax 1 75 ohms	20	1000	1500	8	
26 multi	14	500	700	5	
4 coax 00 50 ohms	20	500	700	4	
20 multi	20	500	700	5	
8 coax 00 50 ohms	26	400	600	5	
20 multi	18	500	700	7	
3 coax 1 75 ohms	20	500	700	4	
26 multi	20	500	700	5	
6 coax 00 50 ohms	26	400	600	5	
30 multi	20	400	600	5	
Collet Range 14.2 - 30.2 MM. (.559 - 1.188 In.)					

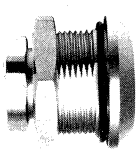
E Series Shells

Environmentally Sealed Single, Coaxial, Triaxial, Multi-Contact Connectors

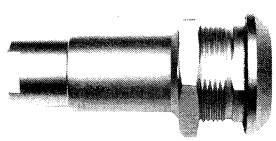
PLUG

FE Plug

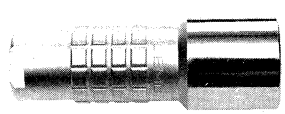
RECEPTACLES



RAE Panel Mount Receptacle



RASCE Panel Mount Cable Terminated Receptacle



RCE Cable Receptacle

LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 **800/444-LEMO (5366)**
(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

Coaxial & Triaxial Connectors

S Series Coaxial & Triaxial Connectors

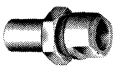
MINAX – 01 SERIES 50 Ohms – Coaxial

Range of Contacts: Coaxial 50Ω
Electrical Properties:
Impedance: 50 ohms ± 4% Operating Current: 3 amps.
VSWR: 1,16 @ 1 GHz
Insulator Resistance: $>10^{12}$ Ω
Contact Resistance: <3m Ω
Test Voltage: 1200 VDC
Mechanical Properties:
Coupling: Quick connect/disconnect self-locking snap-latch.
Shells: Brass, plated .000120 gold over .000240 nickel.
Contact: Phosphor bronze, plated .000120 gold over .000020 chromium over .000120 nickel.
Operating Temperature: −60°C to +120°C
Insulator: Nylatron
Panel Thickness: 1/16" nominal.
Recommended Cables: RG.196A/U, RG.178B/U, RG.174A/U

PLUG

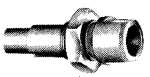
FS.01.250 Cable Plug

RECEPTACLES

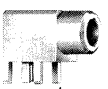


RA.01.250 Receptacle

RP.01.250 - Straight Receptacle for Printed Circuit



RASC.01.250 Receptacle



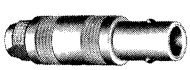
RPL.01.250 - Right Angle Receptacle for Printed Circuit

RC.01.250 Cable Receptacle

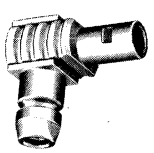
NIMCAMC — 00 SERIES 50 Ohms — Coaxial

Range of Contacts: Coaxial 50Ω
Electrical Properties:
Impedance: 50 ohms ± 2%
Frequency: over 1 GHz
Working Voltage: 1000 VDC
Test Voltage: 3000 VDC
Mechanical Properties:
Outer Shell: Brass 59A
Insulator: Teflon
Contacts: Brass with high modulus of elasticity. Low and constant resistance. With copper flash, 3 microns nickel, 1.5 microns gold
Working Temperature: −250°C +260°C (−410°F +500°F)
Contact Resistance: <8mΩ
Insulator Resistance: $>10^{12}$Ω
Recommended Cables: RG.174A/U, RG.188A/U, RG.316/U, RG.58C/U, RG. 178 B/U, RG.187A/U, RG.196A/U

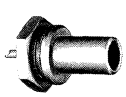
PLUGS



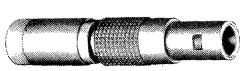
F Straight Plug



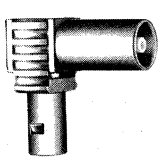
FL Right Angle Plug



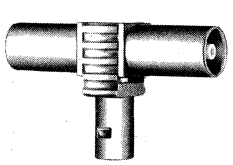
FA Panel Mounting Plug



FRT Plug with Resistor

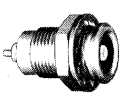


FR Right Angle Plug with Receptacle



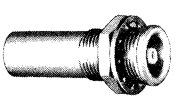
FT T-Piece

RECEPTACLES

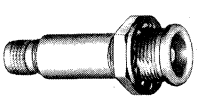


RA Receptacle

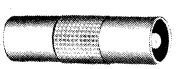
RAW Sealed Receptacle



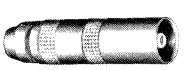
RAD Double Receptacle



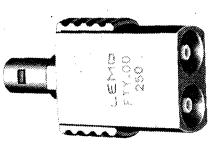
RASC Receptacle with Cable Collet



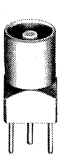
RM Free Double Receptacle



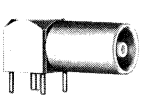
RC Free Receptacle



FY Twin Receptacle with Male Exit



RP Receptacle for Printed Circuit



RPL Right Angle Receptacle for Printed Circuit

LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 800/444-LEMO (5366)
(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

Coaxial & Triaxial Connectors/Shells

OA SERIES - 50 AND 75 OHM

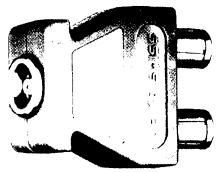
Range of Contacts: Coaxial 50Ω or 75Ω

Electrical Properties:
Impedance: 50 or 75 ohms
Frequency: 850 MHz (50 ohm) 3.4 GHz (75 ohm)
VSWR: 1.03 + 0.2f (50 ohm) 1.03 + 0.5f (75 ohm)
Insulator Resistance: $>10^{12}$ Ω
Contact Resistance: <4.5Ω

Recommended Cables: RG.174A/U (50 ohm), RG.58C/U (50 ohm), RG316/U (50 ohm), RG.59B/U (75 ohm), Siemens 2YCY(0.4/2.5), Siemens 2YCCY(0.4/2.5), Daetwyler HF 2106, Daetwyler HF 5408/1, GORE CXN-1586, NE-728A

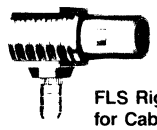
PLUGS

F Straight Plug with Collet



CAVR Bridge Plug

FS Straight Plug with Backnut for Cable Crimping

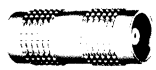


FLS Right Angle Plug for Cable Crimping

RECEPTACLES

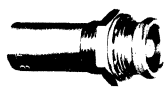
RA Standard Receptacle

RASCS Receptacle with Backnut for Cable Crimping

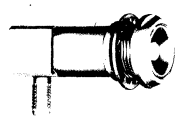


RM Double Free Receptacle

RCS Free Receptacle



RAD Double Receptacle



PLK Right Angle Receptacle

STANDARD SERIES COAXIAL INSERTS

Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 50 ohms	24	1000	1400	6	0
Collet Range 1.7 - 4.2 MM. (.066 - .165 In.)					
1 50 ohms	18	1000	1400	12	1
1 75 ohms	20	800	1200	10	
Collet Range 1.7 - 6.2 MM. (.066 - .244 In.)					
1 50 ohms	14	1000	1400	15	2
1 75 ohms	18	500	700	12	
Collet Range 2.7 - 8.5 MM. (.106 - .334 In.)					
1 50 ohms	12	1000	1400	26	3
1 75 ohms	14	900	1300	15	
Collet Range 3.7 - 10.7 MM. (.145 - .421 In.)					
1 50 ohms	8	700	1100	36	4
1 75 ohms	12	600	900	26	
Collet Range 5.2 - 13.2 MM. (.204 - .519 In.)					
1 50 ohms	10	1000	1400	45	5
Collet Range 8.2 - 22.2 MM. (.322 - .874 In.)					

STANDARD SERIES TRIAXIAL INSERTS

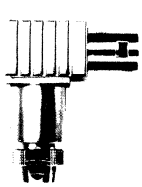
Number of Contacts	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 50 ohms	24	350	500	6	0
Collet Range 1.7 - 4.2 MM. (.066 - .165 In.)					
1 50 ohms	24	350	500	6	1
Collet Range 1.7 - 6.2 MM. (.066 - .244 In.)					
1 50 ohms	18	500	700	12	2
1 75 ohms	24	500	700	6	
Collet Range 2.7 - 8.5 MM. (.106 - .334 In.)					
1 50 ohms	14	800	1200	15	3
Collet Range 3.7 - 10.7 MM. (.145 - .421 In.)					
1 50 ohms	12	900	1300	26	4
Collet Range 5.2 - 13.2 MM. (.204 - .519 In.)					

Shells

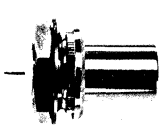
S Series Connectors

PLUGS

F Straight Plug with Cable Collet

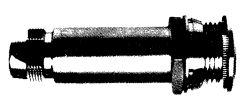


FL Elbow Plug (90°) with Cable Collet
- only available in coaxial

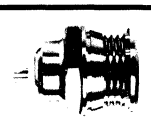


FA Straight Plug Non-Latching

RECEPTACLES



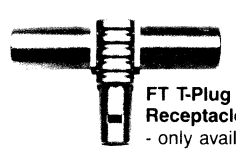
RASC Straight Receptacle with Cable Collet



RA Straight Receptacle

RM Straight Coupler with Two Receptacles
- only available in coaxial

RAD Straight Coupler with Two Receptacles
- only available in coaxial



FT T-Plug with Two Receptacles In Line
- only available in coaxial

RC Straight Receptacle with Cable Collet

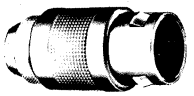
LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 800/444-LEMO (5366)
(707) 578-8811 , Telex 340-933, Telefax (707) 578-0869

C Series—Short Type Connectors

LEMO's Short Series of connectors are ideal for applications where space limitation does not allow the use of a normal-size connector. 2C Series connectors do not mate with standard S Series connectors nor with E Series environmentally sealed connectors. Contact types are available in solder only.

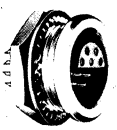
Number of Contacts	Contact Types Available	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
1 Coax 50Ω	S	20	700	1000	10	2C
2	S	18	600	800	20	
3	S	20	500	700	15	
4	S	20	500	700	15	
6	S	20	500	700	12	
8	S	24	500	700	7	
10	S	24	500	700	7	
12	S	24	200	300	5	
14	S	24	200	300	5	
18	S	24	200	300	5.5	

PLUGS

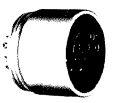


Fc
Plug

RECEPTACLES

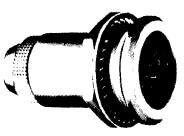


RAc
Receptacle

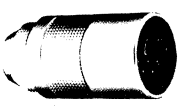


RVc Protruding Receptacle Screwed On Panel

For RVc the threading in the panel must be M13 x 0.75



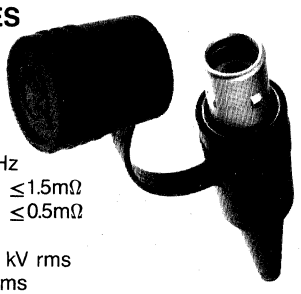
RASCc Receptacle With Cable Collet



RCc
Free Receptacle

Video Triax Connectors Triaxial Connectors

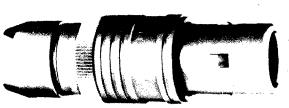
VIDEO 4A (American) SERIES



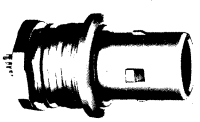
TECHNICAL CHARACTERISTICS:

Nominal impedance: 75 ohms
Operating frequency: 2.5 GHz
VSWR: 1.01 + 0.076f[GHz]
Insertion loss: < .001 dB at 100 MHz
Contact resistance: center contacts ≤1.5mΩ
internal ground ≤0.5mΩ
Breakdown voltage:
center contact/internal ground: 4 kV rms
internal/external ground: 9.5 kV rms
Operating temperatures: −50°C + 260°C (−58°F + 500°F)
Connector retention force, engaged: min. 28N
Cable retention force: min. 500N
Recommended cables:
BIW: 10069-C-G20, 10070-C-G14
Belden: 8232, 8233, 9232, 9267
Felten & Guillaume: 12765700, 12766400, 1276601 and 12766700
Datwyler: HF2426
Fujikura: 4.6/1.0EFTX

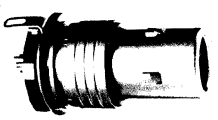
PLUGS



F4Z675TB
Straight Plug with Cable Collet and Safety Ring



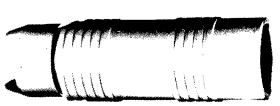
FA4Z675TC111
Straight Plug with Nut Fixing and Round Flange



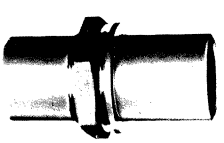
FAG4Z675TC110
Straight Plug with Nut Fixing

RECEPTACLES

RA4Z675TC
Fixed Receptacles with Nut Fixing and Visible Shell



RC4Z675TB
Free Receptacles with Cable Collet



RAD4Z675TC
Fixed Coupler with Visible Shell

RM4Z675TC
Straight Coupler

LEMO USA INC
P.O. Box 11488, Santa Rosa, CA 95406 800/444-LEMO (5366)
(707) 578-8811, Telex 340-933, Telefax (707) 578-0869

P Series Plastic Multi-Contact Connectors

TECHNICAL CHARACTERISTICS

Electrical Properties

Number of Contacts	Contact Types Available	Wire Max AWG	Working Voltage AC	Working Voltage DC	Rated Current	Shell Size
6	C S PC	22	900	1300	6	3P
10	C S PC	22	800	1100	5	
14	C S PC	22	400	600	4	
18	C S	24	400	600	3	
Mixed						
9	C S	22	400	600	4	
1 HV	S	22	3400	5000	4	

Contacts/screen insulating resistance > 10^{12} Ohms per MIL Std. 1344A meth. 3003.1; IEC-130-1 § 14.4a

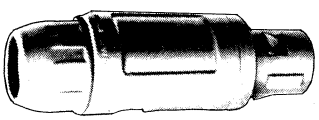
Material

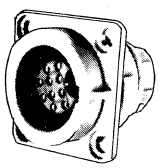
Outershell, sleeve, collet	PSU (MIL-P-46120 (MR)
Insulator	PEEK
Male contacts solder	Brass ASTM C 385
Male crimp and earthing	Brass ASTM C 345
Female contact solder, crimp and earthing	Bronze ASTM C 544
Collet washer	Silicone rubber VRP 3003/40 A-B (FS ZZ-R765, cl. 2a/2b, gr. 40)

Climatic Properties

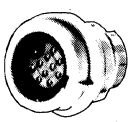
Working temperature	−50°C + 150°C (−58°F + 302°F)
Waterproofness	Splashproof CEI 61 (mated connectors)
Sterilization	Steam (130° C to 140°C) Steam with formol (70°C) Gas (60°C)

FGG





EBG



EGG

New is the IP Series which includes from 2-9 contacts Please contact LEMO USA for more information

High Voltage Connectors

HIGH VOLTAGE INSERTS

Number of Contacts	Wire Max AWG	Working Voltage KVdc	Test Voltage KVdc	Rated Current	Shell Size
1	26	8	12	4	0S
1	22	12	18	6	1S
1	20	10	15	8	1Y
1	12	16	24	15	3Y
4	22	12	18	4	4B
7	22	12	18	4	4B
14	22	12	18	4	5B
21	22	12	18	4	5B

Working voltage as per IEC 130.1 section 14.56

$$= \frac{\text{Test Voltage}}{1.5}$$

Test voltage as per MIL-Std 1344A medth. 3001.1

Please contact LEMO USA for collet specifications and information on other High Voltage connectors.

For applications which require HV contacts mixed with signal contacts please see MIXED CONTACT SERIES under B & S SERIES sections.

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eem MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination*. This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float*. Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof*. May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card*. The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement*.

Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

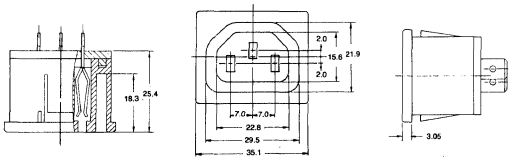
Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage*. Can be confused with the term used to describe how many times a connector may be mated and separated.

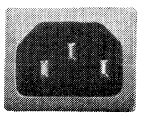
Withstanding voltage: Also called *test voltage*. The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

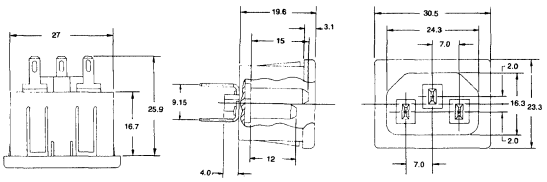
POWER ENTRY CONNECTORS

PANEL MOUNT RECEPTACLES/SNAP-IN TYPE



ACC014
for 25 x 32.5mm panel opening





ACC016
for 20 x 27.5mm panel opening

ORDER OPTIONS

ACC014 B A

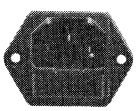
ACC014
ACC016

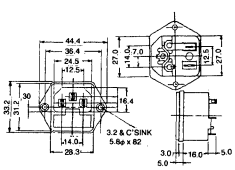
Panel Thickness
A = .062″
B = .090″
C = .125″

Tab Contact
A = .110″
B = .187″
C = .250″

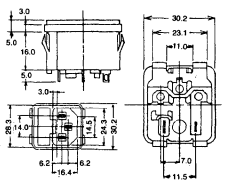
Rating: 15A 250V.
Insulation Resistance: 100MΩ Minimum
Dielectric Strength: 2000V
UL: E81043 15A 250V

PANEL MOUNT RECEPTACLES WITH FUSE HOLDER





ACC012

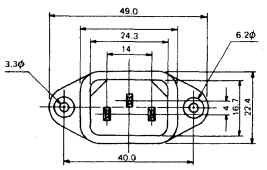


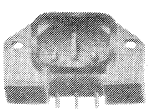
ACC013

Rating: 6A 250V.
Insulation Resistance: 100MΩ Minimum
Dielectric Strength: 2000V
UL: E110582 6A 250V
CSA: LR-45572 6A 250V

ACC008

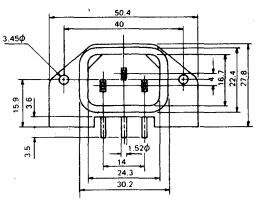
Rating: 15A 250V - 6A 250V
Insulation Resistance: 100MΩ Minimum
Dielectric Strength: 2000V
UL: E67635
CSA: LR-45572
VDE: 45151 10A 250V 6A 250V

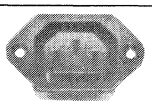




ACC009

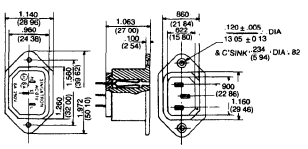
Rating: 15A 250V - 6A 250V
Insulation Resistance: 100MΩ Minimum
Dielectric Strength: 2000V
UL: E67635
CSA: LR-45572
VDE: 45151 10A 250V 6A 250V





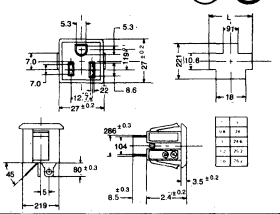
ACC010

Rating: 6A 250V - 15A 250V
Insulation Resistance: 100MΩ Minimum
Dielectric Strength: 2000V
UL: E81043
CSA: LR-45572
VDE: 2161 10A 250V 6A 250V



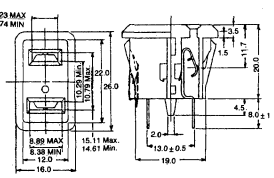
ACC011

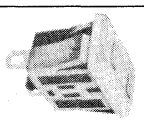
Rating: 15A 125V
Insulation Resistance: 100MΩ at 500V DC
Dielectric Strength: 1000V AC/1 Minute
UL: 81043
CSA: 45572



ACC004
POLARIZED

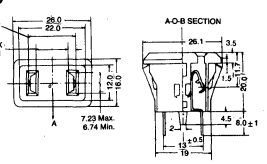
Rating: AC 125V 15A
Insulation Resistance: DC500V 100MΩ Min.
Insulation Voltage Withstand: AC1500V 1 minute
UL APPROVED FILE NO E81043
CSA: LR-45572





ACC005
NON-POLARIZED

Rating: AC 125V 15A
Insulation Resistance: DC500V 100MΩ Min.
Insulation Voltage Withstand: AC1500V 1 minute
UL APPROVED FILE NO E81043



TURN TO EEM PAGE C•1872 FOR OUR COMPLETE SELECTION OF POWER CABLES.

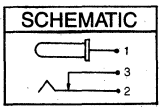
LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

DC POWER JACKS

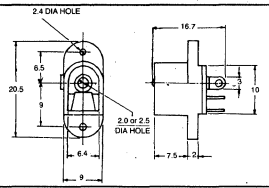
SPECIFICATIONS: Contact Resistance: 30 MΩMax
Insulation Resistance: 50 MΩ min at 100 VDC
Insulation Withstand Voltage: AC 250V
R.M.S. for 1 minute

Pin Diameter: 2.0mm or 2.5mm
Specify "A" Suffix for 2.0mm E.G. DJ001A
Specify "B' Suffix for 2.5mm E.G. DJ001B

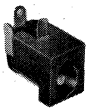
SCHEMATIC

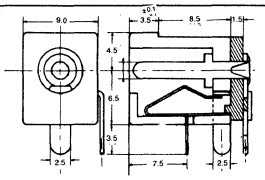


DJ001
Panel Mount

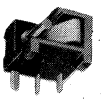


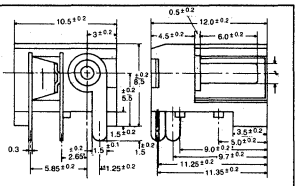
DJ005
PCB Mount



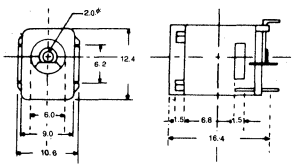


DJ009
PCB Mount

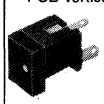


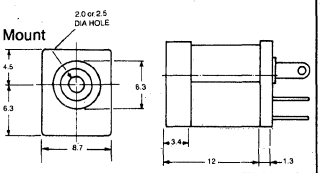


RL11
Vertical Mount

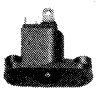


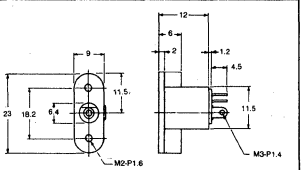
RL9
PCB Vertical Mount



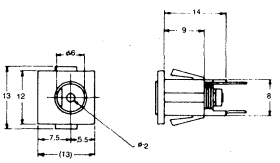


RL201
Panel Mount

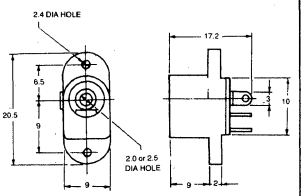




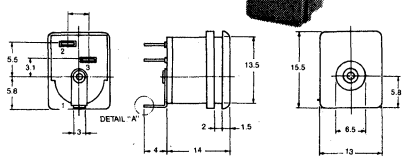
WK01
Vertical Mount



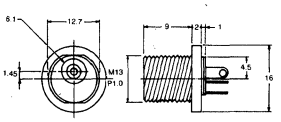
RL204
Panel Mount



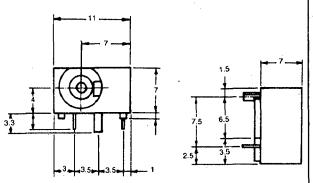
RL15
Panel Mount



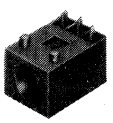
RL17
Panel Mount

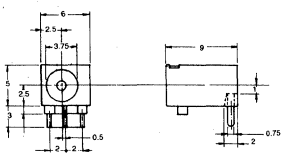


RL16
PCB Mount

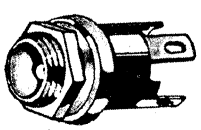


RL24
PCB Mount
PIN DIA: 1.3mm

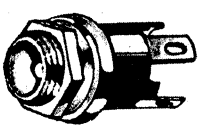




RL25
Panel Mount
2 circuit



RL26
Panel Mount
3 circuit



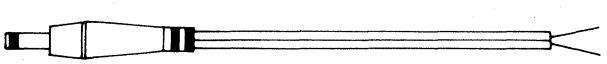
DC Power Plugs
Assembly
Type

HP114A:2.1/5.5/10 mm I.D./O.D./Shaft Length
HP114B:2.5/5.5/10 mm I.D./O.D./Shaft Length
HP114C:1.3/3.4/10 mm I.D./O.D./Shaft Length

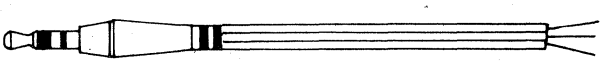
DC power cords 6 ft. long 22 AWG, stripped and tinned leads

DC10A
5.5 x 2.1mm plug

DC10B
5.5 x 2.5mm plug

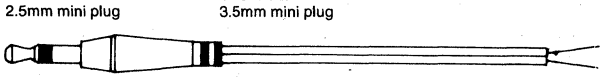


DC12
3.5mm Stereo plug–3 cond.



DC11A
2.5mm mini plug

DC11B
3.5mm mini plug



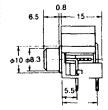
OPTIONS:
- Plugs on both ends
- Round Cords
- Round Shielded Cords
- Special Lengths

We can make any cable or molded cable assembly to your specifications.

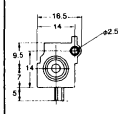
LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

PCB MOUNT RCA CONNECTORS

Right Angle PC Board Mount



01P0601



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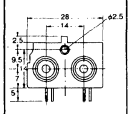

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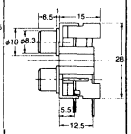

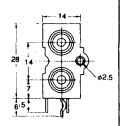

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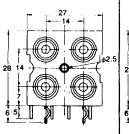

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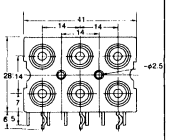
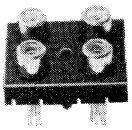
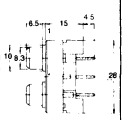


06P0606

PC Board Vertical Mount





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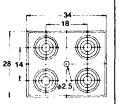

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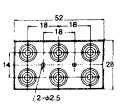

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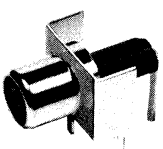

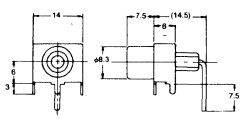

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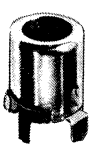
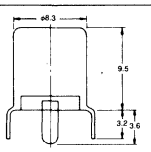
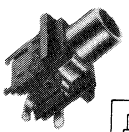
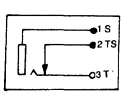


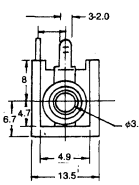


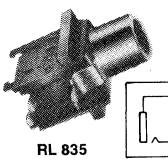
1771P145



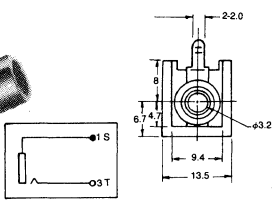
RL 834

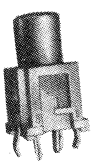


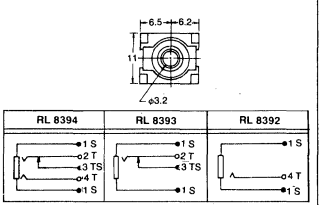




RL 835







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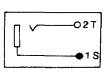
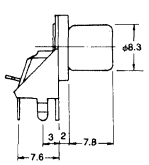
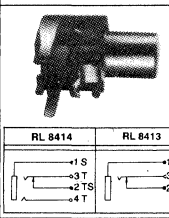
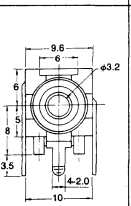
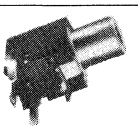
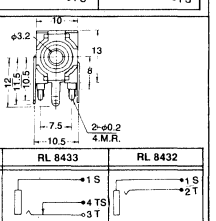


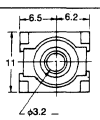


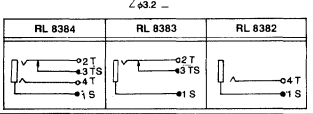


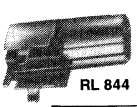




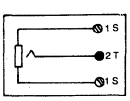


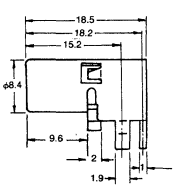






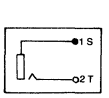
RL 844

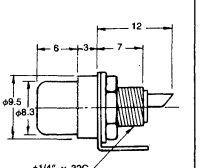


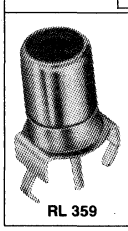


Panel Mount Jack

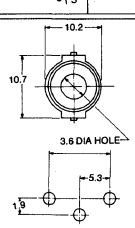
RL 837

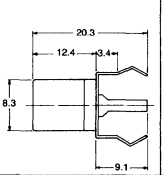


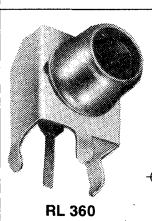




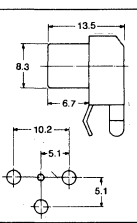
RL 359

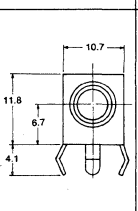






RL 360





RCA PLUG-W/PLASTIC HANDLE. COLOR: BLACK, RED, WHITE

HP 115

RCA JACK-W/PLASTIC HANDLE.

HP 118

RCA PLUG SOLDERLESS TYPE

CVP 299

RIGHT ANGLE, RCA PLUG SOLDERLESS TYPE

CVP 300

RCA CUSTOM CABLE ASSEMBLIES

2 RCA plugs and 2 RCA plugs

Plug to Plug, Plug to Jack, any combination RCA, "D" sub, DIN
For Further Information Please Refer TO EEM Pages C•1868-1872
or Call Our Sales Office.

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

2.5mm MINIATURE JACKS

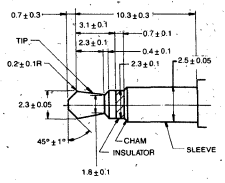


Fig. 1 Matching Plug (Mono)

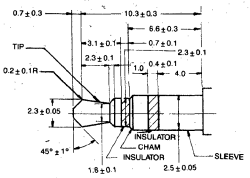
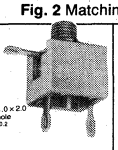
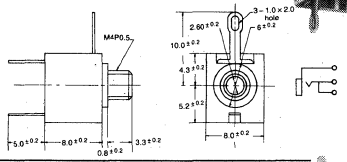


Fig. 2 Matching Plug (Stereo)

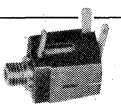
Contact Resistance: 30mΩ MAX.
Insulation Resistance: 50mΩ Min. at 100V DC
Insulation Withstand Voltage: AC250V r.m.s. for one minute

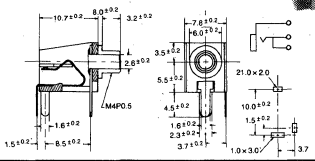
SJ250
2.5 φ Miniature Phone Jack



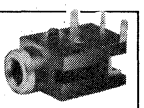


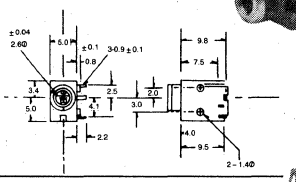
SJ251
2.5 φ Miniature Phone Jack



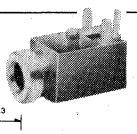


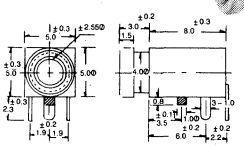
RL252
2.5 φ P.C.B. Type Earphone Jack



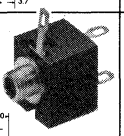


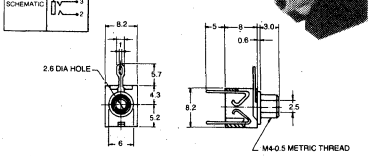
RL254
2.5 φ P.C.B. Type Earphone Jack



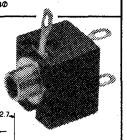


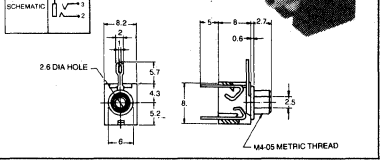
RL255
Switch (Mono)





RL256
Switch (Stereo)





3.5mm PHONE/STEREO JACKS

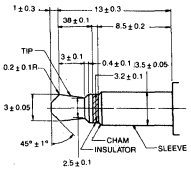


Fig. 1 Matching Plug (Mono)

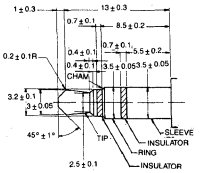
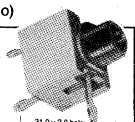
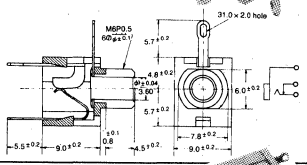


Fig. 2 Matching Plug (Stereo)

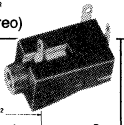
Contact Resistance: 30mΩ MAX.
Insulation Resistance: 50mΩ Min. at 100V DC
Insulation Withstand Voltage: AC250V r.m.s. for one minute

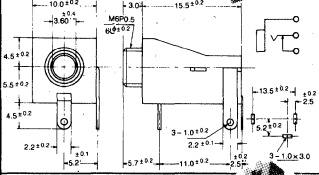
SJ350
3.5 φ Miniature Phone Jack



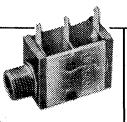


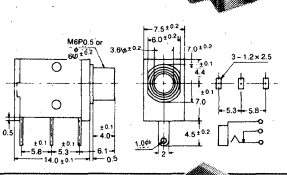
SJ352
3.5 φ Miniature Phone Jack



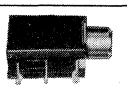


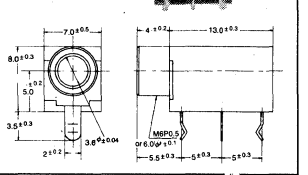
SJ360
3.5 φ Miniature Phone Jack



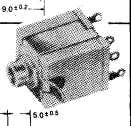


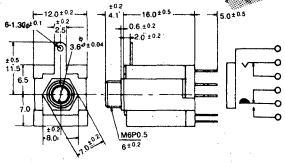
SJ370
3.5 φ Miniature Phone Jack



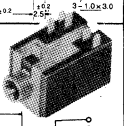


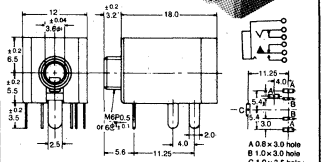
SJ351
3.5 φ Miniature Phone Jack



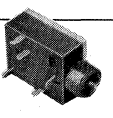


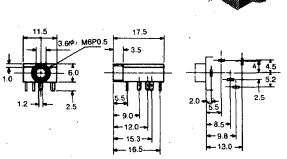
SJ358
3.5 φ Miniature Phone Jack



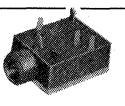


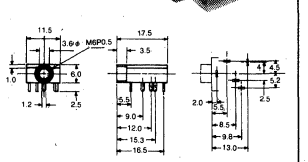
SJ362
3.5 φ Stereo Jack



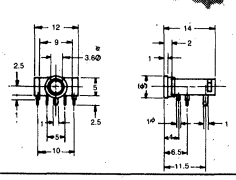


SJ363
3.5 φ Stereo Jack

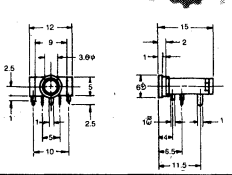




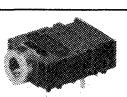
SJ100
3.5 φ Stereo Jack

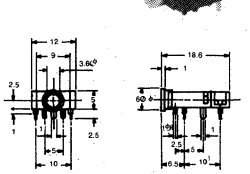


SJ200
3.5 φ Stereo Jack

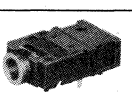


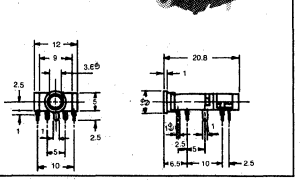
SJ300
3.5 φ Stereo Jack
with 1P2T Switch





SJ400
3.5 φ Stereo Jack
with 2P2T Switch



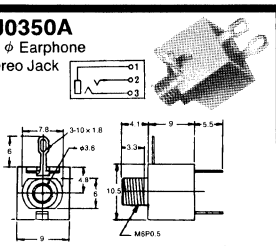


NOTE: For mating plugs & inline jacks see next page

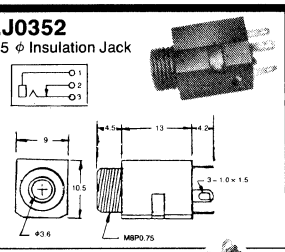
3.5mm Phone Jacks Continue on next page

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

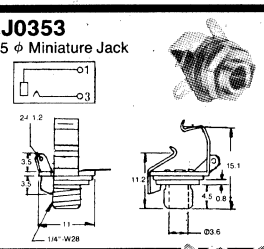
LJ0350A
3.5 φ Earphone
Stereo Jack



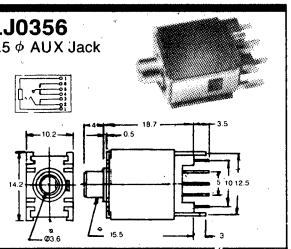
LJ0352
3.5 φ Insulation Jack



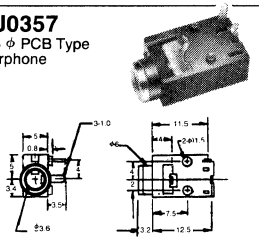
LJ0353
3.5 φ Miniature Jack



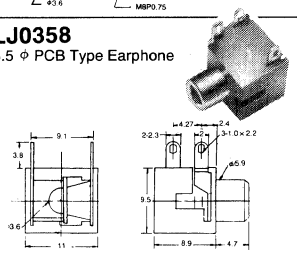
LJ0356
3.5 φ AUX Jack



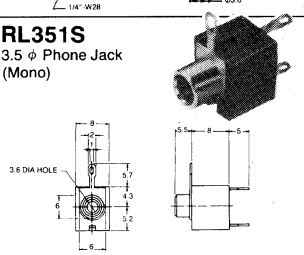
LJ0357
3.5 φ PCB Type
Earphone



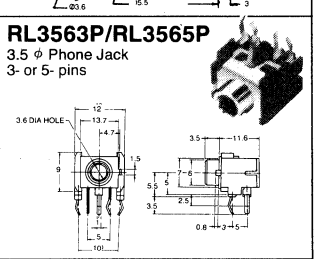
LJ0358
3.5 φ PCB Type Earphone



RL351S
3.5 φ Phone Jack
(Mono)

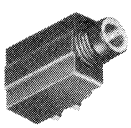


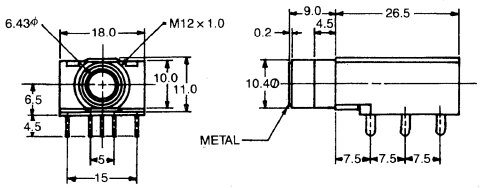
RL3563P/RL3565P
3.5 φ Phone Jack
3- or 5- pins



1/4" -6.3φ PHONE JACKS

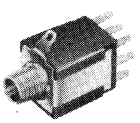
PCB MOUNT



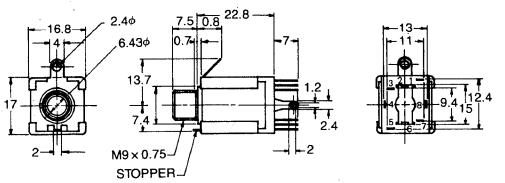


Schematic	LJ901	LJ900	LJ903	LJ904	LJ902

PANEL MOUNT

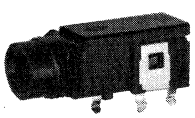


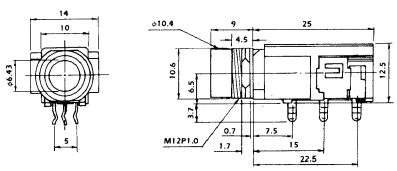
Schematic / Stopper			
With	LJ651SHW(SRW)	LJ650SHW(SRW)	LJ666SHW(SRW)
Without	LJ651OHW(ORW)	LJ650OHW(ORW)	LJ666OHW(ORW)



MINIATURE HEADPHONE JACKS, 1/4" (6.3 φ mm)

PCB MOUNT

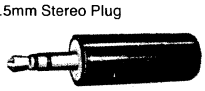




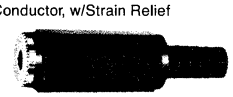
RL66-1	RL66-2	RL66-3	RL66-4
1S 2T	1S 2T 3R	1S 2T 4TS	1S 2T 4TS 3R

MATING PLUGS & INLINE JACKS

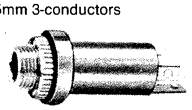
HP113 –2.5mm Mono Submini Plug, Plastic Handle, Solder Term.
HP113S–2.5mm Stereo Plug



HP053–2.5mm Mono Inline Jack, 2-Conductor, w/Strain Relief
HP054–2.5mm Stereo Inline Jack, 3-Conductor, w/Strain Relief



Stereo Panel Mount Phone Jack
HP055–3.5mm 3-conductors
HP056–2.5mm 3-conductors



HP147–3.5mm Mono Plug; w/Strain Relief, Solder Term.
HP148–3.5mm Stereo plug

HJ243–3.5mm Mono Inline Jack, 2-Condcutor, w/Strain Relief
HJ242–3.5mm Stereo Inline Jack, 3-Conductor, w/Strain Relief

1/4" Plug, Solder Terminals with strain relief
HP146–Mono Type
HP145–Stereo Type

1/4" Inline Jack Solder Terminals with strain relief
HJ241–Mono Type
HJ240–Stereo Type

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

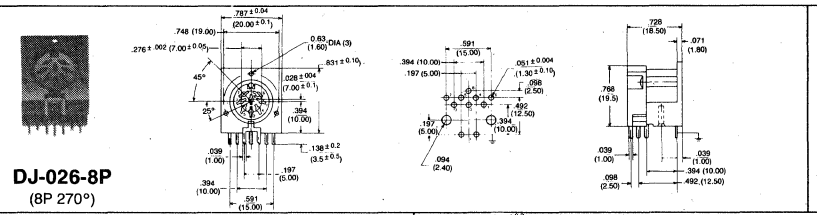
DIN PLUGS, JACKS & SOCKETS

PCB MOUNT CONNECTORS, SHIELDED & UNSHIELDED.

SPECIFICATIONS

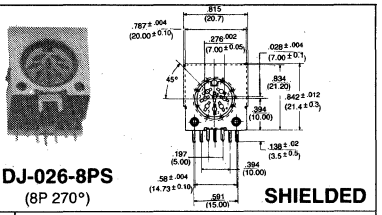
1. CONTACT RESISTANCE: 20m Ω Max.
2. INSULATION RESISTANCE: DC 500 V 10^5M Ω Min.
3. VOLTAGE WITHSTANDING: AC 500V 1 MINUTE.
4. INSERTION FORCE: 5.0 Kg. Max.
5. WITHDRAWAL FORCE: 1-3.5 Kg.
6. LIFE TEST: 5,000 CYCLES MIN. AFTER TESTING, CONTACT RESISTANCE SHALL NOT EXCEED 100m Ω
7. MATES WITH PLUG DIA.: .520 ϕ ± .008 (13.2 ± 0.2)
   .536 ϕ ± .004 (13.6 ± 0.1)

A



DJ-026-8P
(8P 270°)

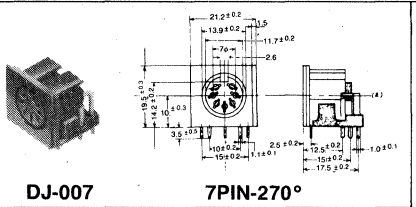
B



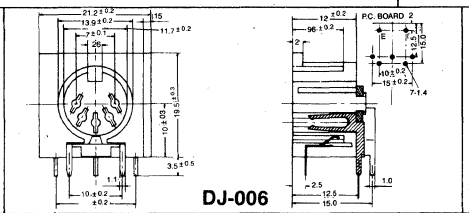
DJ-026-8PS
(8P 270°)

SHIELDED

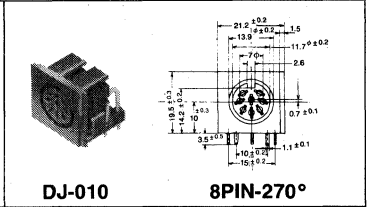
C



DJ-007 **7PIN-270°**



DJ-006



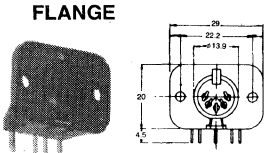
DJ-010 **8PIN-270°**

D–DIN MALE SOCKET

DJ014P5
(5P 180°)

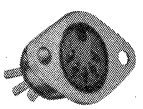
DJ014P7
(7P 270°)

E–DIN JACK WITH FLANGE

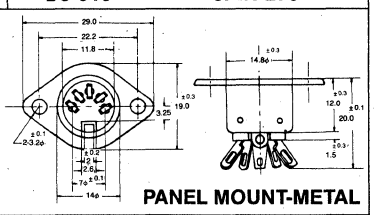


1785S040

F–DIN METAL SOCKET



SD50SN



PANEL MOUNT-METAL

G–DIN PLASTIC SOCKET-PANEL MOUNT

SD50S

H–DIN PLUG FOR CABLE ASSEMBLY TYPE

OPTIONAL: METAL SHIELDED SLEEVE

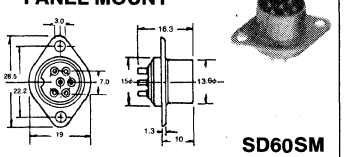
SD70

I–DIN JACK FOR CABLE ASSEMBLY TYPE

OPTIONAL: METAL SHIELDED SLEEVE

SD70J

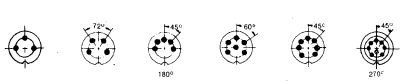
J–DIN MALE SOCKET-PANEL MOUNT



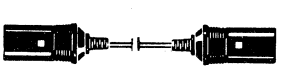
SD60SM

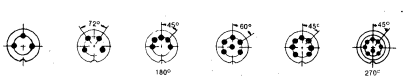
Description	Configuration	3 Pin 180°	4 Pin 210°	5 Pin 180°	5 Pin 240°	5 Pin 360°	6 Pin 240°	7 Pin 270°	8 Pin 270°	8 Pin 262°
A.	PC DIN Jack	DJ0203P	DJ0224P	DJ0215P	DJ0235P	N/A	DJ0246P	DJ0257P	DJ0268P	DJ0278P
B.	PC DIN Jack-Shielded	DJ0203PS	DJ0224PS	DJ0215PS	DJ0235PS	N/A	DJ0246PS	DJ0257PS	DJ0268PS	DJ0278PS
C.	PC DIN Jack	N/A	N/A	DJ006	N/A	N/A	DJ0196P	DJ007	DJ010	N/A
D.	PC Male DIN Jack	N/A	N/A	DJ014P5	N/A	N/A	N/A	DJ014P7	N/A	N/A
E.	PC DIN Jack-Wide	N/A	N/A	1785S040	N/A	N/A	1826J096	N/A	N/A	N/A
F.	DIN Socket Panel-Metal	SD30SN	SD40SN	SD50SN	SD51SN	SD52SN	SD60SN	SD70SN	SD80SN	SD81SN
G.	DIN Socket-Panel Mount	SD30S	SD40S	SD50S	SD51S	SD52S	SD60S	SD70S	SD80S	SD81S
H.	DIN Plug	SD30	SD40	SD50	SD51	SD52	SD60	SD70	SD80	SD81
I.	DIN Jack	SD30J	SD40J	SD50J	SD51J	SD52J	SD60J	SD70J	SD80J	SD81J
J.	DIN Male Socket-Panel	SD30SM	SD40SM	SD50SM	SD51SM	SD52SM	SD60SM	SD70SM	SD80SM	SD81SM

CUSTOM MOLDED CABLE ASSEMBLIES



3 4 5 6 7 8





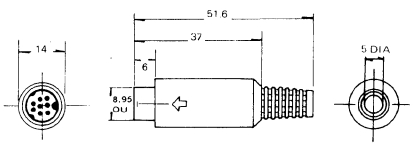
3 4 5 6 7 8

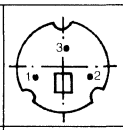
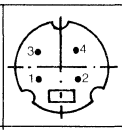
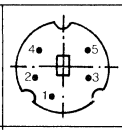
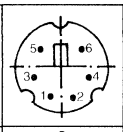
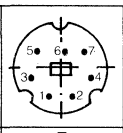
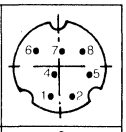
Plug to plug, plug to jack, combination "D" sub, micro DIN, etc. straight, coiled or shielded type. For further info please refer to EEM pages C•1868-1872 or call our sales office.

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

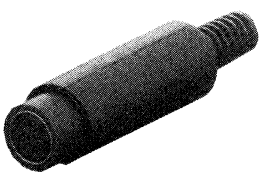
MICRO DIN PLUGS, JACKS, PC BOARD & PANEL MOUNT CONNECTORS

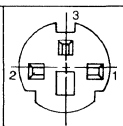
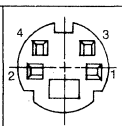
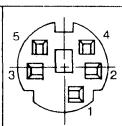
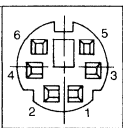
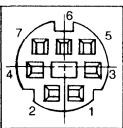
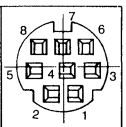
MICRO DIN PLUG ASSEMBLY TYPE



PIN Layout:						
No. of PINs:	3	4	5	6	7	8
Part No.:	MD30	MD40	MD50	MD60	MD70	MD80

MICRO DIN INLINE JACK ASSEMBLY TYPE



PIN Layout:						
No. of PINs:	3	4	5	6	7	8
Part No.:	MD30J	MD40J	MD50J	MD60J	MD70J	MD80J

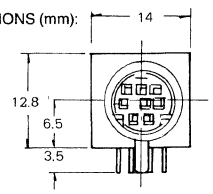
PCB MOUNT JACK

SHIELDED

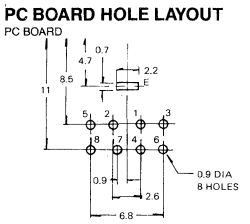
SPECIFICATIONS

Rating:	1A, 100V AC 2A, 12V DC
Insulation Resistance:	50MΩ Min
Dielectric Strength:	250V DC/1 minute
Contact Resistance:	30mΩ Max
Insertion Force:	4.5kg Max
Extraction Force:	1–3kg

DIMENSIONS (mm):



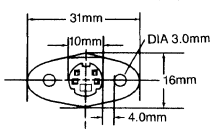
PC BOARD HOLE LAYOUT



PIN layout; the same as Inline Jack above

No. of Contacts:	3	4	5	6	7	8
PCB Mount Din Jacks	MDJ3P	MDJ4P	MDJ5P	MDJ6P	MDJ7P	MDJ8P
PCB DIN Jack Shielded	MDJ3PS	MDJ4PS	MDJ5PS	MDJ6PS	MDJ7PS	MDJ8PS

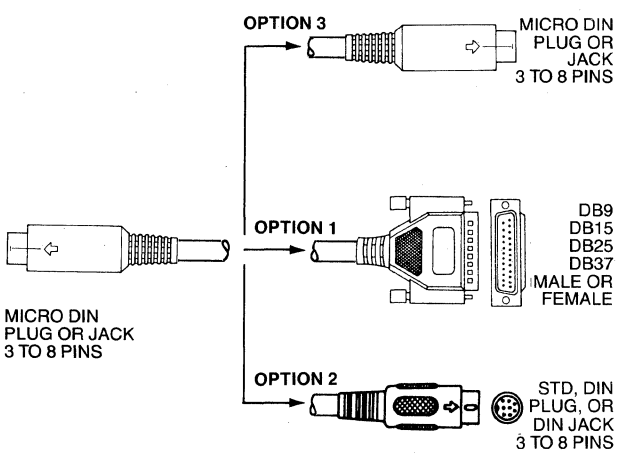
PANEL MOUNT SOCKET



PIN layout, the same as Inline Jack above.

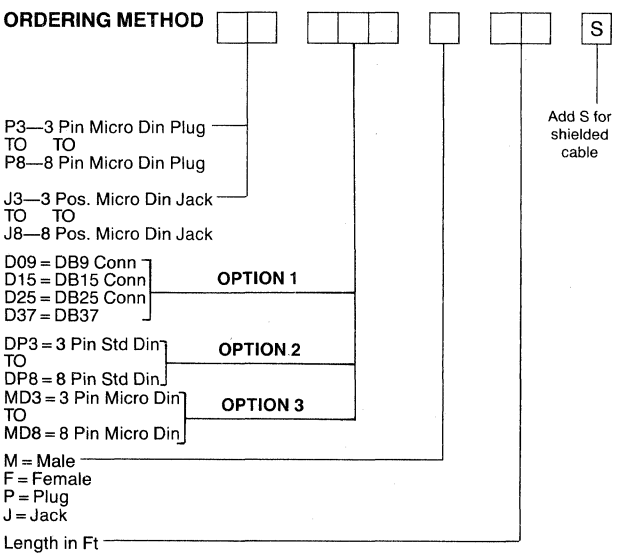
No. of Contacts:	3	4	5	6	7	8
Part No.	MD30S	MD40S	MD50S	MD60S	MD70S	MD80S

CUSTOM MADE MOLDED MICRO-DIN CABLE ASSEMBLIES



OTHER COMBINATIONS ARE AVAILABLE UPON REQUEST

ORDERING METHOD

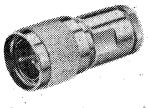


Example: P5D37M12S = 5 Pin Micro Din Plug to DB37 Male Conn. 12 ft., shielded.

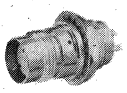
LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

COAXIAL CONNECTORS AND ADAPTERS

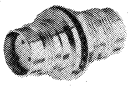
TWINAXIAL CONNECTORS



CVP-001
TWINAXIAL MALE CONNECTOR

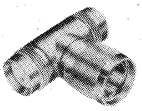


CVP-003
TWINAXIAL REAR MOUNT BULKHEAD

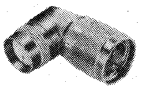


CVP-006
TWINAXIAL DOUBLE FEMALE

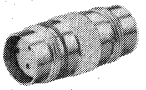
CVP-004
TWINAXIAL "T" ADAPTER



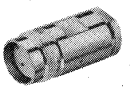
CVP-007
TWINAXIAL T ADAPTER



CVP-008
TWINAXIAL L ADAPTER

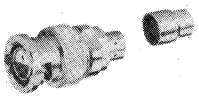


CVP-002
DOUBLE FEMALE CONNECTOR

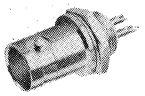


CVP-005
TWINAXIAL FEMALE CONNECTOR

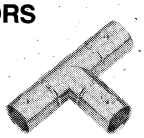
BNC CONNECTORS



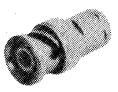
CVP-2001
CONNECTOR BNC TWIN PLUG CRIMP TYPE



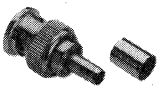
CVP-2-002
CONNECTOR BNC TWIN FEMALE CHASSIS MOUNT



CVP-2-003
ADAPTER BNC TWIN THREE FEMALE

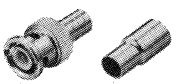


CVP-220
BNC MALE CONNECTOR

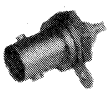


CVP-220A
BNC MALE CONNECTOR CRIMP TYPE

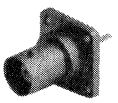
CVP-220A1
BNC MALE CONNECTOR MOLDED TYPE



CVP-220C
BNC CRIMP TYPE TWO PIECE CONSTRUCTION

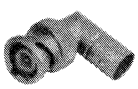


CVP-230
BNC FEMALE CONNECTOR

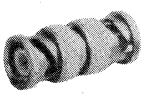


CVP-231
BNC FEMALE CONNECTOR

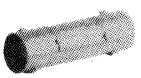
CVP-218
"T" TYPE CONNECTOR 2 - BNC JACK TO 1 - BNC PLUG



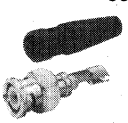
CVP-217
"L" TYPE CONNECTOR BNC JACK TO BNC PLUG



CVP-223
BNC DOUBLE MALE ADAPTER



CVP-228
DOUBLE FEMALE CONNECTOR

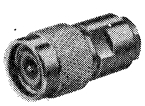


CVP-283
BNC PLUG SOLDERLESS TYPE

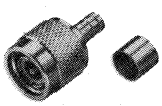
CVP-281
BNC MALE RIGHT ANGLE

CVP-283A
BNC JACK SOLDERLESS TYPE

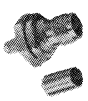
TNC CONNECTORS



CVP-011
TNC MALE CONNECTOR



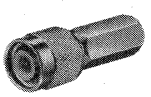
CVP-012
TNC CRIMP TYPE MALE CONNECTOR



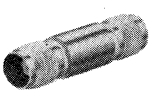
CVP-014
TNC CRIMP TYPE FEMALE CONNECTOR

CVP-017
ADAPTOR TNC RIGHT ANGLE

CVP-018
TNC CABLE CRIMP SOCKET



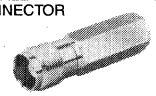
CVP-019
TNC THREAD ON PLUG



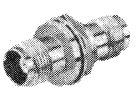
CVP-020
ADAPTER TNC DOUBLE FEMALE

CVP-026
DOUBLE TNC MALE

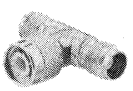
CVP-013
TNC FEMALE CONNECTOR



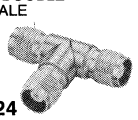
CVP-022
TNC FEMALE CONNECTOR TWIST ON



CVP-023
DOUBLE TNC FEMALE

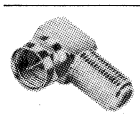


CVP-025
TNC "T" ADAPTER

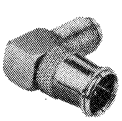


CVP-024
TNC "T" ADAPTER

F CONNECTORS

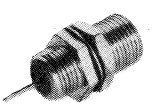


CVP-259
"L" TYPE CONNECTOR F PLUG TO F JACK

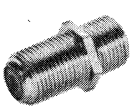


CVP-259A
ADAPTER PUSH-ON F MALE TO F FEMALE

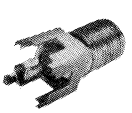
CVP-262
"F" PLUG TO "F" JACK PUSH-ON



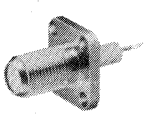
CVP-272A
CHASSIS MOUNT CONNECTOR



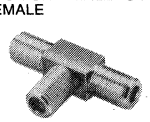
CVP-271
DOUBLE FEMALE CHASSIS MOUNT CONNECTOR



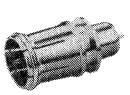
CVP-272B



CVP-666
F RECEPTACLE



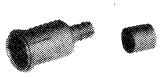
CVP-665
"T" ADAPTER THREE FEMALE



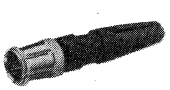
CVP-668
MOLDED TYPE PUSH-ON CONNECTOR

CVP-289
F CONNECTOR PUSH-ON

CVP-256
"F" CONNECTOR
(A) FOR RG-58/U TYPE CABLE (DIA 3.3mm)
(B) FOR RG-59/U TYPE CABLE (DIA 3.9mm)
(C) FOR 5C 2V TYPE CABLE (DIA 5mm)



CVP-257
PUSH-ON "F" CONNECTOR
(A) FOR RG-58/U TYPE CABLE (DIA 3.3mm)
(B) FOR RG-59/U TYPE CABLE (DIA 3.9mm)
(C) FOR 5C 2V TYPE CABLE (DIA 5mm)



CVP-291
F TYPE PUSH-ON PLUG SOLDERLESS TYPE

CVP-292
RIGHT ANGLE F TYPE PUSH-ON PLUG SOLDERLESS TYPE

CVP-293
F PLUG SOLDERLESS TYPE

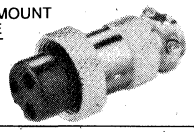
CBP-294
RIGHT ANGLE F PLUG SOLDERLESS TYPE

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

COAXIAL CONNECTORS AND ADAPTERS

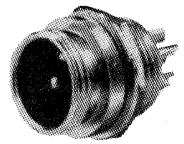
MICROPHONE CONNECTORS

CABLE MOUNT FEMALE SOCKET



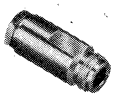
CONTACTS	PART NO.
2	1822K162
3	1823K165
4	1824K163
6	1826K167
8	1828K151

PANEL MOUNT MALE SOCKET

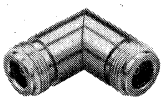


CONTACTS	PART NO.
2	1822K160
3	1823K166
4	1824K161
6	1826K168
8	1828K150

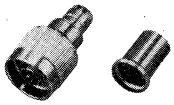
N CONNECTORS



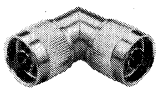
CVP-101
N CONNECTOR FEMALE (FOR RG-58/U, RG-59/U, 5C2V, 7C2V, CABLE)



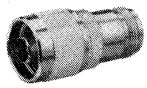
CVP-102
"L" TYPE CONNECTOR N-JACK TO N-JACK



CVP-104
N CONNECTOR MALE MOLDED & CRIMP TYPE

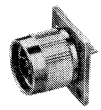


CVP-105
"L" TYPE CONNECTOR N-PLUG TO N-PLUG



CVP-106
N TYPE CONNECTOR N-PLUG TO N-JACK

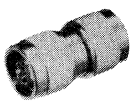
CVP-110
ADAPTER FOUR FEMALE



CVP-114
N-RECEPTACLE 4 HOLE FLANGE

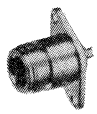
CVP-115
N FEMALE CONNECTOR

CVP-201
N CONNECTOR MALE



CVP-204
DOUBLE MALE CONNECTOR

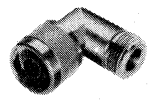
CVP-205
N CONNECTOR FEMALE



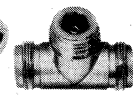
CVP-206
CVP-206A
N CONNECTOR FEMALE

CVP-212
T-ADAPTER 2XN JACK TO 1XN PLUG

CVP-209
DOUBLE FEMALE CONNECTOR



CVP-211
"L" TYPE CONNECTOR N-PLUG TO N-JACK

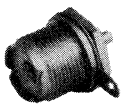


CVP-213
T-ADAPTER THREE FEMALE

UHF CONNECTORS

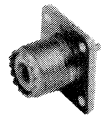
CVP-214
RT ANGLE CONNECTOR

CVP-216
T-ADAPTER THREE FEMALE



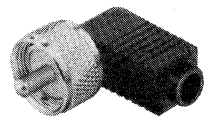
CVP-242
CHASSIS CONNECTOR (SO-239SH)

CVP-243
DOUBLE MALE ADAPTER



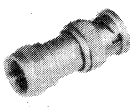
CVP-246
CHASSIS CONNECTOR

CVP-250
DOUBLE FEMALE



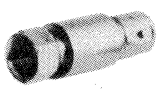
CVP-282
UHF MALE RIGHT ANGLE

BNC TO F ADAPTERS

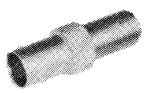


SVP-539
BNC PLUG TO F PLUG

SVP-533
F JACK TO BNC PLUG

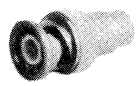


SVP-538
BNC JACK TO F PLUG



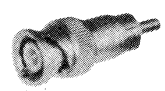
SVP-543
BNC JACK TO "F" JACK

BNC TO RCA PHONO ADAPTERS



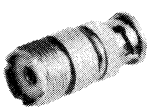
SVP-519
ADAPTER BNC MALE TO RCA PHONO JACK

SVP-525
BNC JACK TO RCA PHONO PLUG



SVP-518
ADAPTER BNC MALE TO RCA PHONO PLUG

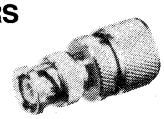
BNC TO UHF ADAPTERS



SVP-514
BNC MALE TO UHF FEMALE

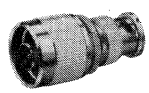
SVP-531
BNC JACK TO UHF JACK

SVP-507
BNC FEMALE TO UHF MALE

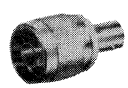


SVP-545
BNC PLUG TO UHF PLUG

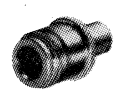
BNC TO N CONNECTOR ADAPTERS



CVP-108
N CONNECTOR/ N-P TO BNC-P



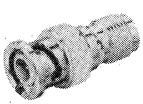
CVP-203
N CONNECTOR/ BNC-J TO N-P



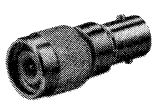
CVP-210
N CONNECTOR/ N-J TO BNC-J

CVP-208
N CONNECTOR/ N-J TO BNC-P

BNC TO TNC ADAPTERS



CVP-021
ADAPTER TNC FEMALE TO BNC MALE



CVP-015
TNC CONNECTOR TNC P TO BNC J ADAPTER

F TO N ADAPTERS

CVP-111
N FEMALE TO F MALE

CVP-112
ADAPTER N FEMALE TO F FEMALE

CVP-113
ADAPTER N MALE TO F MALE

F TO RCA PHONO ADAPTERS

SVP-536
F JACK TO RCA PHONO PLUG

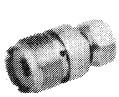
SVP-540
RCA PHONO PLUG TO F PLUG

SVP-541
RCA PHONO JACK TO F PLUG

F TO UHF ADAPTERS

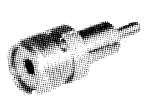
SVP-534
F JACK TO UHF FEMALE

SVP-535
F JACK TO UHF MALE



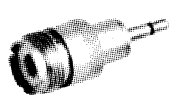
SVP-544
UHF FEMALE TO F PLUG

UHF TO RCA



SVP-512
ADAPTER PL-259 UHF FEMALE TO RCA PLUG

UHF TO PHONO



SVP-511
ADAPTER PL-259 UHF FEMALE TO 3.5mm PHONE PLUG

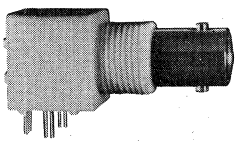
UHF TO N ADAPTERS

CVP-207
N CONNECTOR/UHF-P TO N-J

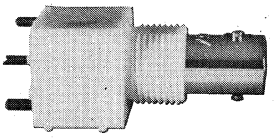
CVP-103
N CONNECTOR/N-J TO UHF-J

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

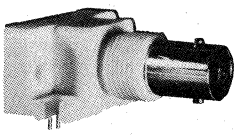
PC BOARD & PANEL MOUNT BNC CONNECTORS



MODEL: 0501610



MODEL: 0501630



MODEL: 0501640

SPECIFICATIONS:

1) Electrical

Impedance	: 50 ohm
Rated Voltage	: 500V
Frequency Range	: 0 to 4GHz
Contact Resistance	: Max. 3m ohm
Withstanding Voltage	: 1,500V

2) Circumstance Testing as per MIL-STD-1344

3) Cross Reference: MIL-C-39012/21 and JIS-C-5412.

MATERIALS & FINISH:

1) Shell: Zinc Die-Cast (Nickel-plated)

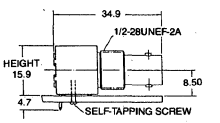
2) Center Contact: Phosphor Bronze (Tin, Silver or Gold Plated)

3) Insulator: Inner—Polypropylene Outer—White or Black Thermoplastic Polyester

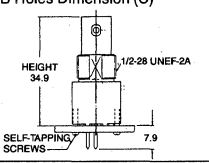
OPTIONS Add Letters after the P.N.

WT = Connector White Body and Center Contact Tin Plated
BT = Connector Black Body and Center Contact Tin Plated
WG = Connector White Body and Center Contact Gold Plated
BG = Connector Black Body and Center Contact Gold Plated

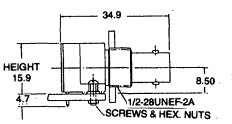
(1) 0501610
L-type without flange for both PCB/Panel mounting without mounting posts
PCB Holes Dimension (A)



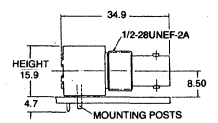
(3) 0501630
Straight without flange for PCB mounting without mounting posts
PCB Holes Dimension (C)



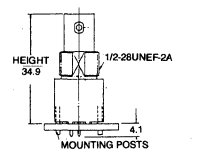
(5) 0501640
L-type with flange for PCB/Panel mounting
PCB Holes Dimension (E)



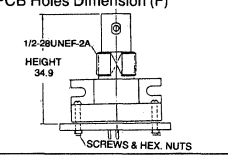
(2) 0501600—same as 0501610 except with mounting posts
PCB Holes Dimension (B)



(3) 0501620—sames as 0501630 except with mounting posts
PCB Holes Dimension (D)

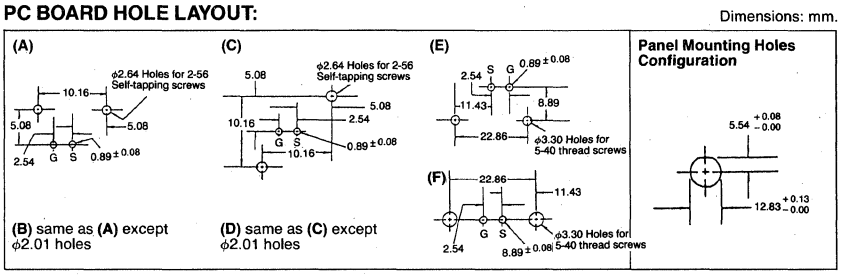


(3) 0501650
Straight with flange for PCB mounting
PCB Holes Dimension (F)



PC BOARD HOLE LAYOUT:

Dimensions: mm.



NOTE: 1. These connectors can be mounted on PC boards up to 3.18 mm thick and panels up to 6.35 mm thick
2. Connectors are supplied with mounting hardware
All the above connectors are available in TNC version for further information please contact our sales office.

PCB MOUNT COAXIAL CONNECTORS

BNC TYPE

050-1422

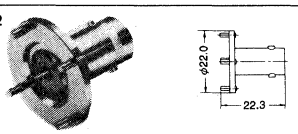


Fig. 1

050-1423

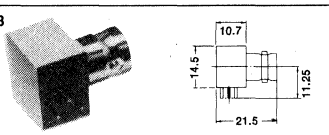


Fig. 2

050-1424

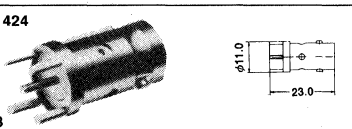


Fig. 3

050-1425

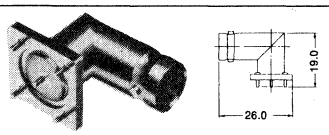


Fig. 4

050-1426

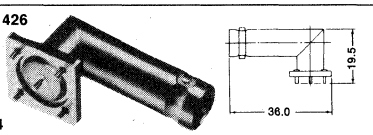


Fig. 4

050-1427

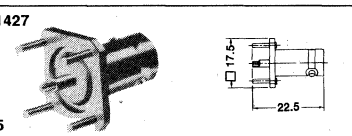


Fig. 5

050-1428

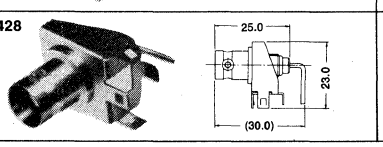
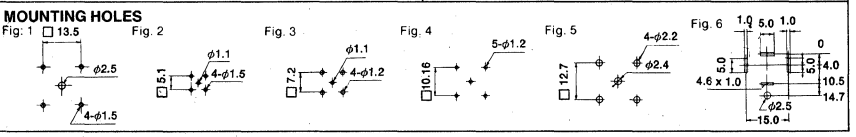


Fig. 6

MOUNTING HOLES



F TYPE

030-0935

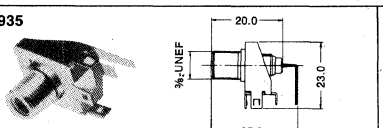


Fig. 6

031-2180

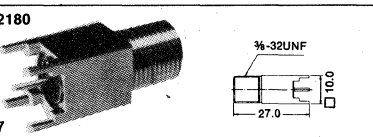


Fig. 7

031-2181

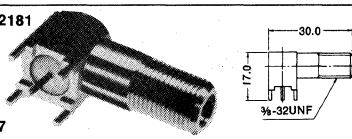
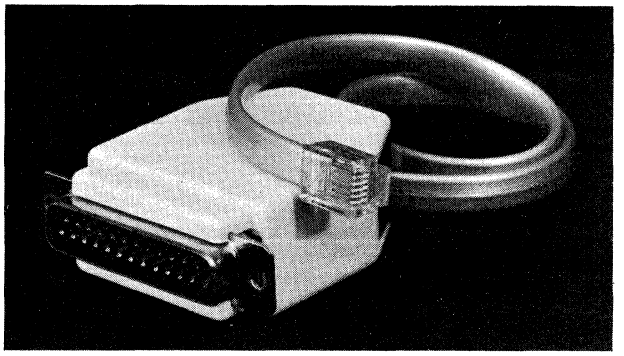


Fig. 7

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

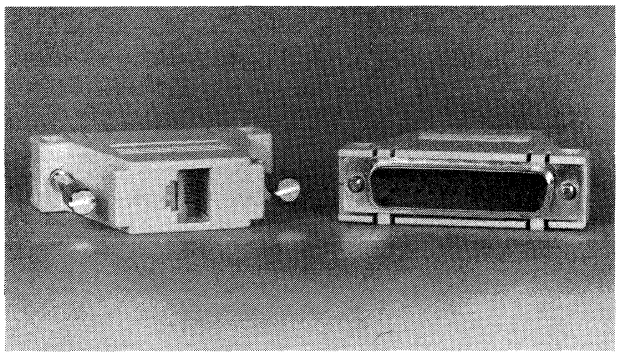
RS232 TO MODULAR TELEPHONE ADAPTERS

- Connects RS232 male or female ports to 4, 6 or 8 position modular Telephone Jacks
- Can be pre-wired to your specs or kit form for user assembly
- RS232 is selectively loaded using crimp terminals



Assembly type, off center telephone jack. Has option for two telephone jacks in back.

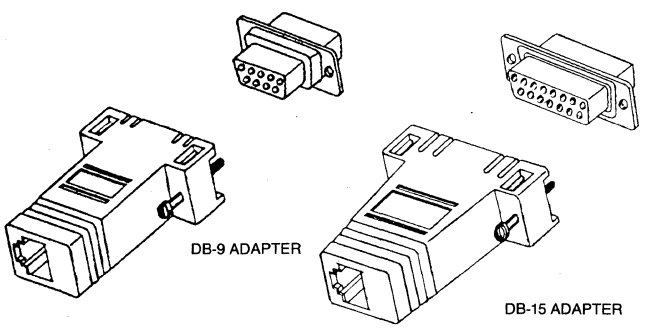
Model No	Description
4DB25M	DB25 Male to 6P4C Jack
4DB25F	DB25 Female to 6P4C Jack
6DB25M	DB25 Male to 6P6C Jack
6DB25F	DB25 Female to 6P6C Jack
8DB25M	DB25 Male to 8P8C Jack
8DB25F	DB25 Female to 8P8C Jack



Snap-in type with thumb screws. Centered jack in back. No tools required.

Model No	Description
4DB25MTS	DB25 Male to 6P4C Jack
4DB25FTS	DB25 Female to 6P4C Jack
6DB25MTS	DB25 Male to 6P6C Jack
6DB25FTS	DB25 Female to 6P6C Jack
8DB25MTS	DB25 Male to 8P8C Jack
8DB25FTS	DB25 Female to 8P8C Jack

9 PIN D-SUB TO MODULAR TEL. ADAPTERS
15 PIN D-SUB TO MODULAR TEL. ADAPTERS

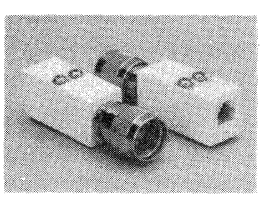


Part No.	Description
4DB9M	DB9 Male to 6P4C Jack
4DB9F	DB9 Female to 6P4C Jack
6DB9M	DB9 Male to 6P6C Jack
6DB9F	DB9 Female to 6P6C Jack
8DB9M	DB9 Male to 8P8C Jack
8DB9F	DB9 Female to 8P8C Jack

Part No.	Description
4DB15M	DB15 Male to 6P4C Jack
4DB15F	DB15 Female to 6P4C Jack
6DB15M	DB15 Male to 6P6C Jack
6DB15F	DB15 Female to 6P6C Jack
8DB15M	DB15 Male to 8P8C Jack
8DB15F	DB15 Female to 8P8C Jack

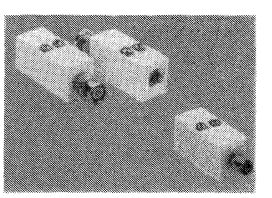
COAXIAL TO MODULAR TELEPHONE ADAPTERS

TWINAX BALUNS



Part No.	Description
TAXM RJ11	Twinax Male to RJ11 Telephone Jack
TAXF RJ11	Twinax Female to RJ11 Telephone Jack
TNCM RJ11	TNC Male to RJ11 Telephone Jack
TNCF RJ11	TNC Female to RJ11 Telephone Jack
TNCM RJ45	TNC Male to RJ45 Telephone Jack
TNCF RJ45	TNC Female to RJ45 Telephone Jack

BNC BALUNS



Part No.	Description
BNCM6P2C	BNC Male to 6P2C Jack
BNCF6P2C	BNC Female to 6P2C Jack
BNCM2ST	BNC Male to Screw Terminals
BNCF2ST	BNC Female to Screw Terminals
BNCMRJ45	BNC Male to RJ45, 8P8C Jack
BNCF RJ45	BNC Female to RJ45 8P8C Jack

LZRelectronics,inc.
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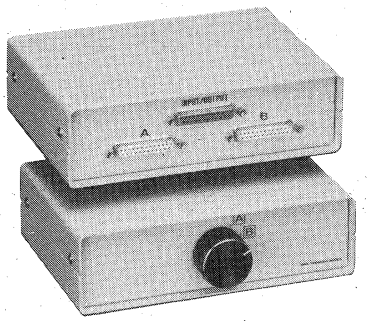
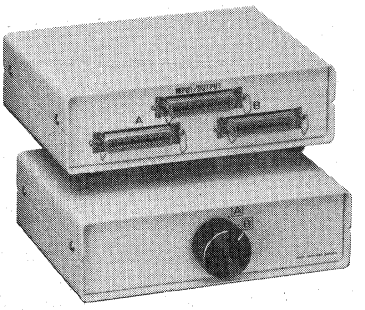
Telephone (301)921-9440 Fax (301)670-0436

DATA SWITCH BOXES & COMPUTER ACCESSORIES



RS 232 (DB 25), METAL, SHIELDED

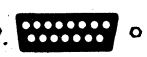
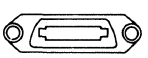
Model No	Description
LZ 3028	A, B — Switch, 2 way
LZ 3035	A,B,C — Switch, 3 way
LZ 3029	A,B,D,E — Switch, 4 way
LZ 3036	AaBb — Switch, X way



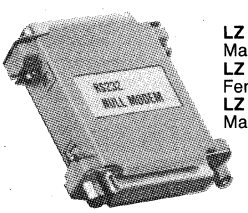
CENTRONICS®, 36 POSITION METAL, SHIELDED

Model No	Description
LZ 3031	A, B — Switch, 2 way
LZ 3032	A,B,C — Switch, 3 way
LZ 3030	A,B,D,E — Switch, 4 way
LZ 3033	AaBb — Switch, X way

OTHER SWITCH BOXES

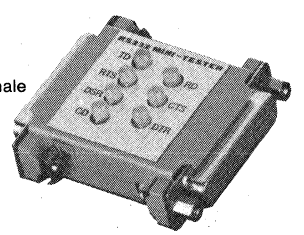
Model No	Configuration	Connector	Application	Type
DB15AB		DB-15	TI®, NCR POS & OTHERS	AB
DB15ABDE				ABDE
DB15X				X
DB9AB		DB-9	TEXAS INSTRUMENTS®, NCR® & OTHERS	AB
DB9ABDE				ABDE
DB9X				X
5724AB		IEEE-488	GPIB, HPIB & OTHERS	AB
5724ABDE				ABDE
5724X				X
BNCAB		BNC	Coaxial, Dual Coaxial interface	AB
BNCABDE				ABDE
BNCX				X
TWAXAB		Twinaxial	IBM® system 34, 36, 38, 5520	AB
TWAXABDE				ABDE
TWAXX				X
DB37AB		DB-37	RS-499, 423, 422 interace	AB
DB37ABDE				ABDE
DB37X				X
RJ45AB		RJ45	Data Telephone	AB
RJ45ABDE				ABDE
RJ45X				X

RS232 — NULL MODEM

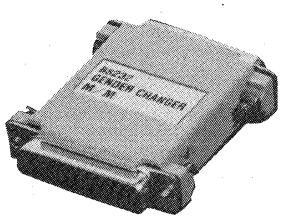


LZ 3019MM
Male to Male
LZ 3019FF
Female to Female
LZ 3019MF
Male to Female

RS232
Mini Tester
LZ 3017MF
Male to Female

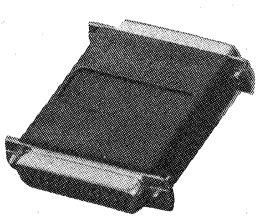


GENDER CHANGERS

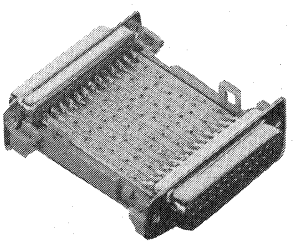


Model No	Description
LZ 3018MM	RS232 Male to Male
LZ 3018FF	RS232 Female to Female
LZ DB9MM	DB9 Male to Male
LZ DB9FF	DB9 Female to Female
LZ DB15MM	DB15 Male to Male
LZ DB15FF	DB15 Female to Female
LZ DB37MM	DB37 Male to Male
LZ DB37FF	DB37 Female to Female

Model No	Description
LZ 3027MM	Centronics®, 36 pos. Male to Male
LZ 3027FF	Centronics®, 36 pos. Female to Female
LZ 2536M	RS 232 Male to Centronics®, 36 pos. Male
LZ 25DB9	RS232 Male to DB9 Female



RS232
Surge Protector
LZ 3020-7
7 lines Protected



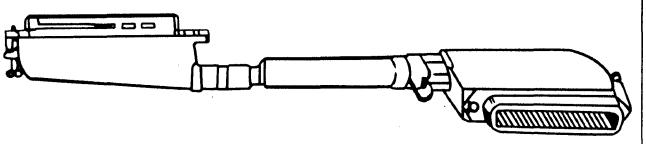
RS232—JUMPER BOX

Model No	Description
LZ 3016MM	Male to Male
LZ 3016MF	Male to Female
LZ 3016FF	Female to Female

Supplied with jumper wires, cover & hardware.

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

TELCO CABLING AND ACCESSORIES



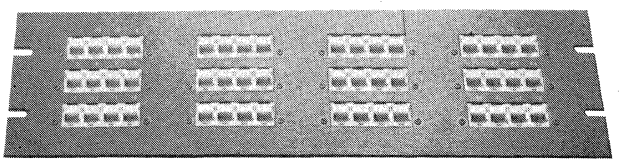
TRUNK FEEDER CABLE

High quality 25-pair cable, mated to your choice of connectors.

Gender \ Length	1′	10′	30′	50′	100′
Male to Female	N/A	TRF010MF	TRF030MF	TRF050MF	TRF100MF
Male to Male	TRF001MM	TRF010MM	TRF030MM	TRF050MM	TRF100MM
Female to Female	TRF001FF	TRF010FF	TRF030FF	TRF050FF	TRF100FF

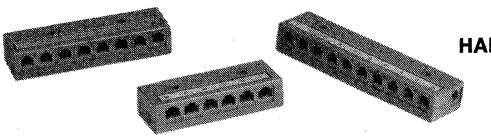
MODULAR PATCH PANELS AVAILABLE IN 48, 64, 96 PORT

Call us with your specific requirements.

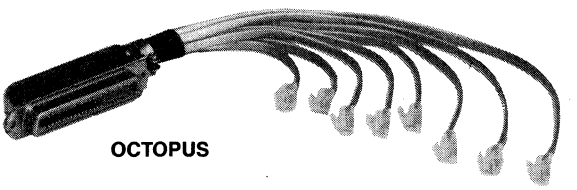


TRUNK SPLITTERS

For convenient, organized distribution of trunk signals



HARMONICA



OCTOPUS

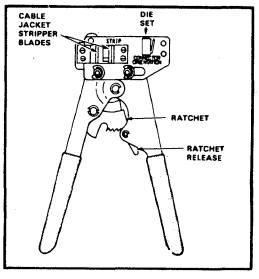
	25 CHANNEL 4P2C EACH	12 CHANNEL 6P4C EACH	8 CHANNEL 6P6C EACH	6 CHANNEL 8P8C EACH
OCTOPUS (50-PIN MALE)	TSC0225M	TSC0212M	TSC0208M	TSC0206M
HARMONICA (50-PIN MALE)	N/A	50M126P4C	50M86P6C	50M68P8C
HARMONICA (50-PIN FEMALE)	N/A	50F126P4C	50F86P6C	50F68P8C

Standard Octopus configuration includes a male 50-pin connector and 2′ of flat modular cord per channel.

Octopus cables with D-Sub termination, female 50-pin connector, and other lengths are also available.

Build your own modular line cords with the parts and tools below.
Or, see EEM Page C•1869 for LZR's standard- and custom-assembles.

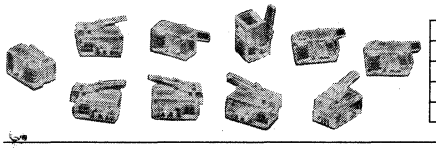
HEAVY-DUTY HAND CRIMP TOOL



FOR MODULAR PLUGS

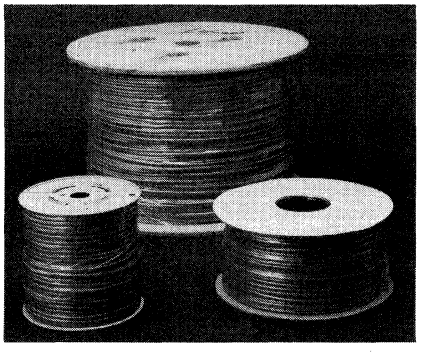
Model	Description
LZ4P4C	Crimp tool, complete with Die Set #DS4P4C, below
LZ6P6C	Crimp tool, complete with Die Set #DS6P6C, below
LZ8P8C	Crimp tool, complete with Die Set #DS8P8C, below
Connector die sets are interchangeable, and may be purchased separately:	
DS4P4C	for 4-position modular plugs, including hand cords
DS6P6C	for 6-position modular plugs (RJ-11)
DS8P8C	for 8-position modular plugs (RJ-45)

IDC-STYLE MODULAR PLUGS



PART NO.	TYPE
MP 4P4C	4 pos. 4 cond.
MP 6P4C	6 pos. 4 cond.
MP 6P6C	6 pos. 6 cond.
MP 8P8C	8 pos. 8 cond.

BULK CABLE



SHIELDED

MODEL	DESCRIPTION
TS1K31	1000 Ft. Reel, Flat, 3 Cond & Drain
TS1K51	1000 Ft. Reel, Flat, 5 Cond & Drain
TS1K71	1000 Ft. Reel, Flat, 7 Cond & Drain

UNSHIELDED

MODEL	DESCRIPTION
TC1K4C	1000 Ft. Reel, Flat Cord, 4C
TC3.5K4C	3,500 Ft. Reel, Flat Cord, 4C
TC5006C	500 Ft. Reel, Flat Cord, 6C
TC1K6C	1000 Ft. Reel, Flat Cord, 6C
TC2.5K6C	2500 Ft. Reel, Flat Cord, 6C
TC5008C	500 Ft. Reel, Flat Cord, 8C
TC1K8C	1000 Ft. Reel, Flat Cord, 8C
TC2K8C	2000 Ft. Reel, Flat Cord, 8C

FOR FURTHER INFORMATION, DETAILED SPECIFICATIONS & SAMPLES PLEASE CONTACT OUR SALES OFFICE.

LZR electronics, inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

MODULAR TELEPHONE ACCESSORIES

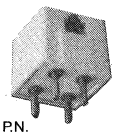
SPECIFICATION:

Insulation Resistance: : ≥ 500 megaohms
Dielectric Strength : 500 Vac rms, 60 Hz
Contact Resistance : ≤ 15 milliohms
Current Rating : 1½ AMP

BLISTER PACKS:

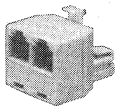
1. Blister Packs are available at slightly higher cost.
2. Minimum order is 2,000 units per each item.
3. Your own brand name is available too.

4 PRONG TO MODULAR ADAPTER



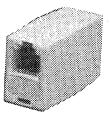
P.N.
TA 101

DUPLEX MODULAR SPLITTER



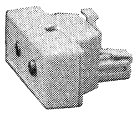
P.N.	
TA10244	4 Cond
TA10266	6 Cond
TA10248	8 Cond

MODULAR CORD COUPLER



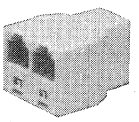
P.N.	DESCR.
TA10344	4 Cond.
TA10366	6 Cond.
TA10388	8 Cond.

RETRO-FIT ADAPTER



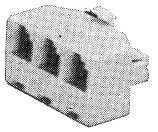
P.N.	DESCR.
TA104	4 Cond.

THREE WAY COUPLER



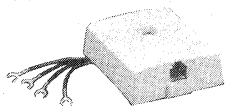
P.N.	DESCR.
TA106	4 Cond.

THREE WAY SPLITTER



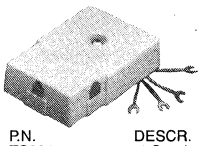
P.N.	DESCR.
TA108	4 Cond.

MODULAR JACK COVER



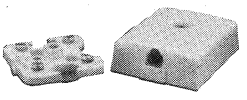
P.N.	DESCR.
TS201	4 Cond.
TS222	6 Cond.

THREE MODULAR JACKS COVER



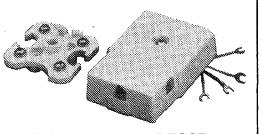
P.N.	DESCR.
TS234	4 Cond.

MODULAR JACK ASSEMBLY



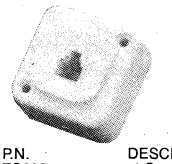
P.N.	DESCR.
TS202	4 Cond.
TS225	6 Cond.

THREE MODULAR JACKS ASSEMBLY



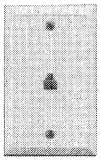
P.N.	DESCR.
TS235	4 Cond.

MODULAR JACK



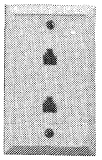
P.N.	DESCR.
TS203	4 Cond.

WALL MOUNTED MODULAR JACK



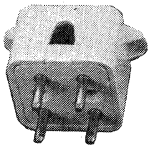
P.N.	DESCR.
TS2054C	4 Cond.
TS2056C	6 Cond.
TS2058C	8 Cond.

DUPLEX WALL JACK



P.N.	DESCR.
TS2074C	4 Cond.
TS2076C	6 Cond.
TS2078C	8 Cond.

STANDARD 4 PRONG PLUG

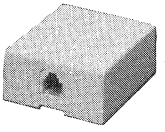


P.N.	DESCR.
TS211	4 Cond.

STAINLESS STEEL WALL PHONE JACK

P.N.	DESCR.
TS223	4 Cond.

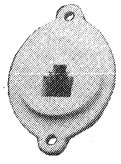
SURFACE JACK



P.N.	DESCR.
TS226	4 Cond.
TS227	6 Cond.
TS214	8 Cond.
TS231	8 Cond.

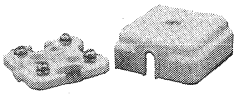
With Shorting Bars

MODULAR JACK



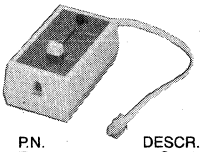
P.N.	DESCR.
TS230	4 Cond.

CONNECTIVE BLOCK



P.N.	DESCR.
TS212	4 Cond.

TELEPHONE HANDSET AMPLIFIER

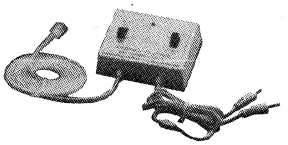


P.N.	DESCR.
T012	4 Cond.

LINE TESTER

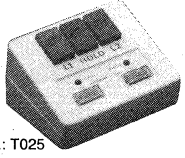
P.N.	DESCR.
T013	4 Cond.

AUTO TEL. RECORDER



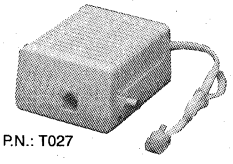
P.N.	DESCR.
T015	4 Cond.

TWO LINE HOLDER



P.N.: T025

ADJUSTABLE RINGER



P.N.: T027

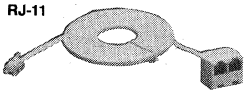
EXTENSION CORD

RJ-11

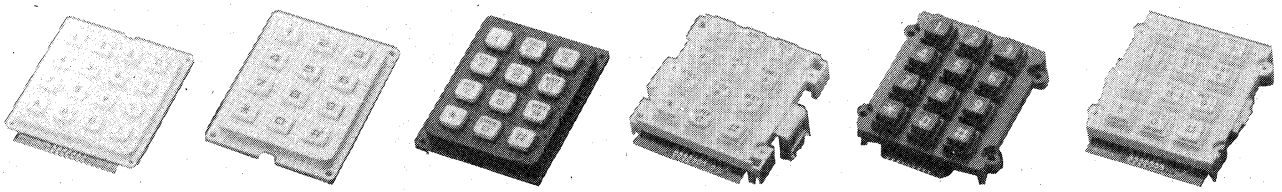
P.N.		DESCR.
TC615	4 Cond.	15 ft.
TC625	4 Cond.	25 ft.

DUPLEX EXTENSION CORD

RJ-11



P.N.		DESCR.
TC515	4 Cond.	15 ft.
TC525	4 Cond.	25 ft.

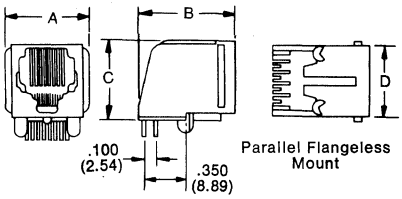


REFER TO EEM PAGE B•1875 FOR A COMPLETE LINE OF STANDARD KEYPADS.

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

MODULAR TELEPHONE CONNECTORS

Parallel Flangeless Mount

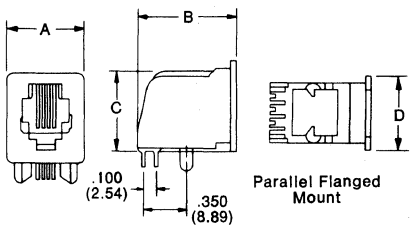


Parallel Flangeless Mount

Model	No. of Position	No. of Contacts	Dimensions inch mm A	B	C	D
LZ249-4	4	4	.540 13.72	.810 20.57	.630 16	.440 11.18
LZ250-4	6	4	.620 15.75	.810 20.57	.630 16	.520 13.51
LZ250-6	6	6	.620 15.75	.810 20.57	.630 16	.520 15.24
LZ251-6	8	6	.700 17.78	.810 20.57	.630 16	.600 15.24
LZ251-8	8	8	.700 17.78	.810 20.57	.630 16	.600 15.24
LZ252-6	8K†	6	.700 17.78	.810 20.57	.630 16	.600 15.24
LZ252-8	8K†	8	.700 17.78	.810 20.57	.630 16	.600 15.24

† Keyed

Parallel Flanged Mount

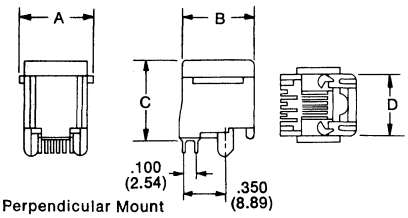


Parallel Flanged Mount

Model	No. of Position	No. of Contacts	Dimensions inch mm A	B	C	D
LZ241-4	4	4	.570 14.48	.810 20.57	.680 17.27	.440 11.18
LZ242-4	6	4	.650 16.51	.810 20.57	.680 17.27	.520 13.21
LZ242-6	6	6	.650 16.51	.810 20.57	.680 17.27	.520 13.21
LZ243-6	8	6	.730 18.54	.810 20.57	.680 17.27	.600 15.24
LZ243-8	8	8	.730 18.54	.810 20.57	.680 17.27	.600 15.24
LZ244-6	8K†	6	.730 18.54	.810 20.57	.680 17.27	.600 15.24
LZ244-8	8K†	8	.730 18.54	.810 20.57	.680 17.27	.600 15.24

† Keyed

Perpendicular Mount



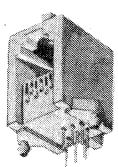
Perpendicular Mount

Model	No. of Position	No. of Contacts	Dimensions inch mm A	B	C	D
LZ257-4	4	4	.550 13.97	.625 15.88	.645 16.38	.450 11.43
LZ258-4	6	4	.630 16	.625 15.88	.645 16.38	.530 13.46
LZ258-6	6	6	.630 16	.625 15.88	.645 16.38	.530 13.46
LZ259-6	8	6	.710 18.03	.625 15.88	.645 16.38	.610 15.49
LZ259-8	8	8	.710 18.03	.625 15.88	.645 16.38	.610 15.49
LZ260-6	8K†	6	.710 18.03	.625 15.88	.645 16.38	.610 15.49
LZ260-8	8K†	8	.710 18.03	.625 15.88	.645 16.38	.610 15.49

† Keyed

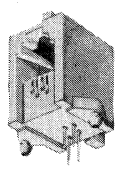
PCB Mount
6 Positions

Model	Desc.
623TYPE4C	6P4C
623TYPE6C	6P6C



PCB Mount
4 Positions

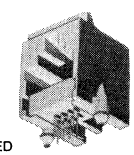
Model	Desc.
616TYPE4C	4P4C



PCB Mount
8 Positions

optional industry standard polarization

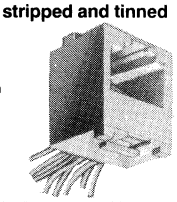
Model	Desc.
641TYPE	8P8C
641TYPEK	8P8C, KEYED



7″ Wire Leads, stripped and tinned
8 Positions

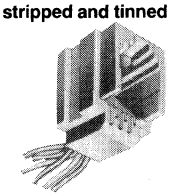
optional industry standard polarization

Model	Desc.
641D	8P8C
641DK	8P8C, KEYED



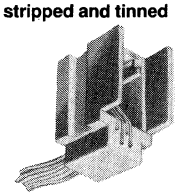
7″ Wire Leads, stripped and tinned
6 Positions

Model	Desc.
623K4C	6P4C
623K6C	6P6C



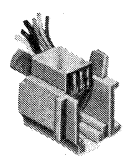
7″ Wire Leads, stripped and tinned
4 Positions

Model	Desc.
616M4C	4P4C



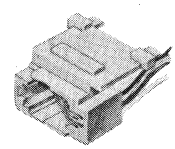
7″ Wire Leads, stripped and tinned
6 Positions

Model	Desc.
623T4C	6P4C
623T6C	6P6C



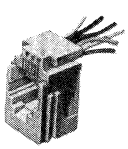
7″ Wire Leads, stripped and tinned
4 Positions

Model	Desc.
616T4C	4P4C



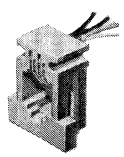
7″ Wire Leads, stripped and tinned
6 Positions

Model	Desc.
623P4C	6P4C
623P6C	6P6C



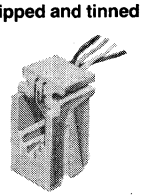
7″ Wire Leads, stripped and tinned
4 Positions

Model	Desc.
616B4C	4P4C



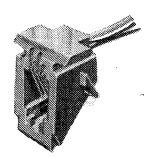
7″ Wire Leads, stripped and tinned
4 Positions

Model	Desc.
616P4C	4P4C



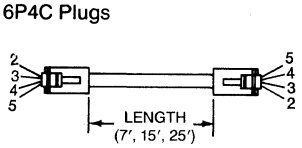
7″ Wire Leads, stripped and tinned
4 Positions

Model	Desc.
616W4C	4P4C

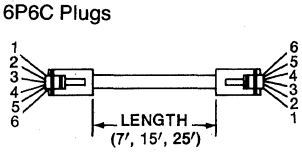


TELEPHONE LINE CORDS AND COILED CORDS

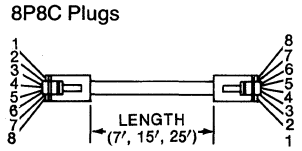
6P4C Plugs



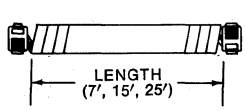
6P6C Plugs



8P8C Plugs



Coiled Cord



Custom Color, Custom Length and Cords to your own specification are welcome. Please call our sales office.

For Further Information on Telephone Line Cords refer to EEM page C•1869

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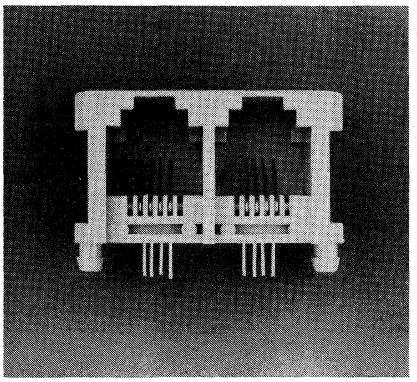
Telephone (301)921-9440 Fax (301)670-0436

MULTI-PORT RJ-11C



LOW PROFILE, PCB MOUNT

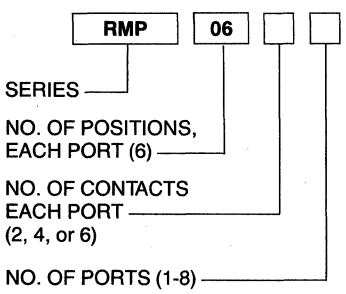
1-8 PORTS

6-POSITION CONNECTORS, WITH 2, 4, OR 6 CONTACTS EACH.

Compare to using multiple individual connectors in your designs—

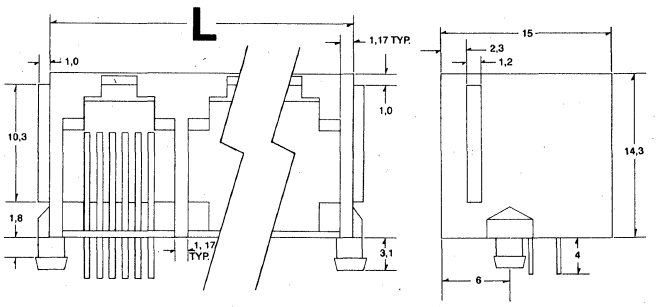
- SAVES valuable PCB real estate.
- SAVES assembly time.
- SAVES on bracket/panel fabrication—requires only one opening. Looks more professional, too!

PART NUMBER GUIDE

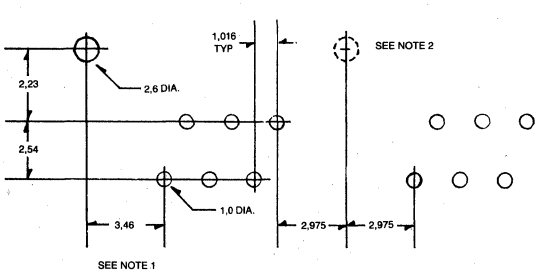


PORTS	1	2	3	4	5	6	7	8
DIM. "L"	12,20	23,23	34,26	45,29	56,32	67,35	78,38	89,41

All dimensions are in mm.



PCB LAYOUT 6-wire version shown



Notes: 1) All Multi-port connector blocks have locking tabs at both ends. These provide enhanced PCB mounting stability.
2) The 6- and 8-port versions ahve an aditional locking tab, centered in the middle of the row (between the 3rd and 4th part of 6-port block and between the 4th and 5th part of an 8-port block).

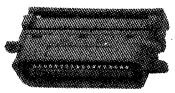
FOR FURTHER INFORMATION, DETAILED SPECIFICATIONS & SAMPLES PLEASE CONTACT OUR SALES OFFICE.

LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

IDC SERIES 57 CONNECTORS FOR FLAT RIBBON CABLE

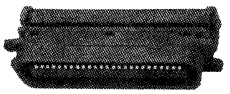
5724 MIDC
24 pos. Male

5724 FIDC
24 pos. Female

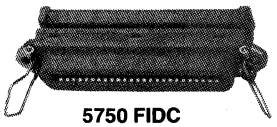


5736 MIDC
36 pos. Male

5736 FIDC
36 pos. Female



5750MIDC
50 pos. Male

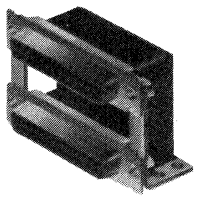


5750 FIDC
50 pos. Female

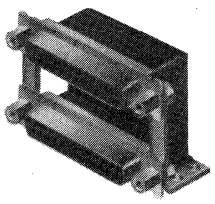
DUAL PORT, DB25 PCB MOUNT CONNECTORS

RECEPTACLE ASSEMBLIES

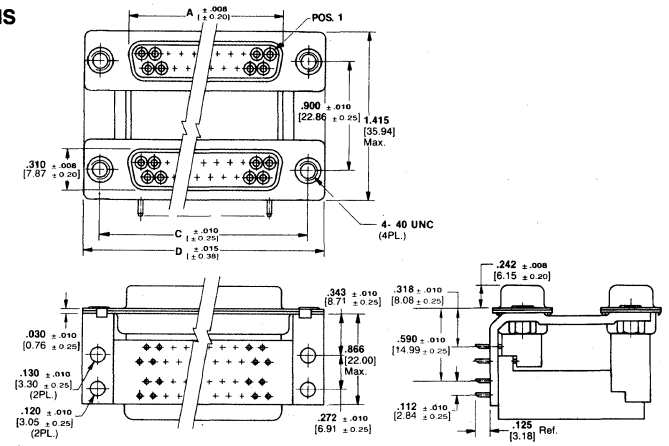
25 POSITIONS
FEMALE
TO FEMALE



-N1
Standard Clinch Nut Assembly



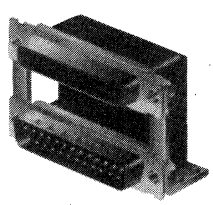
-N2
With Additional Female Screw Lock



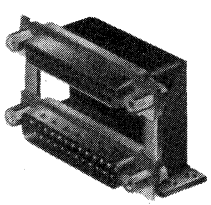
NO. OF CONTACT POSITIONS (SHELL SIZE)	DIMENSIONS A	B	C	D	CONTACT PLATING	P.N. TIN PLATED SHELL
25	1.510 38.36	—	1.852 (47.04)	2.083 (52.91)	A B	DB25FFAN1 DB25FFBN1

RECEPTACLE ASSEMBLIES

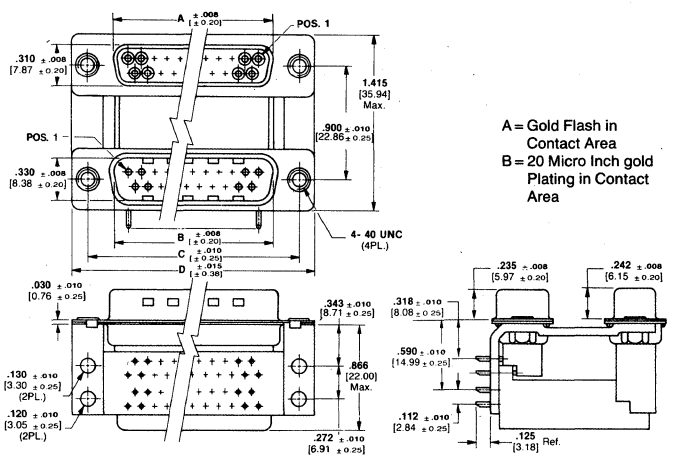
25 POSITIONS
FEMALE TO
MALE



-N1
Standard Clinch Nut Assembly



-N2
With Additional Female Screw Lock



A = Gold Flash in Contact Area
B = 20 Micro Inch gold Plating in Contact Area

NO. OF CONTACT POSITIONS (SHELL SIZE)	DIMENSIONS A	B	C	D	CONTACT PLATING	P.N. TIN PLATED SHELL
25 FEMALE TO MALE	1.510 38.36	1.531 38.89	1.852 47.04	2.083 52.91	A B	DB25FMAN1 DB25FMBN1
25 MALE TO MALE	1.531 38.89	—	1/852 47.04	2.083 52.91	A B	DB25MMAN1 DB25MMBN1
25 MALE TO FEMALE VERSION	1.531 38.89	1.510 38.36	1.852 47.04	2.083 52.91	A B	DB25MFAN1 DB25MFBN1

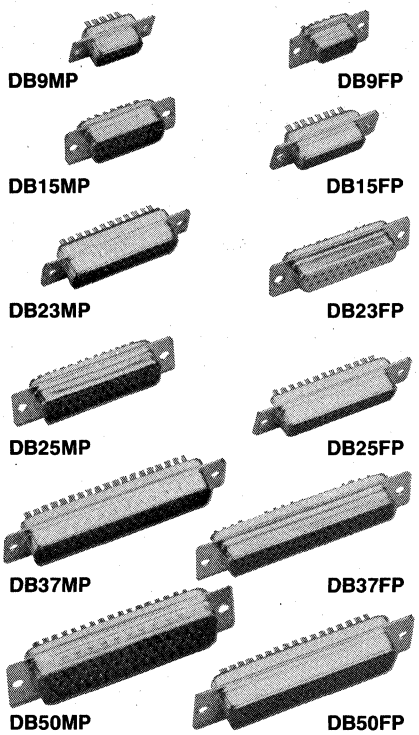
ALSO AVAILABLE IN 9 POS. AND 15 POS. "D" SUB.

LZR electronics, inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

"D"-SUB CONNECTORS

PANEL MOUNT SOLDER CUP

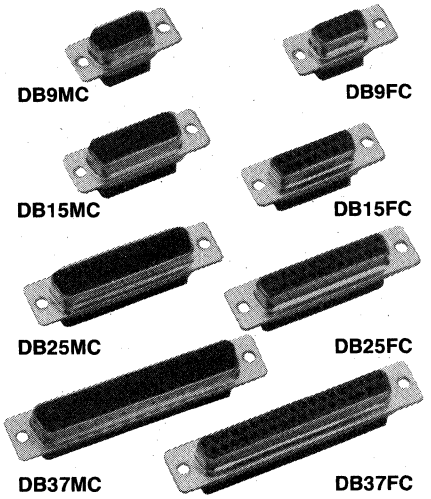
MALE FEMALE



DB9MP DB9FP
DB15MP DB15FP
DB23MP DB23FP
DB25MP DB25FP
DB37MP DB37FP
DB50MP DB50FP

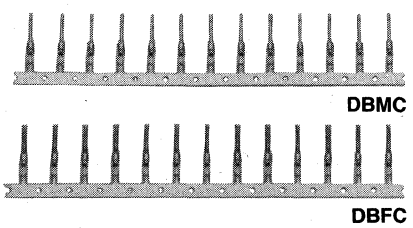
CRIMP TERMINAL HOUSING

MALE FEMALE



DB9MC DB9FC
DB15MC DB15FC
DB25MC DB25FC
DB37MC DB37FC

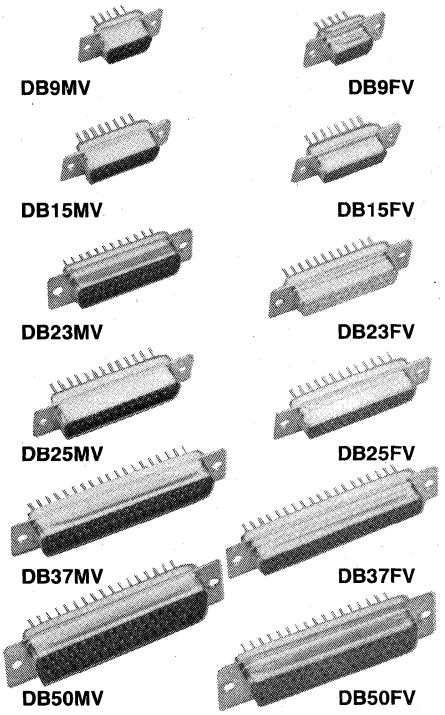
Crimp Terminal:



DBMC
DBFC

PC BOARD VERTICAL MOUNT

MALE FEMALE

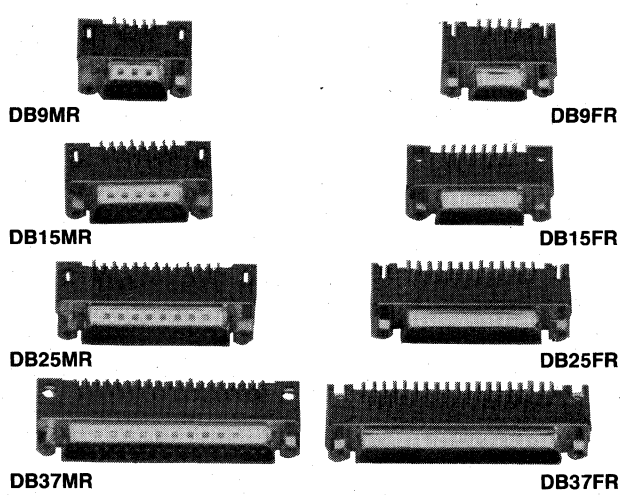


DB9MV DB9FV
DB15MV DB15FV
DB23MV DB23FV
DB25MV DB25FV
DB37MV DB37FV
DB50MV DB50FV

RIGHT ANGLE, PC BOARD MOUNT

SHORT BODY .485"

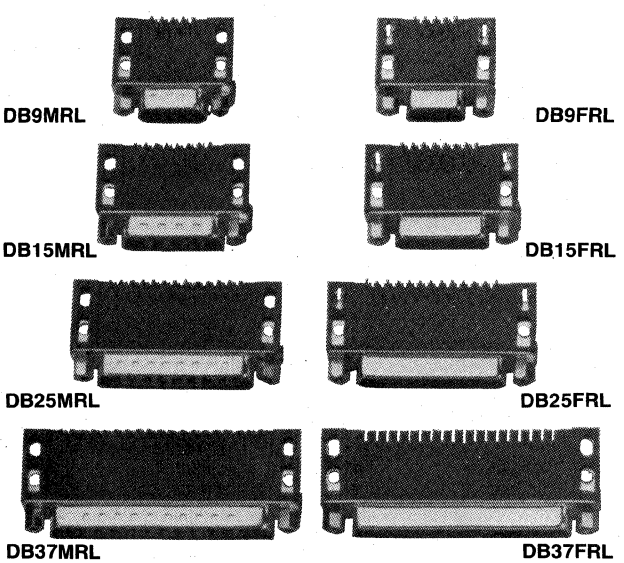
MALE FEMALE



DB9MR DB9FR
DB15MR DB15FR
DB25MR DB25FR
DB37MR DB37FR

LONG BODY 0.75"

MALE FEMALE



DB9MRL DB9FRL
DB15MRL DB15FRL
DB25MRL DB25FRL
DB37MRL DB37FRL

ALL MODELS ARE SUPPLIED WITH HEX JACK SCREWS.
ADD "C" TO PART NO. FOR PCB RETENTION CLIP.
ADD "D" FOR #4-40 THREADED BUSHING FOR PCB SCREW-MOUNTING.

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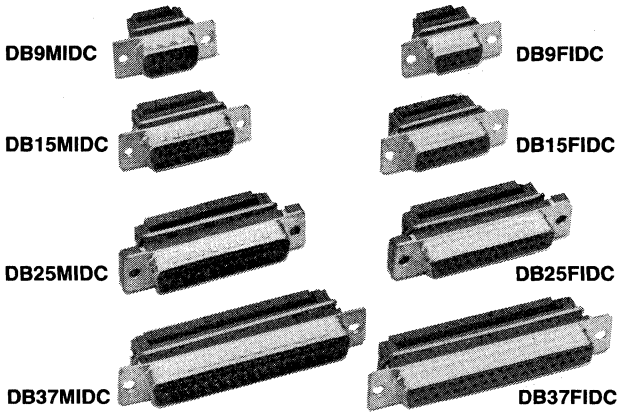
"D"-SUB CONNECTORS

IDC "D" SUB FOR FLAT RIBBON CABLE

METAL SHELL



DB9MIDC DB9FIDC

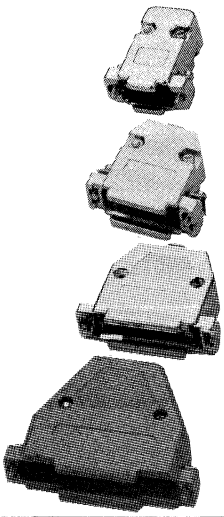
DB15MIDC DB15FIDC

DB25MIDC DB25FIDC

DB37MIDC DB37FIDC

"D"-SUB CONNECTOR HOODS

(Hardware included)



SCPD9PC - 9 pos. Plastic
SCPD9MP - 9 pos. Metalized
SCPD9MC - 9 pos. Metal

SCPD15PC - 15 pos. Plastic
SCPD15MP - 15 pos. Metalized
SCPD15MC - 15 pos. Metal

SCPD25PC - 25 pos. Plastic
SCPD25MP - 25 pos. Metalized
SCPD25MC - 25 pos. Metal

SCPD37PC - 37 pos. Plastic
SCPD37MP - 37 pos. Metalized
SCPD37MC - 37 pos. Metal

HARDWARE FOR "D"-SUB CONNECTORS

021 — #1 Shoulder Screw & Saddle Washer

022 — #2 Shoulder Screw & Saddle Washer

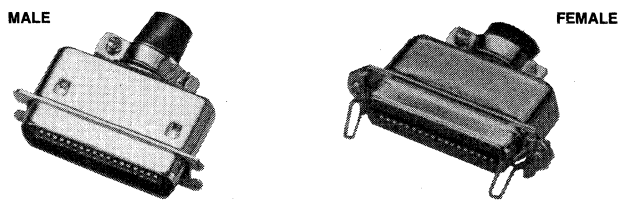
023 — Hex Locking Screw, Flat Washer Split Washer & Nut

025 — #1 Captive Screw & Retaining Clip

SERIES 57 CONNECTORS

FOR ROUND CABLE WITH SOLDER TERMINALS

MALE FEMALE

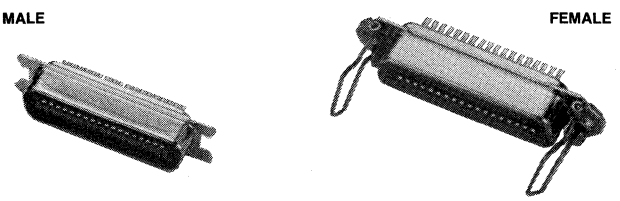


5730 14M-14 pos. Male
5730 24M-24 pos. Male
5730 36M-36 pos. Male
5730 50M-50 pos. Male

5760 14F-14 pos. Female
5760 24F-24 pos. Female
5760 36F-36 pos. Female
5760 50F-50 pos. Female

PANEL MOUNT WITH SOLDER TERMINALS

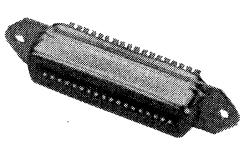
MALE FEMALE



5710 14M-14 pos. Male
5710 24M-24 pos. Male
5710 36M-36 pos. Male
5710 50M-50 pos. Male

5740 14F-14 pos. Female
5740 24F-24 pos. Female
5740 36F-36 pos. Female
5740 50F-50 pos. Female

VERTICAL PC BOARD MOUNT



5715 14M-14 pos. Male
5715 24M-24 pos. Male
5715 36M-36 pos. Male
5715 50M-50 pos. Male

5725 14F-14 pos. Female
5725 24F-24 pos. Female
5725 36F-36 pos. Female
5725 50F-50 pos. Female

RIGHT ANGLE, PC BOARD MOUNT

5755 24M-24 pos. Male
5755 36M-36 pos. Male
5755 50M-50 pos. Male

5745 14F-14 pos. Female
5745 24F-24 pos. Female
5745 36F-36 pos. Female
5745 50F-50 pos. Female

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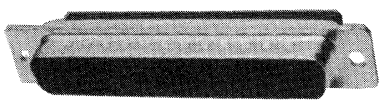
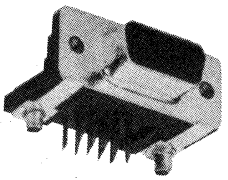
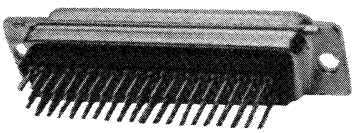
HIGH DENSITY "D" CONNECTORS

Our DH Series connectors are designed to replace D-Subminiature connectors in your designs.

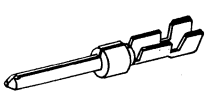
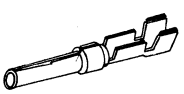
Consider these advantages:

- Average 68% increase in throughput compared to D-Subs of equal sizes.
- Standard D-Sub shell dimensions eliminate costly retooling of panel openings, etc.
- Use standard D-Sub hoods and hardware.

DH Series		Replaces
CONTACTS	ROWS	
15	3	DB9
26	3	DB15
44	3	DB25
62	3	DB37
78	4	DB50
104	5	—

SELECTION GUIDE

	Crimp Housing Male	Crimp Housing Female	Solder Cup Male	Solder Cup Female	PCB Straight Male	PCB Right Angle Female
15 Positions	DH21-015	DH22-015	DH31-015	DH32-015	DH41-015	DH52-015
26 Positions	DH21-026	DH22-026	DH31-026	DH32-026	DH41-026	DH52-026
44 Positions	DH21-044	DH22-044	DH31-044	DH32-044	DH41-044	DH52-044
62 Positions	DH21-062	DH22-062	DH31-062	DH32-062	DH41-062	DH52-062
78 Positions	DH21-078	DH22-078	—	—	DH41-078	DH52-078
104 Positions	DH21-104	DH22-104	—	—	DH41-104	—

CRIMP TERMINALS for DH21/DH22 housings
Male: PART No. DH01-001 Female: PART No. DH02-001
.030" pin diameter
for 24-28AWG wire
with insulation support

SPECIFICATIONS

INSULATOR	Glass-filled thermoplastic, to UL 94V-O
SHELL	Steel, Tin plated (Zinc plating is optional for DH 21,22,41)
CONTACT MATERIAL	Phosphor Bronze (DH02,31,32,52) Brass (DH01,41)
CONTACT PLATING	Gold over Nickel
CURRENT RATING	3 Amps (DH 21,22,41,52) 5 Amps (DH 31,32)
INSULATOR RESISTANCE	1000 MegOhms minimum @ 500VDC
DIELECTRIC STRENGTH	1000V for one minute
TEMPERATURE RANGE	– 55 to + 105 degrees C

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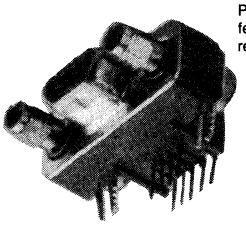
DOUBLE DENSITY "D" CONNECTORS

- Popular "Micro" D format
- Alternate contact row design
- Tight .050" spacing provides twice as many contacts per square inch as D-Subminiatures

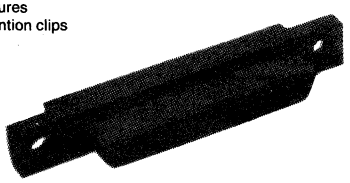
	Crimp Housing*		PCB Right Angle
	Male	Female	Female
9 Positions	DD21-009	DD22-009	DD52-009
15 Positions	DD21-015	DD22-015	DD52-015
21 Positions	DD21-021	DD22-021	—
25 Positions	DD21-025	DD22-025	DD52-025
31 Positions	DD21-031	DD22-031	—
37 Positions	DD21-037	DD22-037	—
51 Positions	DD21-051	DD22-051	—

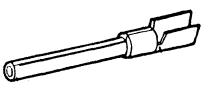
*NOTE:
Our double density D connectors incorporate the standard reversed contact configuration. This provides excellent retention as well as superior protection of the male pin. The "male" housing, DD21, is used with the female DD01 crimp terminal. The "female" housing, DD22, is used with the male DD02 terminal. The PCB right angle female, DD52, is preloaded with DD02 contacts.

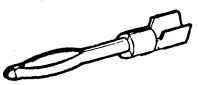
CRIMP TERMINALS for DD21/DD22 housings:
Socket contact, for male DD21 housing Part no. DD02-001
Pin contact, for female DD22 housing Part no. DD01-001
For 26–30 AWG wire, .024" pin diameter



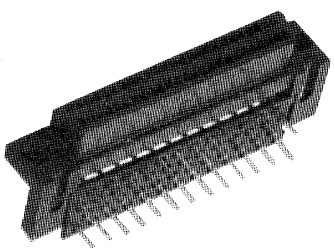
PCB version features retention clips

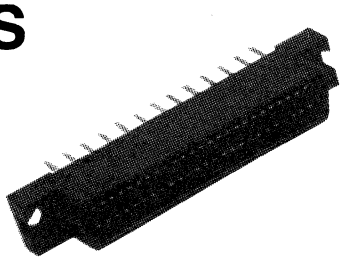






MICRO HEADERS PCB TYPE





	PCB Straight		PCB Right Angle	
	Male	Female	Male	Female
30 Positions	H541-030	H542-030	H551-030	H552-030
40 Positions	H541-040	H542-040	H551-040	H552-040
50 Positions	H541-050	H542-050	H551-050	H552-050
60 Positions	H541-060	H542-060	H551-060	H552-060

Ideal for board-to-board interconnection

- Space-saving .050" contact pitch
- Keystone shell provides polarization
- PCB pins are arranged in four rows for easier track routing

SPECIFICATIONS

INSULATOR	Glass-filled thermoplastic, to UL 94V-O
CONTACT MATERIAL	Phosphor Bronze (H542,52,DD01,52) Brass (H541,51) Beryllium Copper (DD02)
CONTACT PLATING	Gold over Nickel
CURRENT RATING	1 Amp
INSULATOR RESISTANCE	1000 MegOhms minimum @ 500VDC (H5 Series) 5000 MegOhms minimum @ 500VDC (DD Series)
DIELECTRIC STRENGTH	500VAC for one minute (H5 Series)
WITHSTANDING VOLTAGE	800VAC rms (DD Series)
TEMPERATURE RANGE	– 55 to + 105° C

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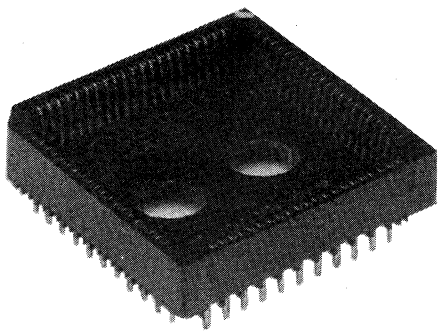
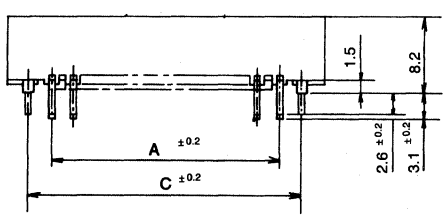
SPA SERIES
LOW PROFILE PLCC SOCKET

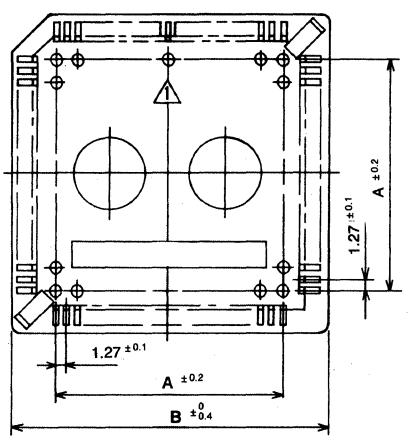


- 68 Pin and 84 Pin versions available.
- Accepts JEDEC Type A components.
- Body design allows easy, thorough cleaning, and good heat dissipation.

PART NO.	CONTACTS	DIM. "A"	DIM. "B"	DIM. "C"
SPA6801T	68	20.32	30.40	25.40
SPA8401T	84	25.40	35.50	30.48

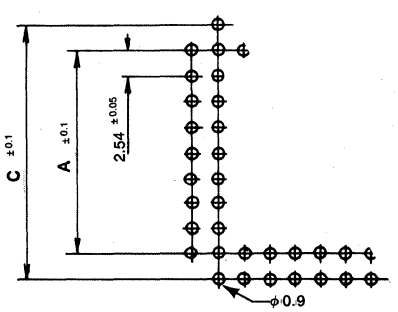
All dimensions in mm





SPECIFICATIONS

CONTACT RESISTANCE	30 milliOhms maximum
INSULATION RESISTANCE	1,000 MegOhms minimum
DIELECTRIC WITHSTANDING	500 VAC minimum
CAPACITANCE	0.5 pF maximum at 1 MHz
BODY MATERIAL	Glass reinforced PPS, UL rated 94V-O, black
CONTACT MATERIAL	Copper alloy
CONTACT PLATING	Tin alloy



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- Single/ganged positions

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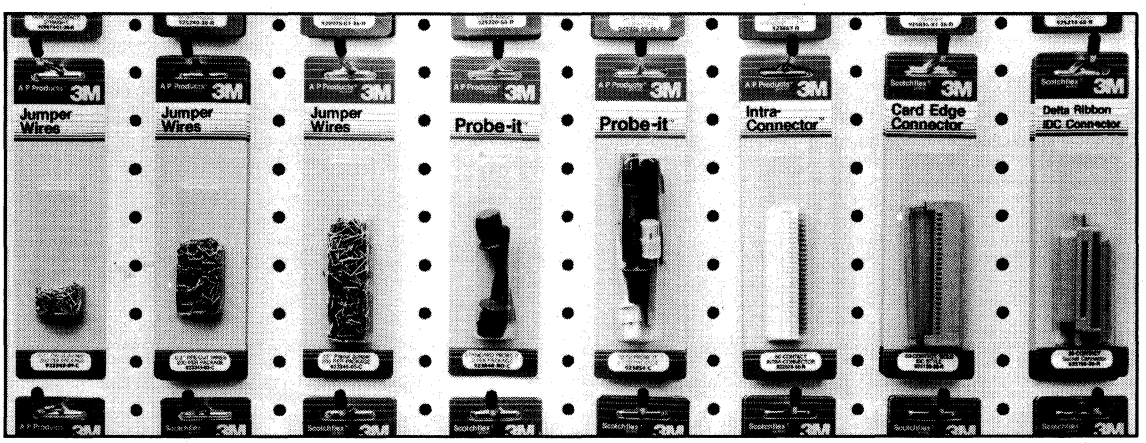

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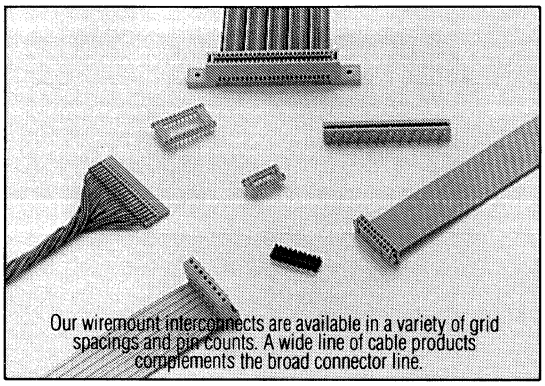
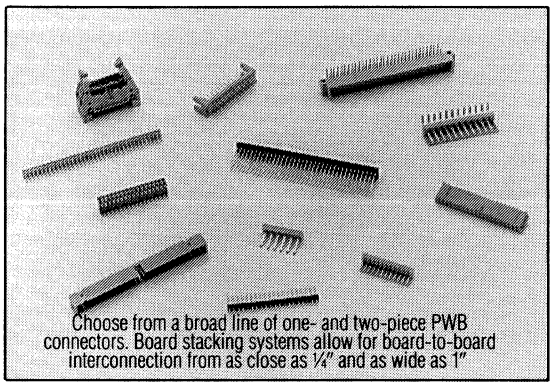
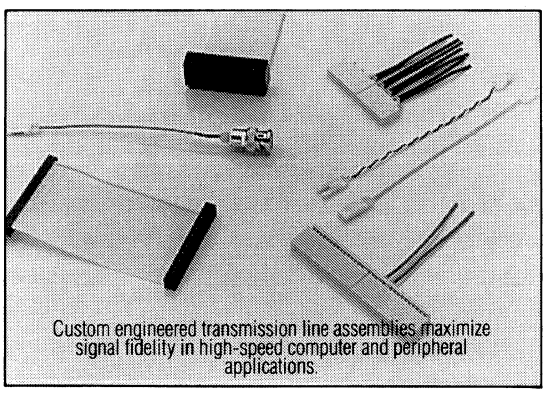


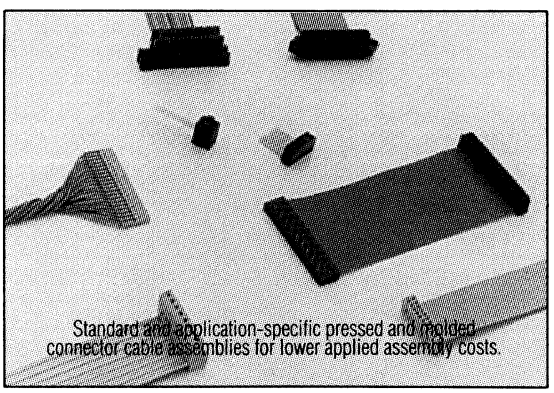
Our wiremount interconnects are available in a variety of grid spacings and pin counts. A wide line of cable products complements the broad connector line.



Choose from a broad line of one- and two-piece PWB connectors. Board stacking systems allow for board-to-board interconnection from as close as ¼" and as wide as 1"



Custom engineered transmission line assemblies maximize signal fidelity in high-speed computer and peripheral applications.



Standard and application-specific pressed and molded connector cable assemblies for lower applied assembly costs.

Now, 3M's broader line of connector/cable products increases your design flexibility with a vast array of interconnection systems, including standard and application-specific products.

- Connector/cable assemblies.
- One-piece molded cable assemblies with built-in strain relief.
- Board Stacking Systems featuring .100" × .100" pitch strip headers with pin lengths of .234", .295" and .318".
- Custom engineered transmission line assemblies for high-speed applications.
- High performance fiber optics interconnects.
- A wide range of wiremount products in a variety of grid spacings and contact materials.
- Choose from sockets, headers, plugs, PCBs, DIPs, card edge connectors, D-Subminiature, Delta Ribbon, DIN and much more.

Our patented "U" contact gives our connectors increased reliability when terminated to flat cable. Our patented L/H contact lowers the insertion force necessary to make a connection while raising retention capability, creating a reliable connection that stands the test of time. All 3M contacts are beryllium copper, phosphor bronze or nickel-silver, with gold or tin alloy plating, for maximum design flexibility. Bodies are made of rugged polyester.

3M Flat Cable is available in 18-30 AWG gauge including shielded and round jacketed versions to complement the connector line.

Our new, broader line of interconnects is supported by 3M's ongoing programs in Just-In-Time Delivery, Statistical Process Control and Order Express℠—our new central ordering system. All to keep in step with our customers' demands for high quality and on-time delivery.

For further information on any 3M product, see your 3M distributor or call our toll-free product information hotline: (800) 328-7732.

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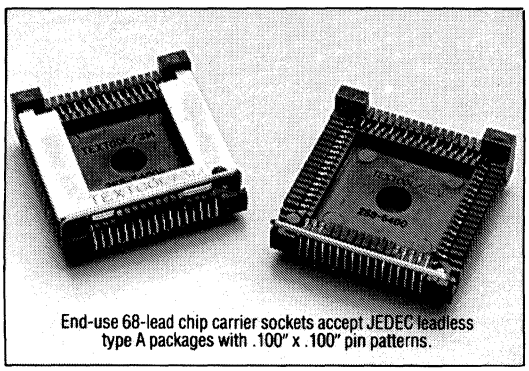
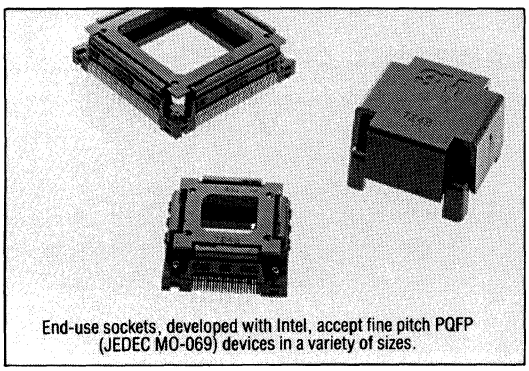
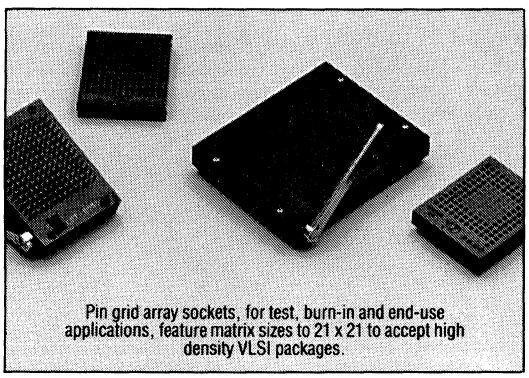
For test, burn-in, production sockets and IC carriers, tough customers turn to 3M.



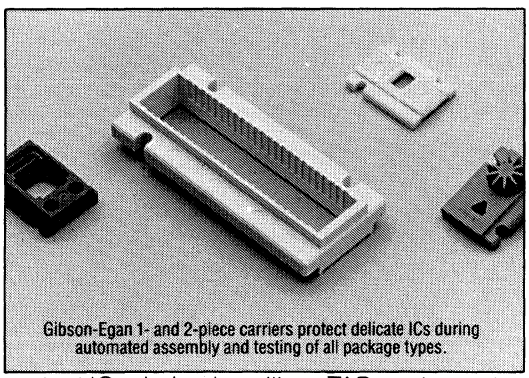
End-use 68-lead chip carrier sockets accept JEDEC leadless type A packages with .100" x .100" pin patterns.



End-use sockets, developed with Intel, accept fine pitch PQFP (JEDEC MO-069) devices in a variety of sizes.



Pin grid array sockets, for test, burn-in and end-use applications, feature matrix sizes to 21 x 21 to accept high density VLSI packages.



Gibson-Egan 1- and 2-piece carriers protect delicate ICs during automated assembly and testing of all package types.

3M makes it easy to get the right IC sockets for your needs with our selection of Textool™ designs for test, burn-in and end-use applications. Sockets accept PQFP, chip carrier, flat pack, pin grid array, DIP and discrete components in a variety of body, contact and plating materials. Our PLCC Quick Lock burn-in sockets maximize board real estate and speed loading and unloading.

ZIF DIP™ end-use DIP sockets are designed for applications requiring field replacement or reprogramming of packages: PROM, EPROM, mobile telephones, PABX equipment, programmable auto horns, robotics and more.

The patented ZIP™ (Zero Insertion Pressure) feature on our pin grid array and ZIF DIP sockets protects expensive leads from damage. The low profile and durable leads of our chip carrier sockets make them ideal for high volume production applications.

We also offer IC carriers for all package types useful in handling and automated assembly and testing. Special antistatic materials protect ICs during handling. TAB carrier and socket configurations are also available.

For further information on Textool products, contact the Textool Test and Interconnect Products Department, P.O. Box 2963, Austin, TX 78769-2963, (512) 984-1800. Or get in touch with the distributor near you. **ARIZONA:** D C ELECTRONICS, 2211 S. 48th St., Suite H, Tempe, AZ 85282, (602) 438-1234; **CALIFORNIA:** D C ELECTRONIC SUPPLY, 1600 Wyatt Drive, #3, Santa Clara, CA 95054, (408) 980-1199; MULVIN & CO., 2414 Foothill Boulevard, La Crescenta, CA 91214, (213) 245-1081; **COLORADO:** ALLIANCE ELECTRONICS COLORADO, INC., 1764 Platte Street, Denver, CO 80202, (303) 433-1648; **FLORIDA:** TECH SALES, INC., 5777 Myerlake Circle, P.O. Box 6260, Clearwater, FL 33518, (800) 237-8931 or (813) 539-7429; **ILLINOIS:** EL/MECH, INC., 8430 Gross Point Road, Skokie, IL 60076, (800) 647-7788 or (312) 967-8530; **MASSACHUSETTS:** VECTOR SALES, 90 Braintree Street, Allston, MA 02134, (617) 893-7780; **NEW JERSEY:** MERIDIAN SUPPLY CO., 2810 Morris Avenue, Union, NJ 07083, (201) 687-6220; **NEW MEXICO:** ALLIANCE ELECTRONICS, 11030 Cochiti S.E., Albuquerque, NM 87123, (505) 292-3360; **TEXAS:** PRIME DISTRIBUTING CO., P.O. Box 946, Allen, TX 75002, (214) 231-0170 or (800) 526-7478; TACTIC ELECTRONICS, INC., 1111 Jupiter Road North, Suite A-106, Plano, TX 75074, (214) 422-0777 or (800) 626-2183 (outside Texas); **WASHINGTON:** BLAIR HIRSH COMPANY, INC., P.O. Box 2250, Lynnwood, WA 98036, (206) 774-8151.

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(919) 872-0712
OHIO
Columbus/Electronics
Marketing Corp.
(614) 299-4161
Dayton/Electronics Marketing Corp.
(513) 439-4711
Dayton/Scotts-Friedman
(513) 298-5555
Highland Heights/Electronics
Marketing Corp.
(216) 442-3441
Solon/Hall-Mark
(216) 349-4632
Worthington/Hall-Mark
(614) 888-3313
OKLAHOMA
Tulsa/Hall-Mark
(918) 254-6110
Tulsa/Norvell Electronics, Inc.
(918) 663-1247
OREGON
Beaverton/Acacia/VWR Electronics
(503) 646-3377
Beaverton/Shelley-Ragon, Inc.
(503) 641-1691
Tualatin/Moore Electronics
(503) 692-5333
PENNSYLVANIA
Malvern/Transtek Industries, Inc.
(215) 296-4400
Philadelphia/Powell Electronics
(215) 365-1900
TEXAS
Austin/Hall-Mark
(512) 258-8848
Austin/Kent Electronics
(512) 834-1900
Austin/Norvell Electronics, Inc.
(512) 837-5555
Dallas/Hall-Mark
(214) 553-4300
Dallas/Norvell Electronics, Inc.
(214) 233-0020
El Paso/ ERA Electronics
(915) 855-3600
Houston/Hall-Mark
(713) 781-6100
Houston/Kent Electronics
(713) 780-7770
Houston/Norvell Electronics, Inc.
(713) 777-1666
Plano/Tactic Electronics, Inc.
(214) 422-0777
(800) 345-6005 (Intrastate)
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(804) 499-3322
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(206) 251-0700
WISCONSIN
Milwaukee/Electronic
Expeditors, Inc.
(414) 228-8100
New Berlin/Hall-Mark
(414) 797-7844

3M

METUCHEN CAPACITORS INC.

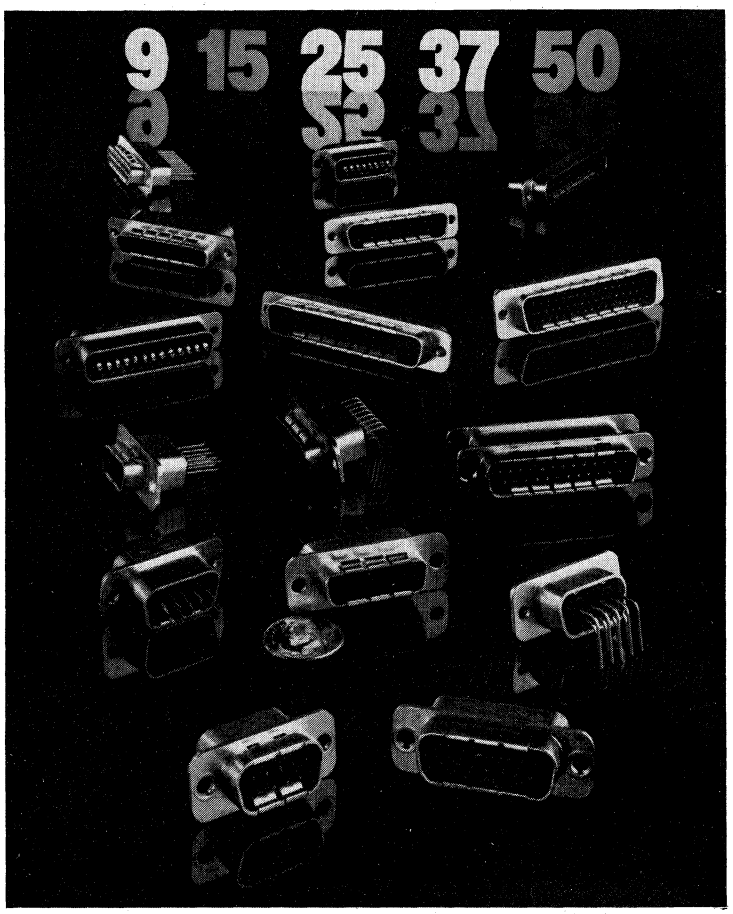
EMI Filtered D Subminiature Connectors

PRODUCT BENEFITS

- Provides optimum positioning of interference control at interconnect interface.
- Provides maximum volumetric efficiency.
- Design is based on proprietary ceramic technology of proven reliability and RF performance.
- Connectors mount in existing chassis hole pattern.
- A cost effective solution to electromagnetic compatibility (EMC).
- Provides a wide range of filter performance options.
- Adaptor styles provide for ease of retrofitting existing equipment.
- Testing 100% for key parameters ensures quality levels.
- Designed to provide compatibility with EIA RS-232 and RS-449.

M.C.I. has the world's largest inventory of filtered D-Subminiature connectors. These connectors are manufactured by the leader of the industry... Spectrum Control, Inc. Spectrum Control's Filtered D Subminiature connectors are designed to provide a cost effective method of complying with FCC Part 15, Sub Part J, VDE and MIL STD 461 A/B regulations. The filters are feed-thru capacitors and pi sections.

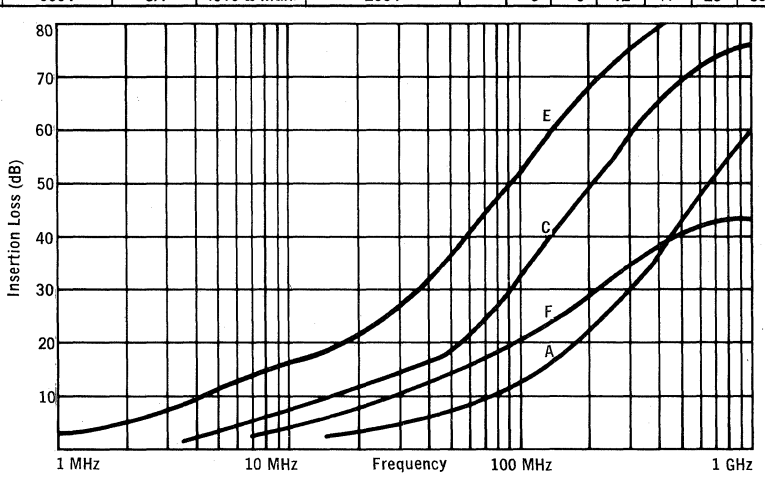
Our in-house stock includes all five shell sizes, 9, 15, 25, 37 and 50 position connectors in pin contacts (plugs), socket contacts (receptacles) and in the very versatile pin/socket adaptors. The four standard electrical configurations along with their performance values follows:



EMI FILTER PERFORMANCE

Filter Designation	*Filter Circuits	Capacitance		3 dB Max Cut-Off Frequency (MHz)	Dielectric W'Standing Voltage	Contact Rating	Contact Resist.	DC Working Voltage	Minimum Insertion Loss — Decibels (dB)						
		Value	Tolerance					−55°C to +125°C	5 MHz	10 MHz	20 MHz	50 MHz	100 MHz	200 MHz	500 MHz	1 GHz
A	Pi	310 pF	±20%	17	300V	5A	.010 Ω Max.	100V	—	—	—	5	10	18	39	52
C	Pi	1000 pF	+100 −0%	3.2	300V	5A	.010 Ω Max.	100V	—	5	9	15	25	43	65	70
E	Pi	4000 pF	+100 −0%	0.8	150V	5A	.010 Ω Max.	50V	8	13	18	31	46	60	75	75
F	FT	830 pF	±20%	6.4	600V	5A	.010 Ω Max.	200V	—	3	6	12	17	23	30	35

TYPICAL PI FILTER AND FEED THROUGH CAPACITOR PERFORMANCE*



The following pages depict HM RS-232 series (shell size 25)

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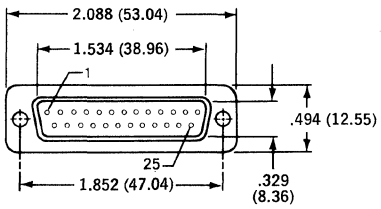
METUCHEN CAPACITORS INC.

EMI Filtered D Subminiature Connectors: 25 Pin Plug

PIN CONTACT (PLUG)

FRONT VIEW
(All Configurations)

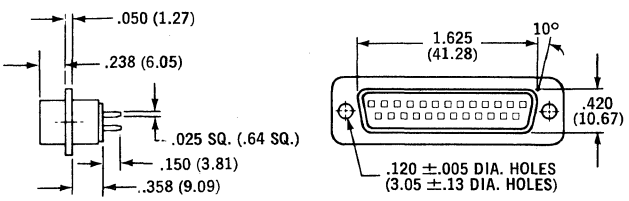


MOUNTING OPTIONS
THREADED SELF-LOCKING INSERTS

Self-locking, threaded and soldered #4-40 UNC inserts available for all connectors and adaptors. Allows ease in fastening and mounting from pin or socket side. Ordering information adding L.I. for Locking Inserts to end of Part Number (eS-56-725-005LI).

Dimensions Shown in Inches (mm)

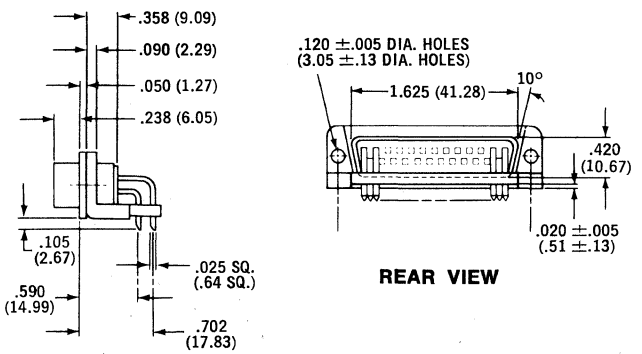
PRINTED CIRCUIT BOARD MOUNT



REAR VIEW

Part Number	EMI Filter			Voltage Rating
	Type*	Cap Value	Lines Filtered	
56-721-001	A	310 pF Pi	25	100 VDC
56-721-003	C	1000 pF Pi	25	100 VDC
56-721-005	E	4000 pF Pi	25	50 VDC
56-721-033	F	830 pF FT	25	200 VDC

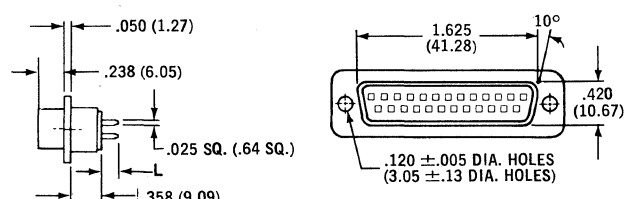
PRINTED CIRCUIT RIGHT ANGLE MOUNT



REAR VIEW

Part Number	EMI Filter			Voltage Rating
	Type*	Cap Value	Lines Filtered	
56-722-001	A	310 pF Pi	25	100 VDC
56-722-003	C	1000 pF Pi	25	100 VDC
56-722-005	E	4000 pF Pi	25	50 VDC
56-722-008	F	830 pF FT	25	200 VDC

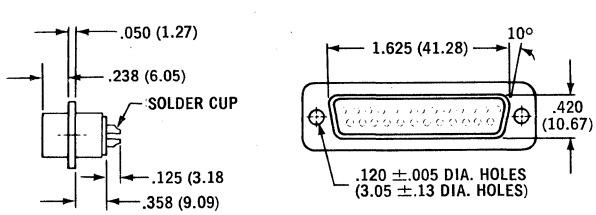
SOLDERLESS WIRE WRAP



REAR VIEW

Part Number	L .500	L .375	L .225	EMI Filter			Voltage Rating
				Type*	Cap Value	Lines Filtered	
56-721-	006	028	024	A	310 pF Pi	25	100 VDC
56-721-	008	030	026	C	1000 pF Pi	25	100 VDC
56-721-	010	032	027	E	4000 pF Pi	25	50 VDC
56-721-	042	039	036	F	830 pF FT	25	200 VDC

SOLDER CUP TERMINATION



REAR VIEW

Part Number	EMI Filter			Voltage Rating
	Type*	Cap Value	Lines Filtered	
56-721-011	A	310 pF Pi	25	100 VDC
56-721-013	C	1000 pF Pi	25	100 VDC
56-721-015	E	4000 pF Pi	25	50 VDC
56-721-045	F	830 pF FT	25	200 VDC

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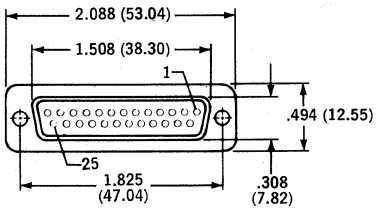
METUCHEN CAPACITORS INC.

EMI Filtered D Subminiature Connectors: 25 Socket Receptacle

SOCKET CONTACT (RECEPTACLE)

FRONT VIEW (All Configurations)

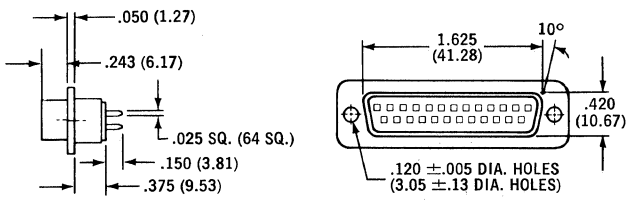


MOUNTING OPTIONS
THREADED SELF-LOCKING INSERTS

Self-locking, threaded and soldered #4-40 UNC inserts available for all connectors and adaptors. Allows ease in fastening and mounting from pin or socket side. Ordering information adding L.I. for Locking Inserts to end of Part Number (eS-56-725-005LI).

Dimensions Shown in Inches (mm)

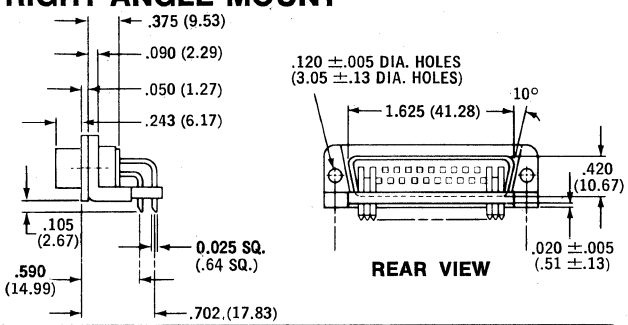
PRINTED CIRCUIT BOARD MOUNT



REAR VIEW

Part Number	EMI Filter			Voltage Rating
	Type*	Cap Value	Lines Filtered	
56-723-001	A	310 pF Pi	25	100 VDC
56-723-003	C	1000 pF Pi	25	100 VDC
56-723-005	E	4000 pF Pi	25	50 VDC
56-723-023	F	830 pF FT	25	200 VDC

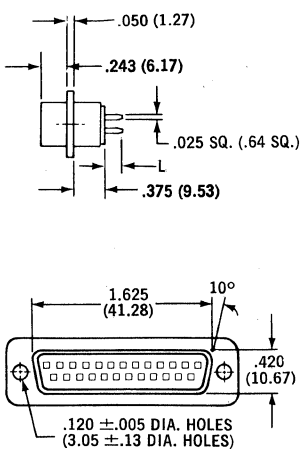
PRINTED CIRCUIT RIGHT ANGLE MOUNT



REAR VIEW

Part Number	EMI Filter			Voltage Rating
	Type*	Cap Value	Lines Filtered	
56-724-001	A	310 pF Pi	25	100 VDC
56-724-003	C	1000 pF Pi	25	100 VDC
56-724-005	E	4000 pF Pi	25	50 VDC
56-724-008	F	830 pF FT	25	200 VDC

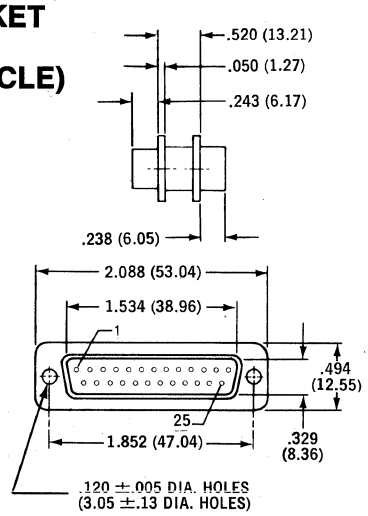
SOLDERLESS WIRE WRAP



REAR VIEW

Part Number	L .500	L .375	L .250	EMI Filter			Voltage Rating
				Type*	Cap Value	Lines Filtered	
56-723-	006	017	012	A	310 pF Pi	25	100 VDC
56-723-	008	019	014	C	1000 pF Pi	25	100 VDC
56-723-	010	021	016	E	4000 pF Pi	25	50 VDC
56-723-	032	029	026	F	830 pF FT	25	200 VDC

EMI FILTERED CONNECTOR ADAPTOR: PIN/SOCKET (PLUG/ RECEPTACLE)



Part Number	EMI Filter			Voltage Rating
	Type*	Cap Value	Lines Filtered	
56-725-001	A	310 pF Pi	25	100 VDC
56-725-003	C	1000 pF Pi	25	100 VDC
56-725-005	E	4000 pF Pi	25	50 VDC
56-725-019	F	830 pF FT	25	200 VDC

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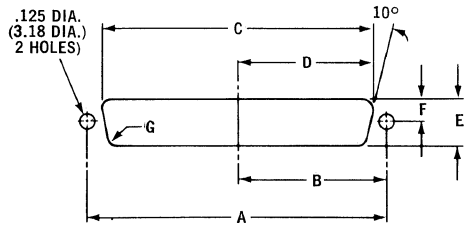
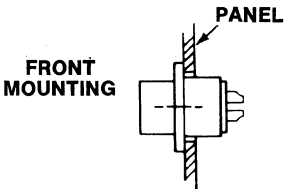
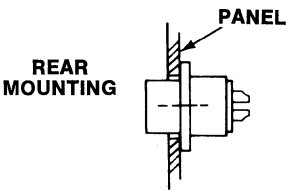
METUCHEN CAPACITORS INC.

Application Notes

25 D SUBMINIATURE PANEL CUTOUTS





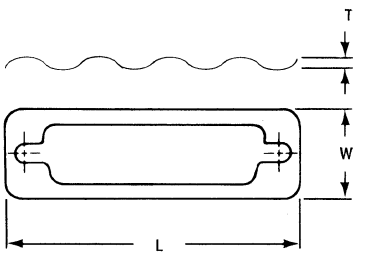


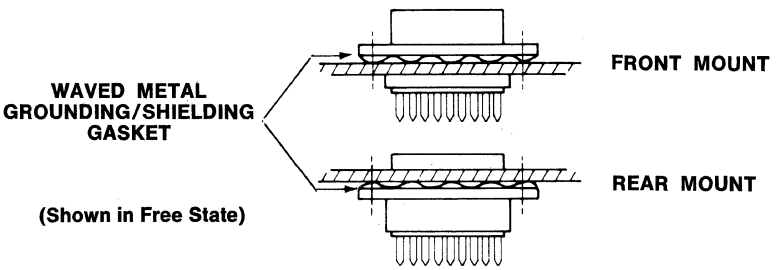
Mounting Method*	A ±.005 (0,13)	B ±.005 (0,13)	C ±.005 (0,13)	D ±.005 (0,13)	E ±.005 (0,13)	F ±.005 (0,13)	G ±.002 (0,05)
Front Mounting	1.852 (47,04)	.926 (23,52)	1.645 (41,78)	.822 (20,89)	.440 (11,18)	.220 (5,59)	.150 (3,81)
Rear Mounting	1.852 (47,04)	.926 (23,52)	1.528 (38,81)	.764 (19,41)	.360 (9,14)	.180 (4,57)	.110 (2,79)

* When Rear Mounting Pin (Plug) Connector use Front Mounting Panel Cutout.

Mounting Considerations Waved Metal Gaskets...For Complete EMI Protection

Proper mounting of any EMI filter — including the EMI filtered D Subminiature — is critical to the achievement of electromagnetic compatibility. The mounting surface for grounding the connector must be free from paint or any other insulating material. The sketches below indicate the use of one of Spectrum's EMI gaskets to fill any tolerance gaps and adjust for irregularities in the flatness of the mounting surface.



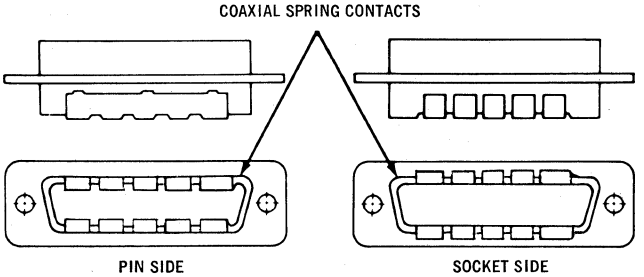


Shell Size	Mounting Configuration	L	W	T Free State	T Compressed	Part No.
25	Front Pin - Socket	2.088 (53,04)	.600 (15,24)	.030 (0,76)	.005 (0,13)	572019-00102-70
	Rear - Pin					
	Rear - Socket	2.088 (53,04)	.600 (15,24)	.030 (0,76)	.005 (0,13)	572019-00107-70

Spectrum EMI Filtered D Subminiature...Unique

Spectrum D subminiature connectors feature a unique ground plane to effectively block bulkhead leakage of EMI. The design also provides line to line isolation separation to limit cross talk (line to line mutual coupling) to an absolute minimum. Another, and a most important feature, is the coaxial spring contact that provides proper electrical grounding when mating one connector to another connector.

R. F. GROUNDING SPRING CONTACT*



* Provided on all shell sizes — all termination styles Patent Pending.

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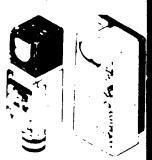
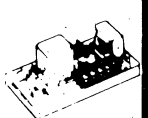
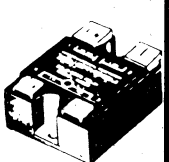
TOGGLE SWITCHES

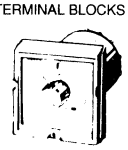

PHOTOELECTRICS

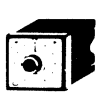
RELAYS


LIQUID LEVEL CONTROLS


SOLID STATE RELAYS

TERMINAL BLOCKS


TEMPERATURE CONTROLS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Iboco
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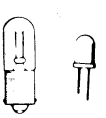
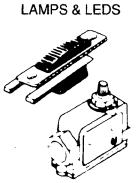
CIRCUIT BREAKERS FUSES & FUSEHOLDERS

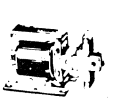
KNOBS


LAMPS & LEDS


SWITCHES

RELAYS

INDICATOR LIGHTS


SOLENOIDS

SOCKETS

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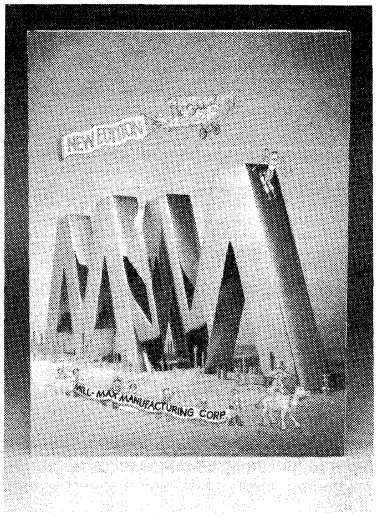
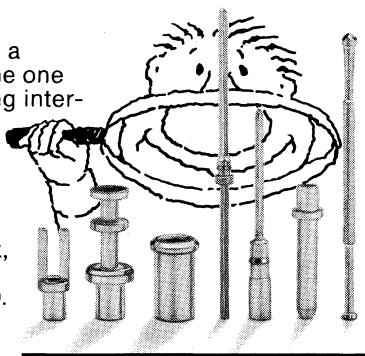


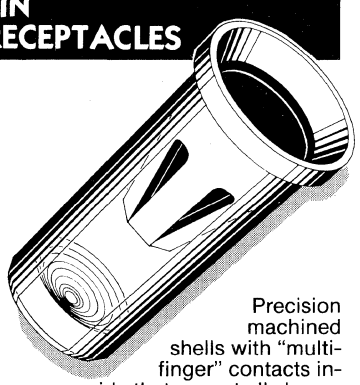
PIN POINT THE RIGHT PIN RIGHT AWAY WITH A FREE MILL-MAX® CATALOG

Tired of hunting down parts through a clutter of catalogs? Then discover the one that takes the intrigue out of selecting interconnect components. The Mill-Max catalog. Buried beneath its covers are hundreds of parts — all neatly organized with drawings as vivid as a good set of fingerprints.

For your **free** copy, write to Mill-Max, 190 Pine Hollow Road, Oyster Bay, New York 11771 or call **516-922-6000**.



PIN RECEPTACLES

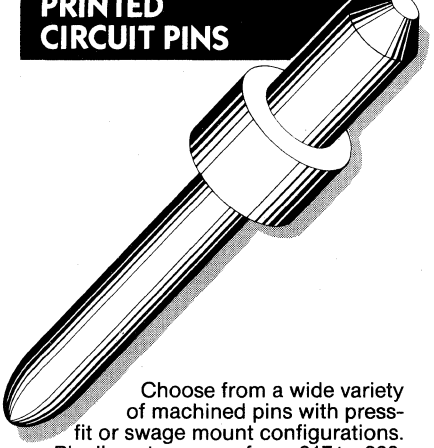


Precision machined shells with "multi-finger" contacts inside that accept all shapes and sizes of pins and component leads. Hundreds of styles available for pin diameters from .010 to .100.

WRAPOST RECEPTACLES

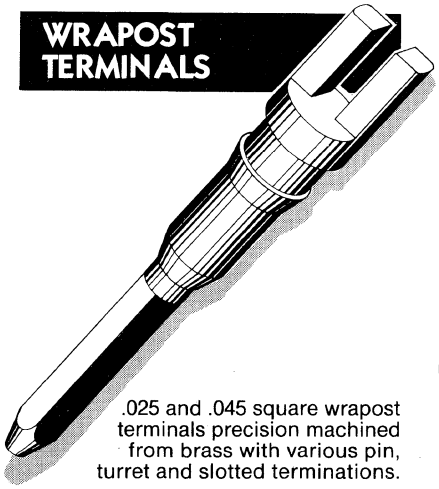
Mill-Max offers a choice of .025 and .045 square wrapost terminals combined with pin receptacles that feature versatile "multi-finger" contacts inside.

PRINTED CIRCUIT PINS



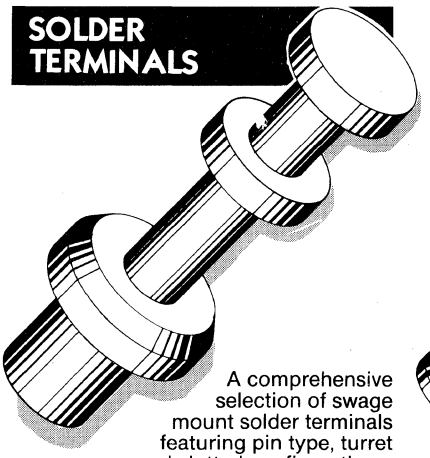
Choose from a wide variety of machined pins with press-fit or swage mount configurations. Pin diameters range from .017 to .080.

WRAPOST TERMINALS



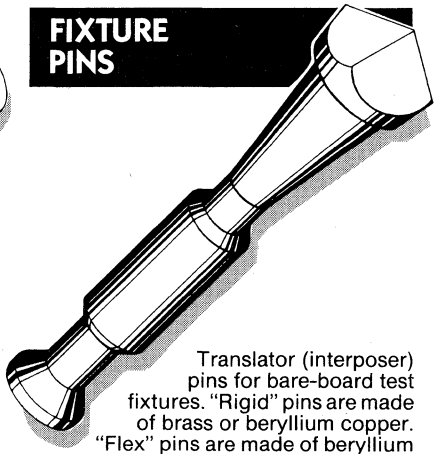
.025 and .045 square wrapost terminals precision machined from brass with various pin, turret and slotted terminations.

SOLDER TERMINALS



A comprehensive selection of swage mount solder terminals featuring pin type, turret and slotted configurations.

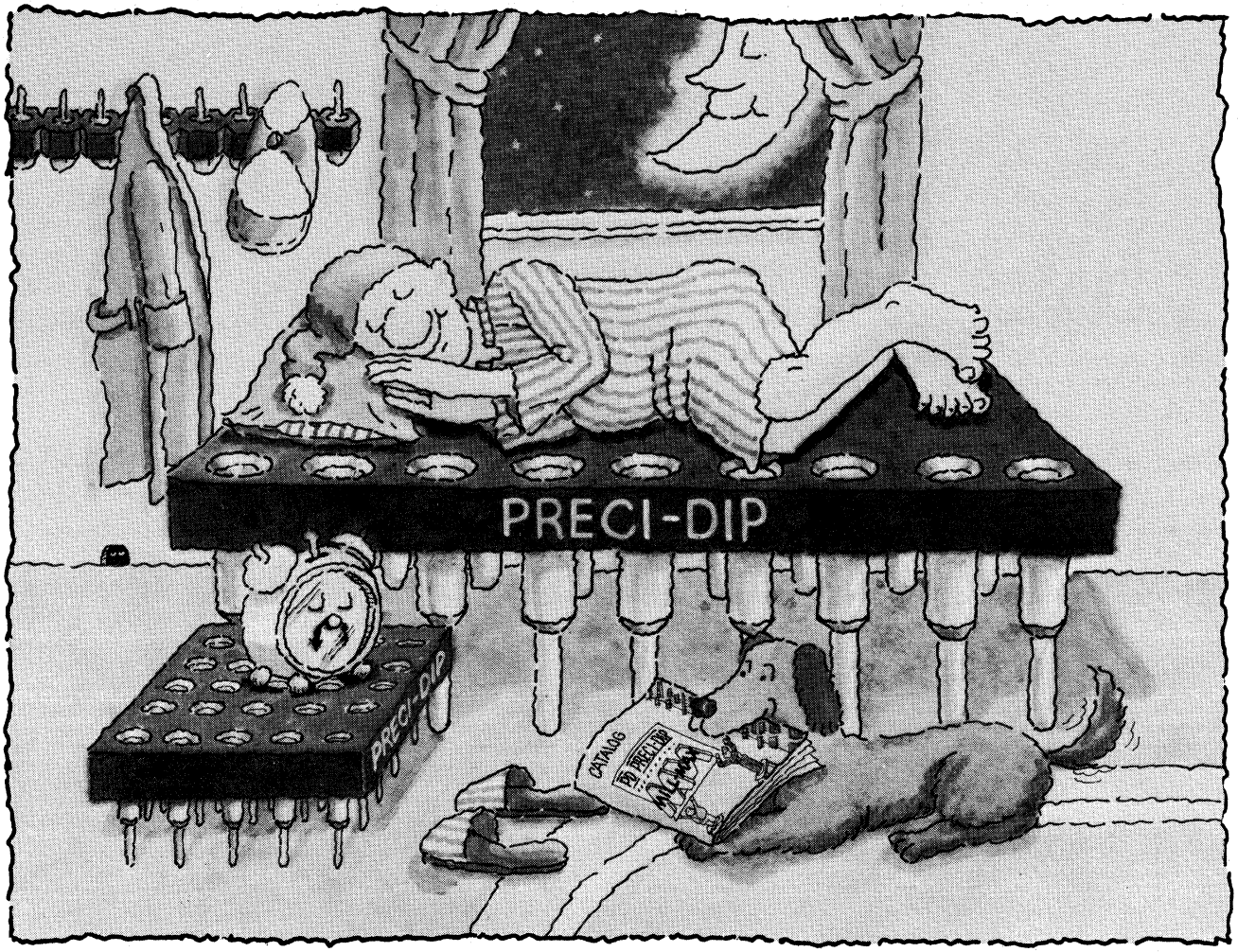
FIXTURE PINS



Translator (interposer) pins for bare-board test fixtures. "Rigid" pins are made of brass or beryllium copper. "Flex" pins are made of beryllium copper, in a variety of head geometries.

MILL-MAX®

TAKING THE LEAD



YOU CAN REST EASY WITH PRECI-DIP AND EURODIP CONNECTORS FROM MILL-MAX.

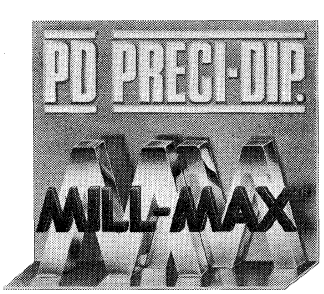
A new day is dawning: engineers and buyers can now start each day knowing their I.C. socket needs are covered like a blanket.

Because Mill-Max® is now your source for Preci-Dip® and EuroDip® brand I.C. sockets and connectors. There's peace of mind in dealing with Mill-Max. As America's leading manufacturer of machined interconnect components, you can rely on Mill-Max for its highly efficient U.S. manufacturing facility, strict process control and large stock inventory.

Our Preci-Dip and EuroDip brand I.C. sockets and connectors feature precision machined pins with "multi-finger" contacts for a High Rel connection that cradles semiconductors snugly, yet allows for easy insertion and extraction.

EuroDip
A division of **Mill-Max®**

Looking for standard catalog and custom connectors at competitive prices that are real eye openers? Then sleep on it tonight and call Mill-Max, or your local Mill-Max/Preci-Dip distributor, in the morning.



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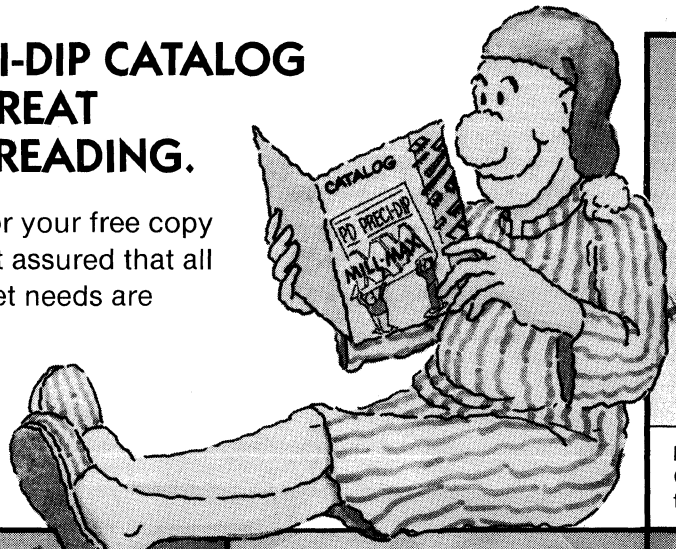
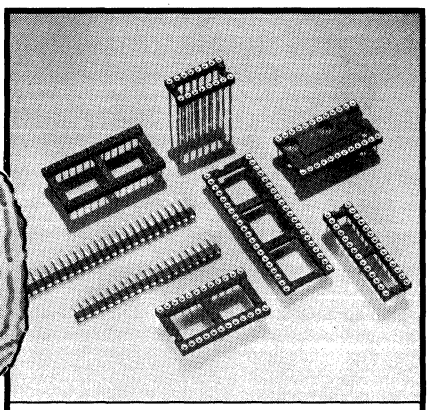
TAKING THE LEAD

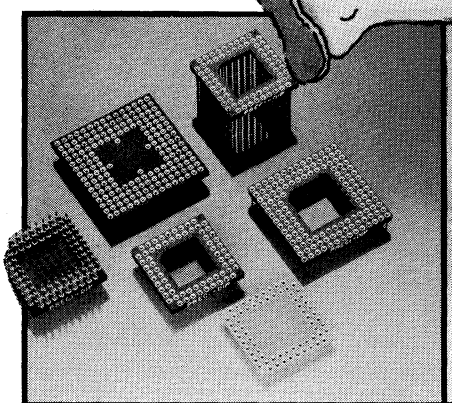
THE PRECI-DIP CATALOG MAKES GREAT BEDTIME READING.

Call or write for your free copy today, and rest assured that all your I.C. socket needs are covered like a blanket.

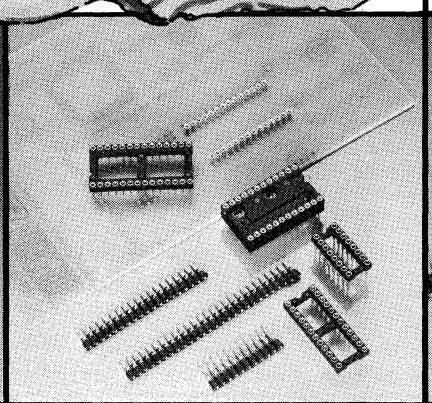




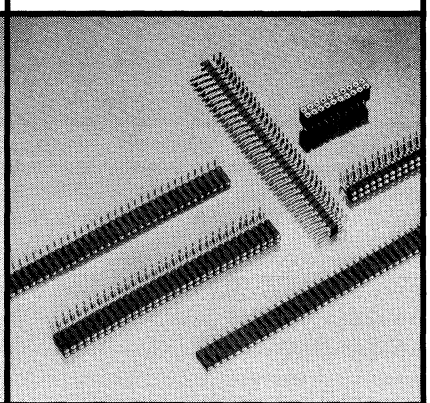
I.C. SOCKETS - DIP + SIP
Open or closed frame, with solder tails or wrapost terminals.



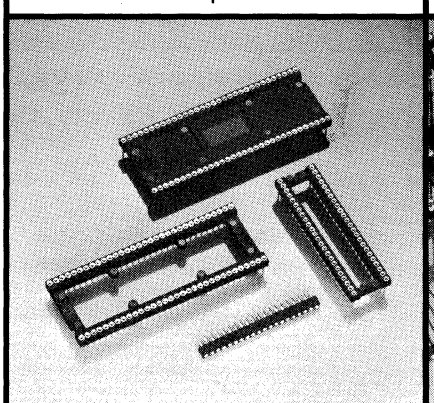
PGA SOCKETS
Molded or machined insulators, with solder tails or wrapost terminals.



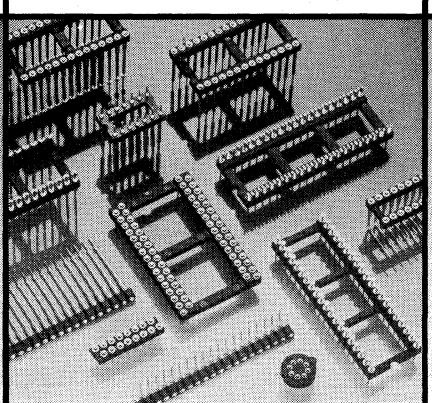
DISPOSABLE SOCKET CARRIERS
DIP and SIP configurations.



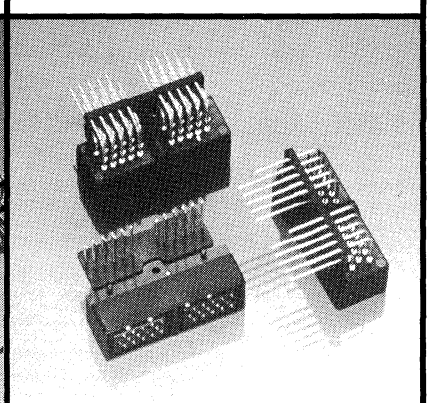
PCB INTERCONNECTS



SHRINK DIP SOCKETS



PIN HEADERS; QUIP, RIGHT ANGLE AND T.O. SOCKETS



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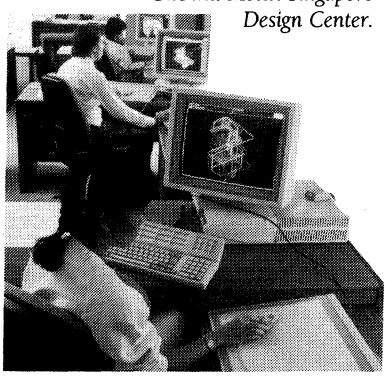
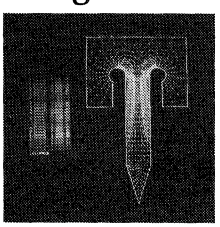
Worldwide Capabilities

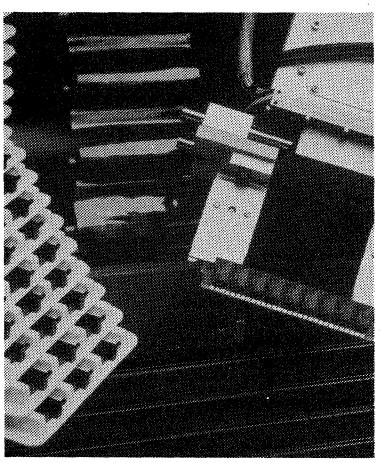


Shown: *Molex Singapore Design Center.*

Design Centers



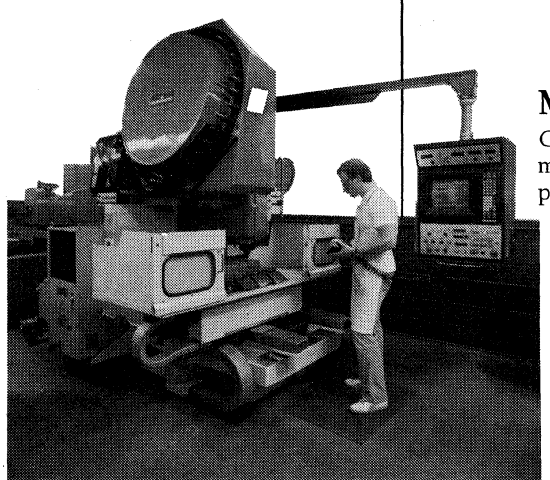
Molex engineering design centers located in the U.S., Singapore, Japan, Germany, Ireland, U.K., France, Brazil and Korea are connected by a worldwide CAD network. Our use of Finite Element Analysis, a predictive engineering "tool," enables the creation of mathematical prototype and simulated performance.



Shown: *Robotic Delivery System.*

Tooling Support

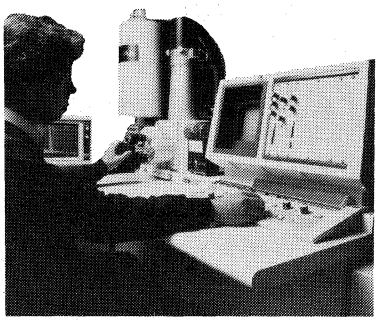
Application tooling for crimp and insulation displacement termination, and robotic delivery systems, lower your applied costs. Molex is committed to designing and building quality equipment to support your assembly operations — from hand tools for prototypes and repairs, to fully automated, high-volume termination machines.



Manufacturing

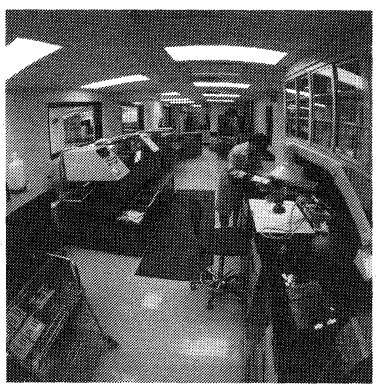
Continuous monitoring of manufacturing systems and processes combined with consistent investments in capital equipment result in improved utilization and the highest quality products.

Shown: *CNC operation allows tooling utilization up to 24 hrs.*



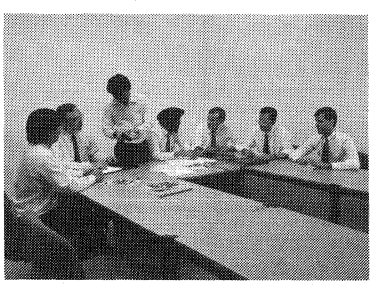
SPC/Quality

Quality at all levels of work at Molex is our #1 priority. To this end, Statistical Process Control training is required of **all** employees; classes are conducted year-round to educate and update.



Reliability Labs

Reliability test labs are located at all manufacturing locations worldwide. The labs' engineering technicians evaluate Molex designs and products, and with the aid of the latest in monitoring equipment, insure long-term dependability. They perform design development and qualification testing as well.



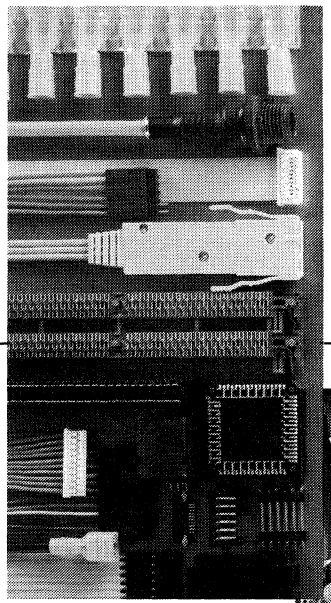
Multi-National Coordination

Our special team coordinates the needs of customers who design, purchase and manufacture in different countries.

Products

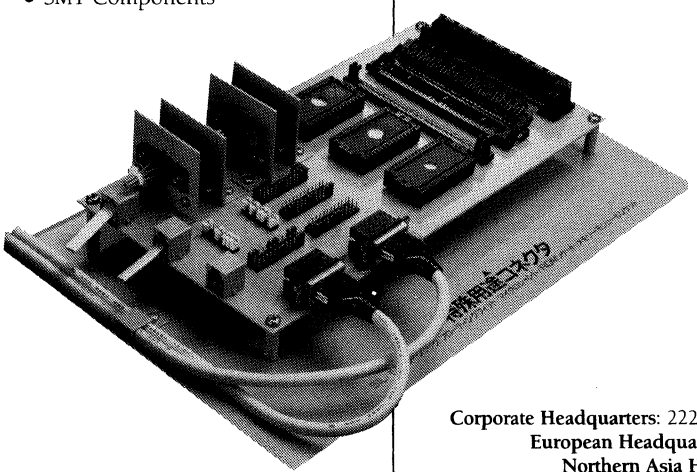
- Custom Automotive Products
- Overmolded/Insert Molded
- Sealed Connectors
- Dense Packaging Systems
- IDT System
- Cable
- PCB Interconnections
- Sockets
- FCC Connectors
- Fiber Optics
- Telephone Connectors
- Pin and Socket Connectors
- Switches
- Application Tooling
- Solderless Terminals
- I/O Connector Systems
- D-Subminiatures
- SMT Components

Connectors



Thirty thousand interconnection components and systems are available from Molex's plants around the world. A wide range of products — from pin & socket power connectors to PLCC sockets — are offered to serve our customers' varied needs.

***Shown:** Longest plating line in S.E. Asia located at MX Singapore.*



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Our New 1989 Full Line Catalog is Here!

Don't be caught with last year's model! Call or write now for your free copy of the NEW Molex No. 890 Full Line Catalog with 760 pages of interconnection products, switches, and application tooling. The No. 890 Catalog provides design assistance and complete ordering information.

Mueller *A COMPLETE LINE OF ELECTRICAL and ELECTRONIC TEST ACCESSORIES*
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Telephone: (216) 771-5225 - FAX: (216) 771-3068 - Telex 288845 Mueller

MICRO-GATOR CLIP (5 Amp.)
(Smallest Insulated Clip Ever Made)

U.S. Patent No. 2,762,028 Trademark Reg.

Micro-Gator

Micro-Gator with Insulator

The alligator clip with the microscopic tip! New design features rivet hinge for greater strength. This is the alligator clip you now can use where no other clip will do . . . on printed circuits, in tight spots and on tiny terminals too crowded for anything but its microscopic tip. Including separate skin-tight insulator, the tip is no bigger than the head of a pin! Yet the Micro-gator has ample thumb grip, and plenty of bite to stand up straight on the smallest terminals. Ample 7/32" (.55) jaw spread. 1-3/32" (2.78) long. Solder connection. Skin-tight flexible vinyl insulator (sold separately) has "lip-action" tip slot so that jaws stay covered whether open or closed.

No. 34 — Steel, cadmium plated
No. 34-C — Solid Copper
No. 36 — **Insulator for 34 and 34-C**

MINI-GATOR CLIP (5 Amp.)

U.S. Patent No. 3,321,736 Trademark Reg.

Mini-gator

Mini-gator with insulator

No. 30-BL

No. 30-TBO

Indispensable for testing or incorporation into miniaturized equipment. Design features rivet hinge for greater strength, full-meshing teeth to grip finest wires. Skin-tight flexible vinyl insulator (sold separately) covers completely — has slotted "lip action" tip. Clip weighs 1/20th oz. has tiny 11/64" (.44) O.D. nose, but ample 3/16" (.48) jaw spread 1-3/32" (2.78) long. Crimping ears. Solder connection. Surprisingly strong bite penetrates corrosion and coatings.

No. 30 — Steel, cadmium plated
No. 30-C — Solid Copper
No. 30-BL — Steel, cadmium plated with rolled barrel tail section, 1-1/4" (3.18) long
No. 30-TBO — Steel, cadmium plated with 6-32 thread steel barrel, 1-1/4" (3.18) long
No. 32 — **Insulator for 30, 30-C**
No. 31 — **Insulator Red and Black only for 30-BL, 30-TBO**

"60 SERIES" ALLIGATOR CLIPS (10 Amp.)

U.S. Patent No. 3,321,736

No. 60 — CONVENTIONAL TYPE

New slim design with full-meshing teeth. Convenient, round thumb grip, barrel connection for banana plug. Equipped with small soldering lip. Strong spring with a hard bite. Cadmium plates. 1-31/32" (5.00) long. **Also available in stainless steel. Ask for No. 60-X.**

No. 60-S — SCREW CONNECTION

Eliminates necessity for soldering. Otherwise same as No. 60.

No. 60-CS — COPPER ALLIGATOR CLIP

Solid copper version of No. 60-S. Screw connection. 1-31/32" (5.00) long.

No. 60PR-2 — SPECIAL BARREL FOR TEST PROD OR PHONE TIP

Barrel crimped to provide friction fit on standard test prod or phone tip. Holds prod on test, frees hand for other work.

No. 60HPR WITH INSULATED HANDLE

Like No. 60PR-2 except with insulated sleeve (red and black).

No. 60-U — SPECIAL U-SHAPED BARREL

U-Shaped barrel allows for greater variety in wire sizes and mechanical use. Steel, cadmium plated, 1-31/32" (5.00) long.

No. 60-TBO — THREADED STEEL BARREL

Tail section of clip has a threaded steel barrel to allow connection to any 8-32 threaded male test prod or screw. Steel, cadmium plated, 2-1/8" (5.40) long.

No. 60-HS — STEEL ALLIGATOR CLIP WITH INSULATED HANDLE

Same as No. 60-S except equipped with red and black insulating sleeves on end. Very convenient for distinguishing leads. Has screw connection also. Cadmium plated. 2-11/32" (5.95) long. Shipped half red, half black.

No. 60-CHS — COPPER ALLIGATOR CLIP, INSULATED HANDLE

Solid copper version of No. 60-HS. Screw connection. Shipped with half red, half black insulating sleeves.

No. 62 FLEXIBLE VINYL INSULATOR

Red and black insulators for Alligator Clips 60, 60-S, 60-CS, 60PR-2, 60-X, 60-U.

COMPLETELY INSULATED ALLIGATOR CLIPS (10 Amp.)

Patent Pending

No. 63 or 63-C Clip

Sold only as a unit, with factory-applied insulators.

Completely insulated right down to the nose. Flexible 2-piece skin-type vinyl insulator of high dielectric strength, with "lip action" slotted tip that permits opening of clip without exposing metal. Insulator nose is only 13/64" O.D. The tight fitting sheath preserves all the slimness of the Alligator Clip, still giving complete protection against shorts in even the tightest spots. Screw connection easily made by slipping insulator forward. 2-1/4" (5.72) long.

No. 63 — INSULATED ALLIGATOR CLIP (STEEL)

Composed of Mueller No. 60-S Alligator Clip steel, cadmium plated, screw connection, complete with 2-piece vinyl insulator. Shipped half with red insulators, half black.

No. 63-C — INSULATED ALLIGATOR CLIP (COPPER)

Solid copper version No. 63 Alligator Clip, screw connection. Shipped half with red insulators, half black.

"70 SERIES" ALLIGATOR CLIPS (10 Amp.)

U.S. Patent No. 2,762,028

Features simplified design, fast connection of wire with cord strain relief ears, patented hinge construction.

No. 70 — FOR SOLDERED CONNECTION

Steel, cadmium plated, 1-11/16" (4.28) long.

No. 70-S

Same as No. 70 with screw.

No. 70-CS — COPPER SCREW CONNECTION

Solid copper version of No. 70-S.

No. 72 — SKIN-TIGHT VINYL INSULATOR

For skin-tight, one-piece insulation for a standard size Alligator Clip! Covers entire clip right down to nose. Special tip slot permits full jaw opening without exposing teeth. Red and black insulators for clips No. 70, No. 70-S and No. 70-CS.

CROCODILE CLIPS (10 Amp.)

No. 85 or 85-C Clip with No. 87 Insulator

No. 85-T Clip

No. 85 — A very small clip with slender, elongated jaws for getting into tight places in radio or electrical test work. Screw connection. 2-1/8" (5.40) long.

No. 85-C — Same as No. 85, except solid copper with phosphor bronze spring, brass screw.

No. 85-T — Crocodile "Tip Clip" — equipped with standard phone tip on one jaw, otherwise same as No. 85. Ideal for use as a prod for ordinary clip connections and for connections to insulated binding posts having nonremovable heads. 2-5/8" (6.67) long.

Use No. 87 Insulators for clips 85, 85-C and 85-T. Red and Black. Covers entire clip except nose. Protects against shorts and shock. Helps to distinguish leads.

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TEST CLIPS

No. 45 PEE WEE (10 Amp.)
A very small test clip for radio, ignition, meter and similar work. 1-17/32" (3.89) long. Jaw spread 5/16". Steel cadmium plated.

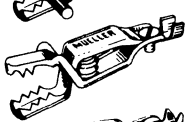
No. 45-C (10 Amp.)
Solid Copper R.F. Test Clip
Solid copper radio frequency test clip. Phosphor bronze spring, brass screw. Will not heat up in high frequency test work, entirely nonferrous. 1-17/32" (3.89) long.
Use No. 47 Insulator for clips 45 and 45-C.

No. 45-C Clip
No. 47 Insulator

No. 48-B (10 Amp.)
A small test and battery clip for radio use and general testing purposes. 2" (5.08) long. Jaw spread 1/2" (1.27). Steel, cadmium plated.
No. 48C — Solid Copper. Same as 48-B.

No. 48B-2E (10 Amp.)
A small test and battery clip for general testing purposes. 2" (5.08) long. Jaw spread 1/2" (1.27). Two rear clinching ears. Steel, cadmium plated.

No. 50-C COPPER NEEDLE CLIP (20 Amp.)
Solid copper clip with beryllium copper piercing needle in the top jaw for quick test contact through wire insulation. 6-32 brass set screw, 2-9/32" (5.79) long.



No. 51-C COPPER CLIP (20 Amp.)
Same as No. 50-C but without needle. Ideal for meter testing.

No. 55 (10 Amp.)
Designed for electronic meter, ignition, and general testing. Features interlocking neck construction. Meshing teeth at front of jaw. 2" (5.08) long. Jaws open 7/16" (1.11).

No. 95
Same as No. 55 without ears on tail.
Use No. 49 Insulator for clip No. 48-B, 48-C, 48B-2E, 50-C, 51-C, 55 and 95.

No. 80 (25 Amp.)
Lighter construction clip with interlocking design. Ideal for battery chargers, trickle chargers, storage battery operated devices, automotive test equipment and general test work. 2-27/32" (7.22) long. Jaws open 3/4" (1.90).
Use No. 26 Insulator for clip No. 80.

No. 96 (50 Amp.)
A standard for battery charging work or for use on battery-powered equipment. Interlocking jaws. 8/32 screw. 4-7/64" (10.44) long. Jaws open 13/16" (2.06).
Use No. 23 Insulator for clip No. 96.

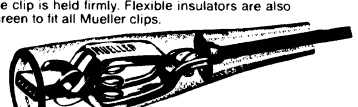
No. 27 (20 Amp.)
A high grade test clip with meshing teeth on three sides of jaws. For laboratory and shop test work. 2-7/16" (6.19) long. Jaw spread 5/8" (1.59). Steel, cadmium plated.
No. 27-C — Solid copper. Same size as No. 27. (40 Amp.)

No. 27-CG or No. 27-CGW GEOPHONE COPPER CLIPS

Highly specialized solid copper clips for use in geophysical work. Curved jaws clip onto seismograph cable rings. May be simply "yanked out" when test is completed.
No. 27-CG has 7/32" (.55) wide jaw
No. 27-CGW has 13/32" (1.03) wide jaw
Use No. 29 Insulator for clips 27, 27-C, 27-CG and 27-CGW.

FLEXIBLE INSULATORS FOR CLIPS

A convenient protection against short circuit and electric shock. Colors help distinguish leads. Packed half red and half black to indicate polarity. Long tail prevents breakage of wire. Constructed so the clip is held firmly. Flexible insulators are also available in blue, white, yellow and green to fit all Mueller clips.

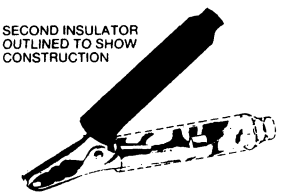


Insulator No.	For Use With Clip No.
13*	11-A, 11-C
23*	21-A, 21-C, 96
26*	24-A, 25, 25-C, 80
29*	27, 27-C, 27-CG, 27-CGW
31	30-BL, 30-TBO
32*	30, 30-C
35	33-C
74	95
90*	27, 27-C, 27-CG, 27-CGW
36*	34, 34-C
47*	45, 45-C
46-1 Pair	46-A, 46-C, 46-T
43 Pair	41-A, 41-C

Insulator No.	For Use With Clip No.
49*	48-B, 48-C, 48B-2E, 50-C, 51-C, 55, 95
62*	60, 60-S, 60-CS, 60PR-2, 60-U, 60-X
72*	70, 70-S, 70-CS
87*	85, 85-C, 85-T

***Also available in blue, white, yellow and green.**

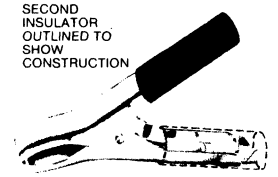
HIPPO-CLIP



HIPPO-CLIP — For battery booster cables and fast chargers. Proved higher quality and superior design. Built-in solder strap and clinching ears for fast, sure cable connection. Supplied with vinyl handle insulators in red or black. Full 1-9/16" (3.97) jaw spread. 6" (15.24) long.

No. 41-A — Steel, bright copper plated. 200 amp
No. 41-C — Solid Copper, 400 amp
No. 43 — Insulator only, sold in pairs

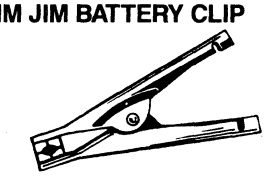
PIGMY HIPPO-CLIP



PIGMY HIPPO-CLIP — A new small plier clip for battery operated equipment and automotive test. Flat, wide handle allows positive grip. Won't "squirt away". Built-in solder strap and wire clinching ears. Supplied with vinyl handle insulators in red or black. Ample 1-1/8" (2.85) jaw spread. 2-13/16" (7.14) long.

No. 46-A — Steel, bright copper plated, 50 amp
No. 46-C — Solid Copper, 75 amp
No. 46-T — With male tab to accept female solderless disconnects
No. 46-1 — Insulator Only, sold in pairs

No. 44 CLIP, 400 AMP SLIM JIM BATTERY CLIP



Slim Jim clips feature solid copper jaws especially designed to provide fast, positive connections on conventional top and newer side terminals. Long, slim design provides optimum leverage and facilitates working in close quarters. Fully insulated vinyl-clad steel clips are available in red or black.

SPECIFICATIONS: Jaw Opening: 2"
Jaws: Solid Copper

LARGER SIZES OF CLIPS

No. 24-A — 25 Amp. Steel, zinc plated. 2-27/32"

No. 25 — 40 Amp. Steel, cadmium plated. 3"
No. 25-C — 75 Amp. Solid Copper. 3"

No. 21-A — 50 Amp. Steel, zinc plated. 4-7/64"

No. 21-C* — 100 Amp. Solid Copper. 4-1/2"
No. 11-A* — 100 Amp. Steel, zinc plated. 6"
No. 11-C* — 200 Amp. Solid Copper. 6"
No. 33-C* — 300 Amp. Solid Copper. 7-3/4"

KELVIN CLIPS

75-K

77-K

The Kelvin clip is used for 4-wire resistance measurement systems. The two jaws of the Kelvin clip are electrically isolated from each of them when open and shorted to each other through the component lead under test when closed. One jaw provides a current path for the source while the other provides a circuit path for the sense. Specifications: 75-K: Contacts: Copper/Silver. Handles: Glass filled nylon. Maximum Jaw Opening: 5/16". Maximum Wire Size: #18 AWG. Color: Black. Connections: Slotted Screws. Std. Pk.: 10. 77-K: Contacts: Gold plated copper. Handles: Glass filled nylon. Maximum Jaw Opening: 1-1/8". Maximum Wire Size: #16 AWG. Fulcrum: Nylon. Color: Black. Connections: Allen head set screws. Std. Pk.: 1.

*Furnished with detachable lug connection for easy securing to large cables

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STACKABLE DOUBLE BANANA PLUG TO RG 174/U COAXIAL CABLE

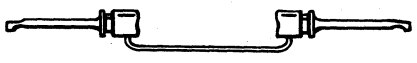
No.	Length
0070-F-24-*	24" (609.6mm)
0070-F-36-*	36" (914.4mm)

Std. Pk.: 1

Double Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.

Coaxial Cable: Shielded RG 174/U, MIL-C-17D, 50 Ohm.
***Color Code:** Specify - 0 for Black - 2 for Red Banana plug moldings. Cable is black only.

"CLIPPER" TEST CLIP — BOTH ENDS



"Clippers" (plunger-type clips) make difficult IC connections fast and easy. Spring-loaded beryllium copper conductor attaches firmly yet gently to delicate component leads and terminals. Offered with 4 different sizes of "Clippers", 5 different lengths and 6 different colors. See chart below.

Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red - 4 for Yellow - 5 for Green - 6 for Blue - 7 for Violet.

No. 201 1.75" Clipper	No. 202 2.5" Clipper	No. 203 3.5" Clipper	No. 205 5" Clipper	
No.	No.	No.	No.	Length
1010-A-12-*	1111-A-12-*	1212-A-12*	1313-A-12-*	12" (304.8mm)
1010-A-24-*	1111-A-24-*	1212-A-24*	1313-A-24-*	24" (609.6mm)
1010-A-36-*	1111-A-36-*	1212-A-36*	1313-A-36-*	36" (914.4mm)
1010-A-48-*	1111-A-48-*	1212-A-48*	1313-A-48-*	48" (1219.2mm)
1010-A-60-*	1111-A-60-*	1212-A-60*	1313-A-60-*	60" (1524.0mm)

Std. Pk.: 1

"MICRO-CLIPPER" TEST CLIP TO MINIATURE, STACKABLE BANANA PLUG

No.	Length
1023-A-12-*	12" (304.8mm)
1023-A-24-*	24" (609.6mm)
1023-A-36-*	36" (914.4mm)
1023-A-48-*	48" (1219.2mm)
1023-A-60-*	60" (1524.0mm)

Std. Pk.: 1

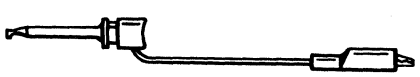
Micro-Clipper's No. 201 spring-loaded hook attaches to delicate component leads and terminals to free hands while trouble-shooting. One-piece beryllium copper conductor provides maximum heat dissipation.
Hook-up Wire: Stranded 41/36 #20 AWG tinned copper with 105°C. PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red.
Miniature Banana Plug features conventional four-leaf nickel-plated beryllium copper spring with nickel-plated brass body. Multiple stacking feature simplifies circuit connections and changes.

"MICRO-CLIPPER" TEST CLIP TO INSULATED MINI-ALLIGATOR CLIP

No.	Length
1031-A-12-*	12" (304.8mm)
1031-A-24-*	24" (609.6mm)
1031-A-36-*	36" (914.4mm)
1031-A-48-*	48" (1219.2mm)
1031-A-60-*	60" (1524.0mm)

Std. Pk.: 1



Micro-Clipper's No. 201 spring-loaded hook attaches to delicate component leads and terminals to free hands while trouble-shooting. One-piece beryllium copper conductor provides maximum heat dissipation.
***Color Code:** Specify - 0 for Black - 2 for Red.

30BL Insulated Mini-Alligator Clip - Plated steel with 3/16" jaw opening.
Hook-up Wire: Stranded 41/36 #20 AWG tinned copper with 105°C PVC insulation.

"MICRO-CLIPPER" TEST CLIP TO .025 SQUARE PIN RECEPTACLE

No.	Length
1080-E-12-*	12" (304.8mm)
1080-E-24-*	24" (609.6mm)
1080-E-36-*	36" (914.4mm)

Std. Pk.: 1

Micro-Clipper No. 201 for fast and easy terminal connections.
Pin Receptacle: .025" (0.64mm) Copper-Nickel-Tin Alloy 725 with .000030" Gold Contact Plating. Mates to .025" x .025" (0.64mm x 0.64mm) square pin. Housing is ABS.

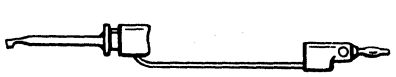
Hook-up Wire: 19/34 #22 AWG tinned copper with 105°C. PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-CLIPPER" TEST CLIP TO STACKABLE BANANA PLUG

No.	Length
1120-A-12-*	12" (304.8mm)
1120-A-24-*	24" (609.6mm)
1120-A-36-*	36" (914.4mm)
1120-A-48-*	48" (1219.2mm)
1120-A-60-*	60" (1524.0mm)

Std. Pk.: 1

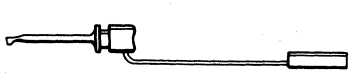


Mini-Clipper's No. 202 spring-loaded beryllium copper hook attaches to delicate component leads and terminals.
Banana plug features exclusive nine-leaf beryllium copper nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-CLIPPER" TEST CLIP TO IN-LINE BANANA JACK

No.	Length
1125-A-3-*	3" (76.14mm)
1125-A-12-*	12" (304.8mm)
1125-A-24-*	24" (609.6mm)
1125-A-36-*	36" (914.4mm)
1125-A-48-*	48" (1219.2mm)

Std. Pk.: 1



Mini-Clipper's No. 202 spring-loaded beryllium copper conductor provides maximum heat dissipation.
In-Line Banana Jack accepts all standard banana plugs. Nickel-plated brass insert and ABS molded insulation.

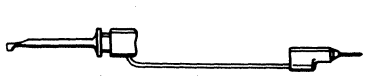
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-CLIPPER" TEST CLIP TO .080 PIN TIP PLUG WITH 4MM JACK

No.	Length
1145-A-12-*	12" (304.8mm)
1145-A-24-*	24" (609.6mm)
1145-A-36-*	36" (914.4mm)
1145-A-48-*	48" (1219.2mm)
1145-A-60-*	60" (1524.0mm)

Std. Pk.: 1



Mini-Clipper No. 202 features a spring-loaded beryllium copper conductor for maximum heat dissipation.
Pin Tip Plug is nickel-plated with .163 diameter jack to accept a 4mm banana plug. Stacking feature simplifies circuit connections and changes.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-CLIPPER" TEST CLIP TO TINNED END WIRE

No.	Length
1149-A-12-*	12" (304.8mm)
1149-A-24-*	24" (609.6mm)
1149-A-36-*	36" (914.4mm)
1149-A-48-*	48" (1219.2mm)
1149-A-60-*	60" (1524.0mm)

Std. Pk.: 1

Mini-Clipper's No. 202 spring-loaded hook attaches to delicate component leads and terminals to free hands while trouble-shooting. One-piece beryllium copper conductor provides maximum heat dissipation.

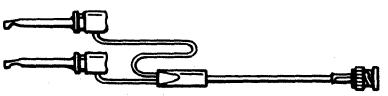
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-CLIPPER" TEST CLIPS TO BNC MALE

No.	Length
1150-C-12-0	12" (304.8mm)
1150-C-24-0	24" (609.6mm)
1150-C-36-0	36" (914.4mm)
1150-C-48-0	48" (1219.2mm)
1150-C-60-0	60" (1524.0mm)

Std. Pk.: 1



Mini-Clippers No. 202 feature a spring-loaded beryllium copper conductor for maximum heat dissipation. Positive and negative Clippers have 3" and 8" lead wires, respectively. Molded "Y" block prevents separation and contact corrosion.

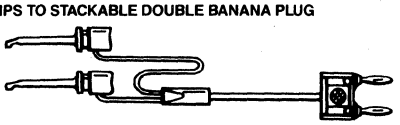
BNC Male Connector, MIL-C-39012, has gold-plated center contact and silver-plated body.

Coaxial Cable: Shielded RG58C/U, MIL-C-17F, 50 Ohm.

"MINI-CLIPPER" TEST CLIPS TO STACKABLE DOUBLE BANANA PLUG

No.	Length
1170-C-12-0	12" (304.8mm)
1170-C-24-0	24" (609.6mm)
1170-C-36-0	36" (914.4mm)
1170-C-48-0	48" (1219.2mm)
1170-C-60-0	60" (1524.0mm)

Std. Pk.: 1



Mini-Clippers No. 202 feature a spring-loaded beryllium copper conductor for maximum heat dissipation. Positive and negative Clippers have 3" and 8" lead wires, respectively. Molded "Y" block prevents separation and contact corrosion.

Double Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Coaxial Cable: Black Shielded RG58C/U, MIL-C-17F, 50 Ohm.

"MINI-MICRO-CLIPPER" — BOTH ENDS

No.	Length
1414-E-12-*	12" (304.8mm)
1414-E-24-*	24" (609.6mm)
1414-E-36-*	36" (914.4mm)
1414-E-48-*	48" (1219.2mm)
1414-E-60-*	60" (1524.0mm)

Std. Pk.: 1

MINI-MICRO CLIPPER No. 208 One piece gold plated beryllium copper conductor. Nylon stem & cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.

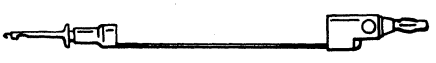
Hook-up Wire: #22 AWG (19/#34) tinned copper with 105°C. PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-MICRO-CLIPPER" TO STACKABLE BANANA PLUG

No.	Length
1420-A-12-*	12" (304.8mm)
1420-A-24-*	24" (609.6mm)
1420-A-36-*	36" (914.4mm)
1420-A-48-*	48" (1219.2mm)
1420-A-60-*	60" (1524.0mm)

Std. Pk.: 1

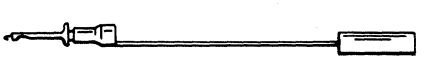


MINI-MICRO CLIPPER No. 208 One piece gold plated beryllium copper conductor. Nylon stem & cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.
Banana plug features nine-leaf beryllium copper nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-MICRO-CLIPPER" TO IN-LINE BANANA JACK

No.	Length
1425-A-12-*	12" (304.8mm)
1425-A-24-*	24" (609.6mm)
1425-A-36-*	36" (914.4mm)
1425-A-48-*	48" (1219.2mm)
1425-A-60-*	60" (1524.0mm)

Std. Pk.: 1



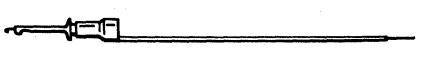
MINI-MICRO CLIPPER No. 208 One piece gold plated beryllium copper conductor. Nylon stem & cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.

In-Line Banana Jack accepts all standard banana plugs. Nickel-plated brass insert and ABS molded insulation.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-MICRO-CLIPPER" TO TINNED END WIRE

No.	Length
1449-E-12-*	12" (304.8mm)
1449-E-24-*	24" (609.6mm)
1449-E-36-*	36" (914.4mm)
1449-E-48-*	48" (1219.2mm)
1449-E-60-*	60" (1524.0mm)

Std. Pk.: 1



MINI-MICRO CLIPPER No. 208 One piece gold plated beryllium copper conductor. Nylon stem & cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.

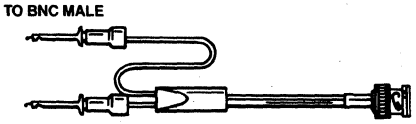
Hook-up Wire: #22 AWG (19/#34) tinned copper with 105°C. PVC insulation.

***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-MICRO-CLIPPER" TO BNC MALE

No.	Length
1450-C-12-0	12" (304.8mm)
1450-C-24-0	24" (609.6mm)
1450-C-36-0	36" (914.4mm)
1450-C-48-0	48" (1219.2mm)
1450-C-60-0	60" (1524.0mm)

Std. Pk.: 1



MINI-MICRO CLIPPER No. 208 One piece gold plated beryllium copper conductor. Nylon stem & cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.

BNC Male Connector, MIL-C-39012, has gold-plated center contact and silver-plated body.
Coaxial Cable: Shielded RG58C/U, MIL-C-17F, 50 Ohm.

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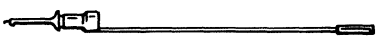
"MINI-MICRO-CLIPPER" TO .025 SQUARE PIN RECEPTACLE

No.	Length
1480-E-12-*	12" (304.8mm)
1480-E-24-*	24" (609.6mm)
1480-E-36-*	36" (914.4mm)

Std. Pk.: 1



MINI-MICRO CLIPPER No. 208 One piece gold plated beryllium copper conductor. Nylon stem & Cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.
Pin Receptacle: .025" (0.64mm) Copper-Nickel-Tin Alloy 725 with .000030" Gold Contact Plating. Mates to .025" x .025" (0.64mm x 0.64mm) square pin. Housing is ABS.
Hook-up Wire: #22 AWG (19/#34) tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"MINI-MICRO-CLIPPER" TO .025" SQUARE PIN

No.	Length
1481-E-12-*	12" (304.8mm)
1481-E-24-*	24" (609.6mm)
1481-E-36-*	36" (914.4mm)

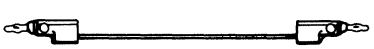
Std. Pk.: 1

Mini-Micro-Clipper No. 208 One piece gold plated beryllium copper conductor. Nylon stem & cap. Stainless steel compression spring. Attaches to .025" diameter and smaller component leads.
.025 Square Pin: Gold plated alloy 360. Housing: ABS.
Hook-up Wire: #22 AWG (19/#34) tinned copper with 105°C. PVC insulation.
***Color Code: Specify - 0 for Black - 2 for Red.**

STACKABLE SINGLE BANANA PLUG — BOTH ENDS

No.	Length
2020-A-12-*	12" (304.8mm)
2020-A-24-*	24" (609.6mm)
2020-A-36-*	36" (914.4mm)
2020-A-48-*	48" (1219.2mm)
2020-A-60-*	60" (1524.0mm)

Std. Pk.: 1

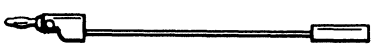


Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Hook-up Wire: 41/36 #20 AWG tinned copper with high temperature 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

STACKABLE SINGLE BANANA PLUG TO IN-LINE BANANA JACK

No.	Length
2025-A-12-*	12" (304.8mm)
2025-A-24-*	24" (609.6mm)
2025-A-36-*	36" (914.4mm)

Std. Pk.: 1

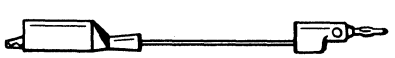


Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
In-Line Banana Jack accepts all standard banana plugs. Nickel-plated brass insert and ABS molded insulation.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

INSULATED ALLIGATOR CLIP TO STACKABLE BANANA PLUG

No.	Length
2030-A-12-*	12" (304.8mm)
2030-A-24-*	24" (609.6mm)
2030-A-36-*	36" (914.4mm)
2030-A-48-*	48" (1219.2mm)
2030-A-60-*	60" (1524.0mm)

Std. Pk.: 1



60PR-2 Alligator Clip: Plated steel with 5/16" jaw opening.
Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Hook-up Wire: Stranded 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

INSULATED MINI-ALLIGATOR CLIP TO STACKABLE BANANA PLUG

No.	Length
2031-A-12-*	12" (304.8mm)
2031-A-24-*	24" (609.6mm)
2031-A-36-*	36" (914.4mm)
2031-A-48-*	48" (1219.2mm)
2031-A-60-*	60" (1524.0mm)

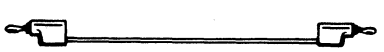
Std. Pk.: 1

30BL Insulated Mini-Alligator Clip: Plated steel with 3/16" jaw opening.
Hook-up Wire: Stranded 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.
Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.

STACKABLE MINIATURE BANANA PLUG — BOTH ENDS

No.	Length
2323-A-12-*	12" (304.8mm)
2323-A-24-*	24" (609.6mm)
2323-A-36-*	36" (914.4mm)

Std. Pk.: 1



Ideal for miniaturized test equipment and systems.
Miniature Banana Plug: Fits .104" (2.64mm) diameter jack. Features nickel-plated brass body with beryllium copper spring.
Jack: 104" (2.64mm) diameter to accept stacking. Housing is ABS.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

INSULATED MINIATURE ALLIGATOR CLIP TO STACKABLE MINIATURE BANANA PLUG

No.	Length
2331-A-12-*	12" (304.8mm)
2331-A-24-*	24" (609.6mm)
2331-A-36-*	36" (914.4mm)
2331-A-48-*	48" (1219.2mm)
2331-A-60-*	60" (1524.0mm)

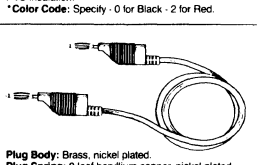
Std. Pk.: 1

No. 30BL Clip with PVC insulator.
Miniature Banana Plug: Fits .104" (2.64mm) dia. jack. Features nickel-plated brass body with beryllium copper spring.
Jack: .104" (2.64mm) dia. to accept stacking. Housing is ABS.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"ULTRA-FLEX" TEST LEADS

No.	Length	Color
3025	250 mm (9.843")	Specify color. Red, black, yellow, blue, green or violet.
3050	500 mm (19.685")	
3100	1000 mm (39.370")	
3150	1500 mm (59.055")	
3200	2000 mm (78.740")	

Std. Pk.: 12

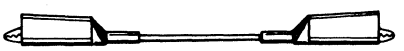


Laboratory-grade test leads provide superior performance and longer test lead life. Main conductor consists of 512 strands of soft drawn copper wire for tangle-free operation. Pure silicone rubber insulation withstands temperatures from -100°C to 300°C (-148°F to 572°F). Thermoplastic banana plug body resists chemical influences and helps prevent conductor separation with a strain relief. All test leads feature a stackable banana plug and jack at both ends to provide multiple outputs from one input source.
Plug Handle: Thermoplastic PVC insulated.
Plug Body: Brass, nickel plated.
Plug Spring: 9-leaf beryllium copper, nickel plated.
Plug Jack: 4mm (.163") diameter brass, nickel plated stackable jack.
Wire Insulation: 1mm (0.040") thick, scratch resistant pure silicone rubber, 3.3mm (0.130") overall diameter.
Wire Lead: Ultra flexible 0.75mm (0.029") cross-section consisting of 512 twisted copper strands each 0.05mm (0.002") in diameter. 1984 circular mills.
Rating: 30 amp maximum load.

INSULATED ALLIGATOR CLIP — BOTH ENDS

No.	Length
3030-A-12-*	12" (304.8mm)
3030-A-24-*	24" (609.6mm)
3030-A-36-*	36" (914.4mm)
3030-A-48-*	48" (1219.2mm)
3030-A-60-*	60" (1524.0mm)

Std. Pk.: 1

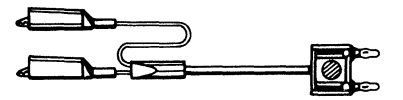


60PR-2 Alligator Clips — steel cadmium plated with 5/16" jaw opening (other clips available upon request). Insulator color matches 41/36 #20 AWG tinned copper hook-up wire.
***Color Code:** Specify - 0 for Black - 2 for Red - 4 for Yellow - 5 for Green - 6 for Blue

INSULATED ALLIGATOR CLIPS TO STACKABLE DOUBLE BANANA PLUG

No.	Length
3070-C-12-0	12" (304.8mm)
3070-C-24-0	24" (609.6mm)
3070-C-36-0	36" (914.4mm)
3070-C-48-0	48" (1219.2mm)
3070-C-60-0	60" (1524.0mm)

Std. Pk.: 1



60-PR-2 Insulated Alligator Clips - steel cadmium plated with 5/16" jaw opening. Positive and negative clips have 2" and 7" lead wires, respectively. Molded "Y" block prevents separation and contact corrosion. PVC Clip Insulators.
Double Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Coaxial Cable: Shielded RG58C/U. MIL-C-17F. 50 Ohm.

INSULATED MINI-ALLIGATOR CLIP — BOTH ENDS

No.	Length
3131-A-12-*	12" (304.8mm)
3131-A-24-*	24" (609.6mm)
3131-A-36-*	36" (914.4mm)
3131-A-48-*	48" (1219.2mm)
3131-A-60-*	60" (1524.0mm)

Std. Pk.: 1

30BL Insulated Mini-Alligator Clips: Plated steel with 3/16" jaw opening. Insulator color matches stranded 41/36 #20 AWG tinned copper hook-up wire. PVC Clip Insulators.
***Color Code:** Specify - 0 for Black - 2 for Red - 4 for Yellow - 5 for Green - 6 for Blue - 9 for White

INSULATED MINI-ALLIGATOR CLIP TO .025 SQUARE PIN RECEPTACLE

No.	Length
3180-E-12-*	12" (304.8mm)
3180-E-24-*	24" (609.6mm)
3180-E-36-*	36" (914.4mm)
3180-E-48-*	48" (1219.2mm)
3180-E-60-*	60" (1524.0mm)

Std. Pk.: 1

30BL Insulated Mini-Alligator Clip: Plated steel with 3/16" jaw opening PVC Clip Insulators.
Pin Receptacle: Copper/nickel/tin alloy 725 with .000030" gold plated conductor housed in ABS plastic.
Hook-up Wire: 19/34 #22 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red.

"ULTRA-FLEX" LEAD WIRE ONLY

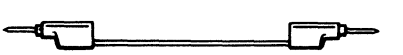
No. 4100 - Laboratory-grade test leads provide superior performance and longer test lead life. Main conductor consists of 512 strands of soft drawn copper wire for tangle-free operation. Pure silicone rubber insulation withstands temperatures from -100°C to 300°C (-148°F to 572°F).
Wire Insulation: 1mm (0.040") thick, scratch resistant pure silicone rubber, 3.3mm (0.130") overall diameter.

Wire Lead: Ultra flexible 0.75mm (0.029") cross-section consisting of 512 twisted copper strands each 0.05mm (0.002") in diameter. 1984 circular mills.
Rating: 30 amp maximum load.
Supplied in red and black. Specify color.
Minimum order 100 ft.

STACKABLE .080 PIN PLUG — BOTH ENDS

No.	Length
4444-A-12-*	12" (304.8mm)
4444-A-24-*	24" (609.6mm)
4444-A-36-*	36" (914.4mm)

Std. Pk.: 1

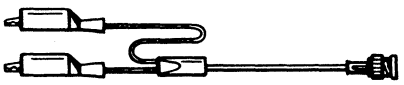


For instruments that utilize tip jacks. Multiple stacking feature simplifies circuit connection and changes.
Pin Tip: .080" (2.03mm) diameter, .500" (12.70mm) long, brass, nickel plated.
Tip Jack: Beryllium copper, nickel plated, accepts .080" Dia. pin. Housing is ABS.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red

BNC MALE TO INSULATED ALLIGATOR CLIPS

No.	Length
5030-C-12-0	12" (304.8mm)
5030-C-24-0	24" (609.6mm)
5030-C-36-0	36" (914.4mm)
5030-C-48-0	48" (1219.2mm)
5030-C-60-0	60" (1524.0mm)

Std. Pk.: 1

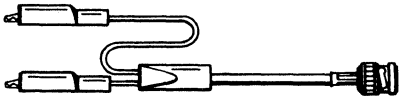


BNC Male Connector, MIL-C-39012, features a gold-plated center contact and silver-plated body.
60-PR-2 Alligator Clips — plated steel with 5/16" jaw opening. Positive and negative clips have 2" and 7" lead wires, respectively. Molded "Y" block prevents separation and contact corrosion. PVC clip insulators.
Coaxial Cable: Shielded RG 58C/U, MIL-C-17F. 50 Ohm.

INSULATED MINI-ALLIGATOR CLIPS TO BNC MALE

No.	Length
5031-C-12-0	12" (304.8mm)
5031-C-24-0	24" (609.6mm)
5031-C-36-0	36" (914.4mm)
5031-C-48-0	48" (1219.2mm)
5031-C-60-0	60" (1524.0mm)

Std. Pk.: 1



Mueller 30BL Insulated Alligator Clips: Plated steel with 3/16" jaw opening.
Positive and negative clips have 2" and 7" lead wires, respectively. Molded "Y" block prevents separation and contact corrosion.
BNC Male Connector, MIL-C-39012, features a gold-plated center conductor and silver plated body.
Coaxial Cable: Shielded RG58C/U, MIL-C-17F. 50 OHM.

BNC MALE — BOTH ENDS

No.	Length
5050-B-12-0	12" (304.8mm)
5050-B-24-0	24" (609.6mm)
5050-B-36-0	36" (914.4mm)
5050-B-48-0	48" (1219.2mm)
5050-B-60-0	60" (1524.0mm)

Std. Pk.: 1

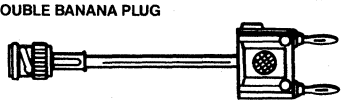
BNC Male Connectors, MIL-C-39012, feature gold-plated center contact with silver-plated body.
Coaxial Cable: Shielded RG58C/U, MIL-C-17F. 50 Ohm.

Mueller
A COMPLETE LINE OF ELECTRICAL and ELECTRONIC TEST ACCESSORIES
1583 E. 31st St., Cleveland, Ohio 44114, U.S.A.
Telephone: (216) 771-5225 - FAX: (216) 771-3068 - Telex 288845 Mueler

BNC MALE TO STACKABLE DOUBLE BANANA PLUG

No.	Length
5070-B-12-0	12" (304.8mm)
5070-B-24-0	24" (609.6mm)
5070-B-36-0	36" (914.4mm)
5070-B-48-0	48" (1219.2mm)
5070-B-60-0	60" (1524.0mm)

Std. Pk. 1



BNC Male Connector, MIL-C-39012, features a gold-plated center contact and silver-plated body.
Double Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Coaxial Cable: Shielded RG58C/U, MIL-C-17F, 50 Ohm.

BNC MALE BREAKOUT STYLE TO TINNED END WIRES

No.	Length
5100-A-4-0	4" (101.6mm)

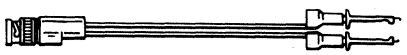
Std. Pk. 1

BNC Male: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C PVC insulation.

BNC MALE BREAKOUT STYLE TO "MINI-MICRO-CLIPPER" TEST CLIPS

No.	Length
5114-A-4-0	4" (101.6mm)

Std. Pk. 1

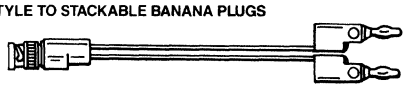


BNC Male: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Mini-Micro-Clipper: Gold plated beryllium copper conductor. Nylon stem and cap.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C PVC insulation.

BNC MALE BREAKOUT STYLE TO STACKABLE BANANA PLUGS

No.	Length
5120-A-4-0	4" (101.6mm)

Std. Pk. 1

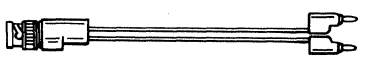


BNC Male: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Banana Plug: Features exclusive 9 leaf nickel plated beryllium copper spring and alloy 360 body for minimum contact resistance. Multiple stacking feature. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C PVC insulation.

BNC MALE BREAKOUT STYLE TO STACKABLE MINIATURE BANANA PLUGS

No.	Length
5123-A-4-0	4" (101.6mm)

Std. Pk. 1

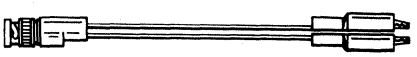


BNC Male: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Miniature Banana Plug: Fits .104" diameter jack. Nickel plated brass body with beryllium copper spring. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C. PVC insulation.

BNC MALE BREAKOUT STYLE TO INSULATED MINI-GATOR CLIPS

No.	Length
5131-A-4-0	4" (101.6mm)

Std. Pk. 1

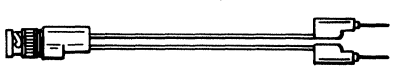


BNC Male: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Clips: Mueller No. 30 with PVC insulators No. 31.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C PVC insulation.

BNC MALE BREAKOUT STYLE TO STACKABLE .080" PIN PLUGS

No.	Length
5144-A-4-0	4" (101.6mm)

Std. Pk. 1

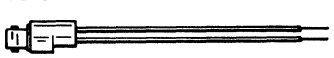


BNC Male: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Pin Tip: .080" Diameter, .500" long, brass, nickel plated.
Tip Jack: Beryllium copper, nickel plated, accepts .080" dia. pin. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C PVC insulation.

BNC FEMALE BREAKOUT STYLE TO TINNED END WIRES

No.	Length
5200-A-4-0	4" (101.6mm)

Std. Pk. 1

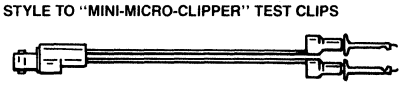


BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C. PVC insulation.

BNC FEMALE BREAKOUT STYLE TO "MINI-MICRO-CLIPPER" TEST CLIPS

No.	Length
5214-A-4-0	4" (101.6mm)

Std. Pk. 1

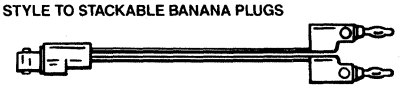


BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS
Mini-Micro-Clipper: Gold plated beryllium copper conductor. Nylon stem and cap.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C. PVC insulation.

BNC FEMALE BREAKOUT STYLE TO STACKABLE BANANA PLUGS

No.	Length
5220-A-4-0	4" (101.6mm)

Std. Pk. 1

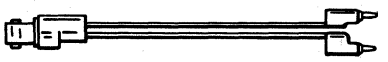


BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Banana Plug: Features exclusive 9 leaf nickel plated beryllium copper spring and alloy 360 body for minimum contact resistance. Multiple stacking feature. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C PVC insulation.

BNC FEMALE BREAKOUT STYLE TO STACKABLE MINIATURE BANANA PLUGS

No.	Length
5223-A-4-0	4" (101.6mm)

Std. Pk. 1



BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Miniature Banana Plug: Fits .104" diameter jack. Nickel plated brass body with beryllium copper spring. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C. PVC insulation.

BNC FEMALE BREAKOUT STYLE TO INSULATED MINI-GATOR CLIPS

No.	Length
5231-A-4-0	4" (101.6mm)

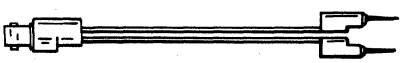
Std. Pk. 1

BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Clips: Mueller No. 30 with PVC insulators No. 31.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C. PVC insulation.

BNC FEMALE BREAKOUT STYLE TO STACKABLE .080" PIN PLUGS

No.	Length
5244-A-4-0	4" (101.6mm)

Std. Pk. 1

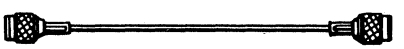


BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact. Housing: ABS.
Pin Tip: .080" Diameter, .500" long, brass, nickel plated.
Tip Jack: Beryllium copper, nickel plated, accepts .080" dia. pin. Housing: ABS.
Hook-up Wire: #20 AWG (41/#36) tinned copper with 105°C. PVC insulation.

TNC MALE — BOTH ENDS

No.	Length
5555-B-12-0	12" (304.8mm)
5555-B-24-0	24" (609.6mm)
5555-B-36-0	36" (914.4mm)
5555-B-48-0	48" (1219.2mm)
5555-B-60-0	60" (1524.0mm)

Std. Pk. 1

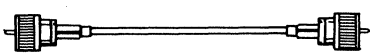


TNC Male Connectors feature gold-plated center contact with nickel-plated body.
Coaxial Cable: Shielded RG 58 C/U, MIL-C-17F, 50 Ohm.

UHF MALE — BOTH ENDS

No.	Length
6060-B-12-0	12" (304.8mm)
6060-B-24-0	24" (609.6mm)
6060-B-36-0	36" (914.4mm)
6060-B-48-0	48" (1219.2mm)
6060-B-60-0	60" (1524.0mm)

Std. Pk. 1



Crimped **UHF Male Connectors** feature nickel-plated brass contact.
Coaxial Cable: Shielded RG 58C/U, MIL-C-17F, 50 Ohm.

STACKABLE DOUBLE BANANA PLUG — BOTH ENDS

No.	Length
7070-B-12-*	12" (304.8mm)
7070-B-24-*	24" (609.6mm)
7070-B-36-*	36" (914.4mm)
7070-B-48-*	48" (1219.2mm)
7070-B-60-*	60" (1524.0mm)

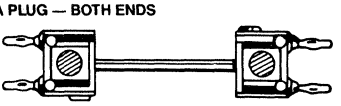
Std. Pk. 1

Double Banana Plugs feature exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Coaxial Cable: Shielded RG58C/U, MIL-C-17F, 50 Ohm.
***Color Code:** Specify - 0 for Black - 2 for Red Banana Plug moldings. Cable is black only.

STACKABLE DOUBLE BANANA PLUG — BOTH ENDS

No.	Length
7070-F-12-*	12" (304.8mm)
7070-F-24-*	24" (609.6mm)
7070-F-36-*	36" (914.4mm)

Std. Pk. 1

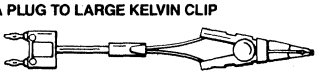


Double Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Coaxial Cable: Shielded RG174/U, MIL-C-17D, 50 Ohm.
***Color Code:** Specify - 0 for Black - 2 for Red Banana Plug moldings. Cable is black only.

STACKABLE DOUBLE BANANA PLUG TO LARGE KELVIN CLIP

No.	Length
7075-C-36-*	36" (914.4mm)

Std. Pk. 1



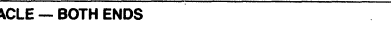
Double Banana Plug features exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Coaxial Cable: Shielded RG58C/U, MIL-C-17F, 50 Ohm.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.

The Kelvin clip is used for 4-wire resistance measurement systems. The two jaws of a Kelvin clip are electrically isolated from each other when open and shorted to each other through the component lead under test when closed. One jaw provides a current path for the source while the other provides a circuit path for the sense.
***Color Code:** Specify - 0 for Black - 2 for Red Banana Plug moldings. Cable is black only.

.025 SQUARE PIN RECEPTACLE — BOTH ENDS

No.	Length
8080-E-6-*	6" (152.4mm)
8080-E-12-*	12" (304.8mm)
8080-E-24-*	24" (609.6mm)
8080-E-36-*	36" (914.4mm)

Std. Pk. 1

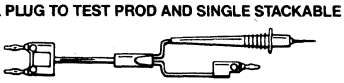


A patch cord for P.C. Boards with .025" (0.64mm) square pins.
Pin Receptacle: .025" (0.64mm) Copper-Nickel-Tin Alloy 725 with .000030" Gold Contact Plating. Housing is ABS.
Hook-up Wire: 19/34 #22 AWG tinned copper with 105°C. PVC insulation.
Color Code: Specify - 0 for Black - 2 for Red.

STACKABLE DOUBLE BANANA PLUG TO TEST PROD AND SINGLE STACKABLE BANANA PLUG

No.	Length
702041-C-36-*	36" (914.4mm)

Std. Pk. 1



Banana Plugs feature exclusive nine-leaf beryllium copper, nickel-plated spring for positive contact with minimum resistance. Multiple stacking feature simplifies circuit connections and changes.
Multiple Feature Test Prods offer adaptability for test lead requirements. Prod handle (4") features molded ABS plastic with anti-slip ribs for a sure grip. Nickel-plated 8-32 threaded brass insert (alloy 360) with stainless steel (type 410) needle accepts accessory options.
Coaxial Cable: Shielded RG 58C/U, MIL-C-17F, 50 Ohm.
Hook-up Wire: 41/36 #20 AWG tinned copper with 105°C. PVC insulation.
***Color Code:** Specify - 0 for Black - 2 for Red Banana Plugs and Prod moldings. Cable is black only.

Mueller *A COMPLETE LINE OF ELECTRICAL and ELECTRONIC TEST ACCESSORIES*
1583 E. 31st St., Cleveland, Ohio 44114, U.S.A.
Telephone: (216) 771-5225 - FAX: (216) 771-3068 - Telex 288845 Mueler

"CLIPPER" PLUNGER-TYPE TEST CLIPS

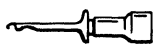
No.	Length	Color
201	44.45 mm (1.75")	Specify color: Red, black.
202	63.50 mm (2.5")	
203	88.90 mm (3.5")	
205	127.00 mm (5")	

Std. Pk. 12

"Clipper" test clips make difficult IC test connections fast and easy. Spring-loaded hook attaches to delicate component leads and terminals to free hands while trouble-shooting and circuit testing. Insulated to a single contact point. Hook retracts into the plastic tip when removed from the contact point to prevent shorting. Interchangeable plunger heads allows hundreds of color combinations for multi-circuit testing.

Plunger Head & Body: Heat and chemical resistant (70% nylon, 30% glass fiber)
One-Piece Blade Conductor/Hook: Beryllium copper for maximum heat dissipation. Designed for connection over component leads up to .060 inches in diameter (1.52mm).
Spring: Stainless steel compression coil.

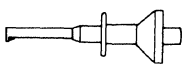
NO. 208 "MINI-MICRO-CLIPPER" PLUNGER-TYPE TEST CLIP



Similar to above "Clipper" but tiny and extremely lightweight. Has a plastic barrier on tip to prevent shorting between DIP legs.
Plunger Head & Body: Nylon.
One-Piece Conductor: Gold-plated beryllium copper, MIL Spec. G45204. For connection to component leads up to .025" dia.

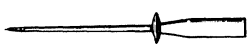
Spring: Stainless Steel Compression coil.
Colors: Black and Red.

NO. 207 PLUNGER-TYPE CLIP ADAPTOR



Spring-Loaded Hook threads (8-32) on tip of multiple feature test prod.
Stem Body is molded from nylon 6/6 material. Features nickel-plated brass insert with silver-coated beryllium conductor. Overall length 2½". Available only in Red, Black.

NO. 3930 "ULTRA-TECH" TEST PRODS

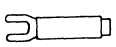


Accepts ULTRA-FLEX Test Leads and other 4mm banana plug terminated leads. Features lightweight, thermoplastic insulation. Polished stainless steel tip provides positive contact up to 1000V during test procedures. Square design and safety shock guard collar provides positive contact accuracy.

Prod Handle: Fully insulated thermoplastic PVC
Probe: Brass, nickel plated
Probe Tip: Polished stainless steel
Mechanical Connection: 4mm brass, nickel plated banana jack.

Shock Guard: 16mm x 16mm (0.630" x 0.630"), thickness
Collar: 5mm-8mm (0.197"-0.315")
Rating: 1000V nominal
Length: 130mm (5.118") overall
Specify Color: Red, Black, Yellow, Blue, Green or Violet
Std. Pk.: 12

NO. 225 SPADE LUG

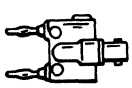


Threads (8-32) on tip of multiple feature test prod for #10 screw terminal connection. Flame retardant ABS plastic. Overall length 1½" Available only in red and black.

NO. 230 INSULATOR EXTENSION

threads on test prod tip to eliminate arc or shortage. Flame-retardant ABS plastic. Available in red or black.

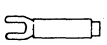
NO. 260 ADAPTOR: BNC FEMALE TO DOUBLE BANANA PLUG



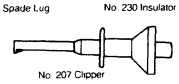
Allows BNC male connector to be used with equipment having banana jacks. Ideal for adapting laboratory VTVM oscilloscopes and signal generator inputs to coaxial cables. .162" (4.11mm) diameter holes in body give side stackable connections.
BNC Female: Tarnish resistant plated brass body, gold-plated brass center contact.
Double Banana Plug: Brass body, beryllium copper nine leaf springs, nickel plated.
Insulation: ABS, black. Std. Pk.: 10

TEST LEADS and KITS

Multiple Feature Test Prods offer adaptability for test lead requirements. Prod handle (4") features molded flame-retardant ABS plastic (V-O rated) with anti-slip ribs for a sure grip. Nickel-plated 8-32 threaded brass insert (alloy 360) with stainless steel (type 410) needle accepts accessory options.


No. 225 Spade Lug

No. 230 Insulator Extension


No. 207 Clipper

No. 60-TBO Clip

No. 62 Insulator

Banana Plugs feature nickel-silver spring to mate with .165" diameter jack for positive contact with minimum resistance.

Hook-up Wire is 65/36 #18 AWG tinned copper with 90°C EPR rubber insulation. 1 red, 1 black per set.

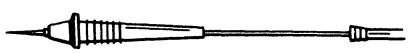
AVAILABLE AS SETS OF 2 TEST LEADS OR AS COMPLETE KITS.

Each Complete Kit Listed Below Contains:
2—48" Test Leads - 1 red, 1 black and the following accessories illustrated at left:
2—No. 207 Clippers (plunger-type clips), 1 red, 1 black
2—No. 225 Spade Lugs, 1 red, 1 black
2—No. 230 Insulator Extensions to cover tip of Test Prod, 1 red, 1 black
2—No. 60-TBO Clips
2—No. 62 Insulators, 1 red, 1 black

SHIELDED BANANA PLUG TO MULTIPLE FEATURE TEST PROD

No.	Length
2141-D-48	48" (1219.2mm)
3918	Complete Kit

Std. Pk. 1 set



RIGHT ANGLE SHIELDED BANANA PLUG TO MULTIPLE FEATURE TEST PROD

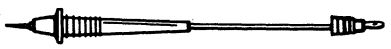
No.	Length
2241-D-48	48" (1219.2mm)
3916	Complete Kit

Std. Pk. 1 set

UNSHIELDED BANANA PLUG TO MULTIPLE FEATURE TEST PROD

No.	Length
2641-D-48	48" (1219.2mm)
3917	Complete Kit

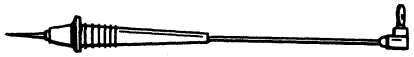
Std. Pk. 1 set



RIGHT ANGLE UNSHIELDED BANANA PLUG TO MULTIPLE FEATURE TEST PROD

No.	Length
2741-D-48	48" (1219.2mm)
3915	Complete Kit

Std. Pk. 1 set



MODULAR OSCILLOSCOPE PROBE KITS

Mueller oscilloscope probes are of modular construction and designed to fit all major brand scopes. The coaxial cable is detachable from both the BNC male connector and the probe. This feature allows for easy field replacement. Additional features on all probes include:

- Coaxial cable consisting of nichrome center conductor, TFE* teflon dielectric core, tinned copper shield and non-contaminating PVC jacket.
- BNC male connector constructed with a silver plated copper center contact and nickel plated brass body.
- The probe contains a nickel plated brass body housed in type 6 nylon. The fully detachable threaded tip is made of nickel plated beryllium copper.
- M12SW and M12X10 probes feature a 250 MHz bandwidth offering superior pulse fidelity.

Mueller provides three models covering most applications. The modular switch probe M12SW allows for X1 and X10 attenuations and is designed for exceptional value. The models M12X10 and M12X1 are designed for dedicated applications.

* Trademark of the DuPont Company

NO. 3910 OSCILLOSCOPE ACCESSORY KIT

Each probe model comes complete with #3910 accessory kit and includes the following:

(1) Ground lead - 6" long. #22 wire (700 CMA) with silicone rubber insulation. Nickel plated copper clip with PVC insulator.

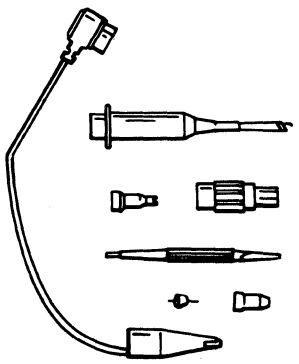
(1) Spare probe tip - silver plated - beryllium copper.

(1) Plunger clip-conductor is nickel plated phosphor bronze. Housing is acetal.

(1) BNC male to probe tip female adaptor - contains a nickel plated beryllium copper outer conductor and silver plated beryllium copper center contact. Acetal dielectric and type 6 nylon housing.

(2) Probe tip shields - to minimize possible shorting in dense areas.

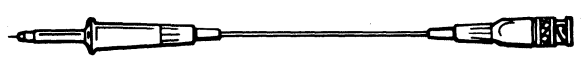
(1) Adjustment screwdriver - used for models M12SW and M12X10 only.



NO. M12X1 MODULAR X1 PROBE WITH 3910 ACCESSORY KIT

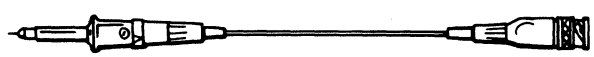
SPECIFICATIONS
Attenuation Ratio: 1:1
Bandwidth: DC-30 MHz
Rise Time: 11 n sec
Input Capacitance: 45 pF + Oscilloscope Input Capacitance
Input Resistance: 1 MΩ (Oscilloscope Input)
Maximum Input Voltage: 600 Volts DC including peak AC
Working Temperature Range: -25 to + 70°C
Cable Length: 1.2 Meters (47.2")
Color: Light Grey

NO. M12X10 MODULAR X10 PROBE WITH 3910 ACCESSORY KIT



SPECIFICATIONS
Attenuation Ratio: 10:1
Bandwidth: DC-250 MHz
Rise Time: 1.4 n sec
Input Capacitance: Nominal 16 pF
Compensating Range: 10-60 pF
Input Resistance: 10 MΩ when used with oscilloscopes which have 1 MΩ Input. (Probe resistance is 9 MΩ ± 1%)
Maximum Input Voltage: 600 Volts DC including peak AC, derating with frequency
Working Temperature Range: -25 to + 70°C
Cable Length: 1.2 Meters (47.2")
Color: Blue

NO. M12SW MODULAR SWITCH SELECTABLE X1/X10 PROBE WITH 3910 ACCESSORY KIT



SPECIFICATIONS
X10 POSITION
Attenuation Ratio: 10:1
Bandwidth: DC-250 MHz
Rise Time: 1.4 n sec
Input Capacitance: Nominal 18 pF
Compensating Range: 10-60 pF
Input Resistance: 10 MΩ when used with oscilloscopes which have 1 MΩ Input. (Probe resistance is 9 MΩ ± 1%)

X1 POSITION
Attenuation Ratio: 1:1
Bandwidth: DC-10 MHz
Rise Time: 35 n sec
Input Capacitance: 40 pF + Oscilloscope Input Capacitance
Input Resistance: 1 MΩ (Oscilloscope Input)
Maximum Input Voltage: 600 Volts DC including peak AC, derating with frequency
Working Temperature Range: -25 to + 70°C
Cable Length: 1.2 Meters (47.2")
Color: Black

CONNECTOR ACCESSORIES, INC.
A Subsidiary of Mueller Electric Company
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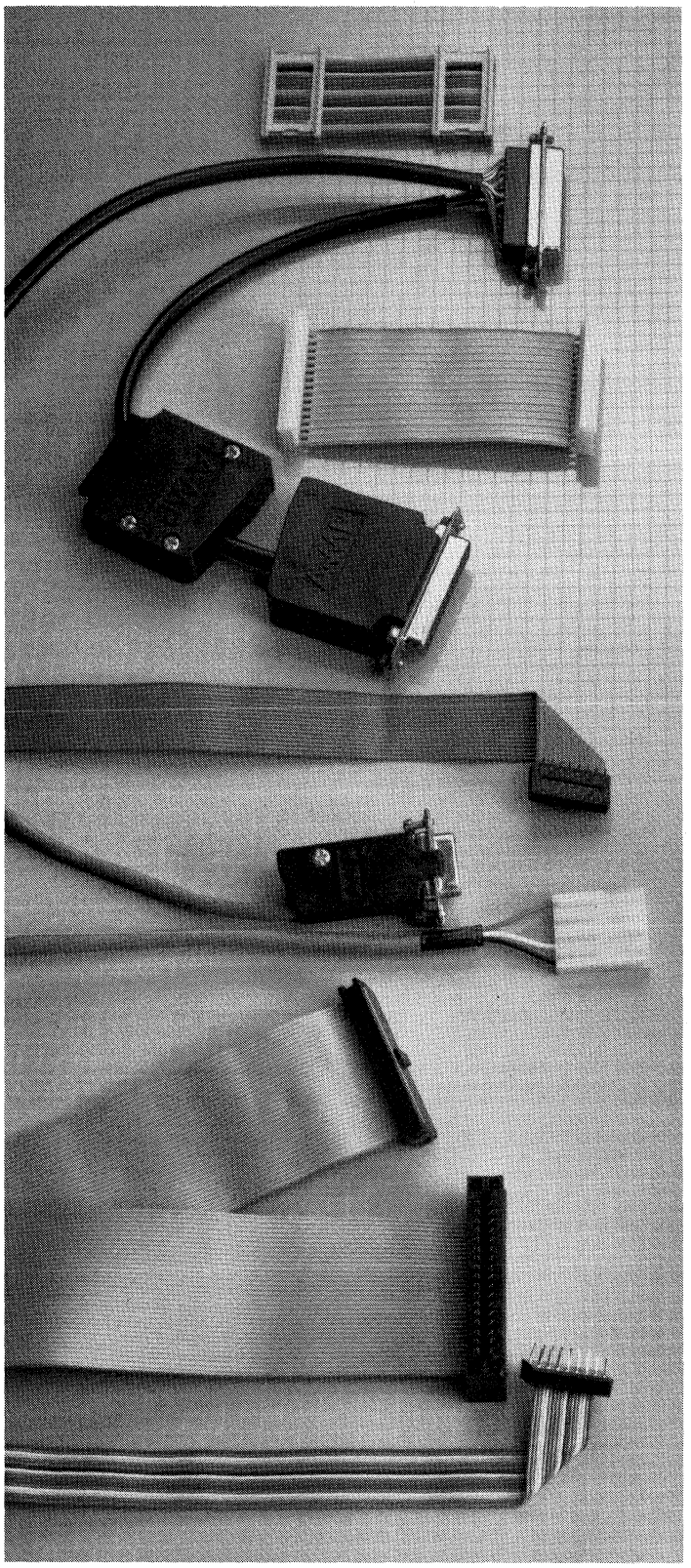

Custom Cable & Wire Assemblies

Connector Accessories, Inc., is a primary supplier of hard-wired cables and assemblies meeting Industrial or Mil Spec requirements. CAI provides value-added cables, cable kits, wire, connectors, pins, hoods, custom cables and cable insulations to the largest OEM manufacturers as well as to fledgling companies. Whatever your company's size, you can rely on CAI for cable assemblies utilizing virtually any UL or CSA connector, including these:

- Edgecard connectors
- CPC connectors
- Ribbon cable termination connectors
- Molded connectors
- Modular plugs and jacks
- D-Sub, RS 232 High-Density connectors
- Fiber Optic DNP connectors
- Parallel interface connectors (Centronics)
- Bus and Tag cables
- BNC series coaxial N, F connectors (RG 62,59)
- RF connectors
- MODU™
- DIN and Mini-DIN connectors (AppleTalk, LocalTalk)
- Female header pin grid array sockets
- Solderless lugs, spade and ring terminals, etc.

You name it, you'll get it from CAI. Any size, any configuration. Simple or exotic. Meeting the entire range of standards, from industrial through Mil Spec. To your sample or drawing, or we will design it with you.

CABLE ASSEMBLIES

CAI applies innovative technical engineering concepts to the production of voice, data and power cable assemblies. We also add value to any cable transferring light or energy through non-mechanical means with thermoplastic moldings and coatings, such as:

- Transfer Molding
- Injection Molding
- Insert Molding
- Shuttle Molding
- Resin Dipping
- Environmental Sealing

CAI's abilities to incorporate plastic molding materials in cable assemblies is limited only by the availability of the material. We are experienced in handling all common (and most special) materials, and in any color you choose.

MODU™ • Registered Trademark of AMP.

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As well as being equipped to handle high-volume orders, we also are an ideal source for your prototype units and sample runs, without the need for long-term committments. Further, we handle short runs of out-of-production cable assemblies.

WHAT ALL THIS MEANS TO YOU:
Because of all the things we can do for you, there's hardly anything you need to do except call us. You don't have to hire skilled labor to produce Zero-defect crimping, soldering, splicing and similar work that puts a new meaning on the term "labor intensive." You don't have to go through the expensive bell-curve of on-the-job training. And you avoid putting your Purchasing Agents through a wringer trying to source each part, checking item-by-item with Engineering to insure compatability. In short, you keep your bottom line where it's supposed to be.

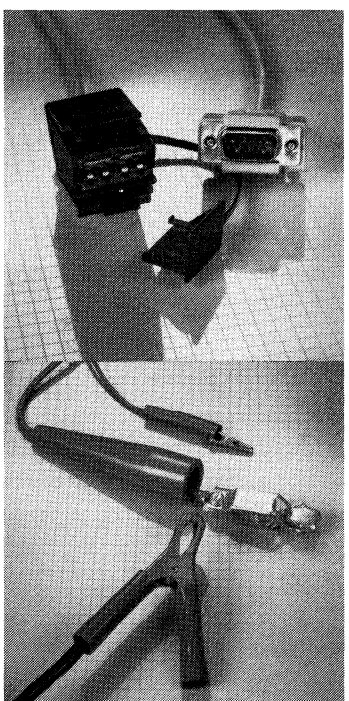
QUALITY ASSURANCE:
Our Statistical Process Control system starts with incoming raw material and extends through everything else we do, including 100% testing and inspection. Every cable is both static and dynamic tested on CAI's computerized, state-of-the-art test equipment. Our SPC system takes the worry out of how well cable assemblies operate on the equipment.

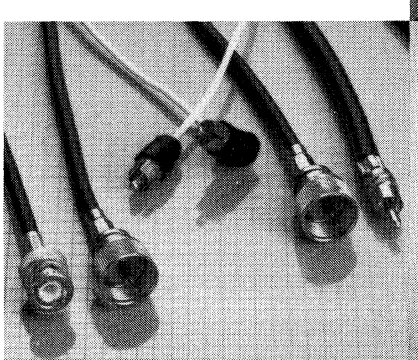
MULTI-DIAMETER CRIMPING:
With CAI's versatile crimping equipment, we offer a wide range of wire and cable crimped to an even greater range of electronic connectors. We have the flexibility to choose the best technique for the job to be done, from sophisticated machine terminators to simple hand tools, using 4/0 to 40AWG, fiber optics, ribbon, flat, round, etc.

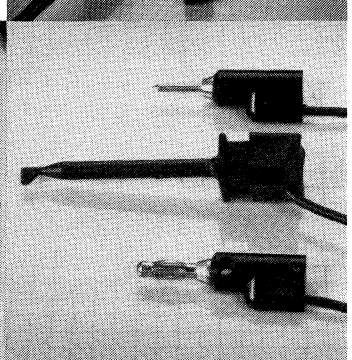
AUTOMATIC WIRE CUTTING AND STRIPPING MACHINERY:
CAI's wire cutting/stripping machines produce precisely-measured, cut and stripped wire in many lengths. Our high-speed machines handle single and twin conductor wire. They can be quickly adapted to work with virtually any standard or non-standard wire end arrangement.

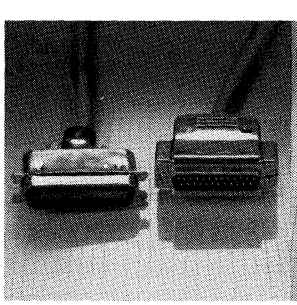
LABELING AND PACKAGING:
We are geared to handle special labeling and imprinting, from industrial bulk quantities to retail packs. Talk to us about your requirements; you'll be pleasantly surprised to hear how practical this service can be for you.

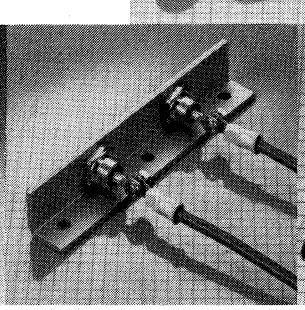
VALUE FOR YOUR MONEY:
We are well aware of how price sensitive this business is. We also know full well how reputation-damaging and just plain expensive cable failure can be when it's on your unit. Because we know both sides of this coin, we make sure you get the quality level you must have without a penalty in price.

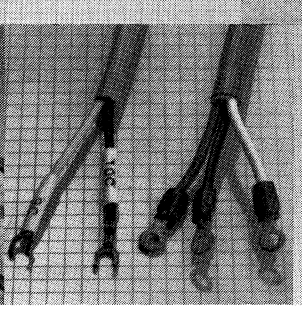


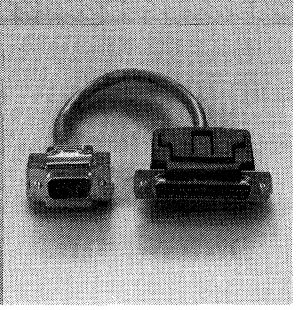












The Industry Performance Standard: Connectors from Multi-Contact.

Outstanding Design. Experienced Manufacturing. Guaranteed Safety. Excellent Quality. Superior Service.

From design to manufacturing, Multi-Contact connectors are produced to satisfy the highest industry standards of performance and reliability.

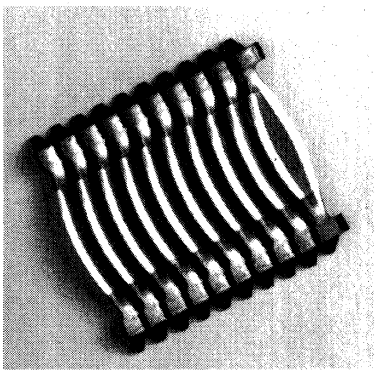
Sophisticated R&D efforts, in-house testing, and stringent quality controls have one simple, critical result: State-of-the-industry connector technology.

Multi-Contact connectors are made from solid brass (CuZn40Pb2), first nickel plated, then sealed with either a hard gold or hard silver plating.

MC-MULTILAM™ connectors exemplify Multi-Contact's innovative technology and commitment to quality. The precision, multiple louvered contact interface assures optimum contact performance. The MC-MULTILAM™ contact band is made from beryllium-copper, precision-stamped and tempered, then hard gold- or hard silver-plated.

MC-MULTILAM™ connectors can be used for unlimited applications due to their design flexibility and advanced features:

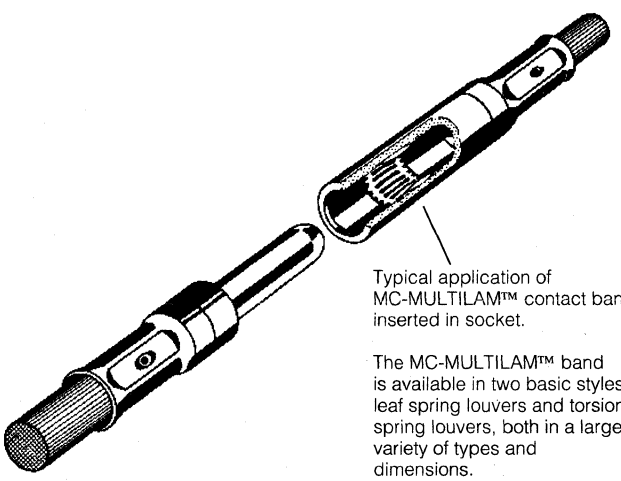
- High contact pressure—yet low insertion force
- High specific current capacity
- Lowest contact resistance
- Low voltage drop—minimal heat rise
- Mechanical strength—tens of thousands of mating operation
- Precious metal plating—excellent corrosion protection, even in aggressive and hostile environments



The MC-MULTILAM™ System...

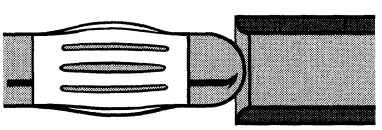
...efficient solutions for all applications.

MC-MULTILAM™ contact band with overlapping, silver-inlaid torsion spring louvers for high current connectors.

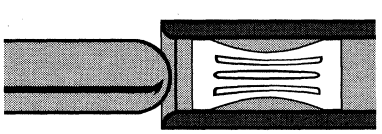


Typical application of MC-MULTILAM™ contact band inserted in socket.

The MC-MULTILAM™ band is available in two basic styles: leaf spring louvers and torsion spring louvers, both in a large variety of types and dimensions.



MC-MULTILAM™ contact band convex-fitted to plug



MC-MULTILAM™ contact band concave-inserted into socket

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SANTA ROSA, CA 95401
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FAX: 707-575-7573
TLX: 510-744-2109

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From Low Current to High Current: Always the Right Connector.*

*If we don't have it on the shelf, we can custom design it.

Comprehensive Selection. Ongoing Innovation. Reliable Service.

Multi-Contact offers connectors for virtually any low or high current application—from signal currents to kilo-amperes. The stock includes connectors in a wide variety of sizes, configurations, dimensions and colors. In addition to this wide range of standard products, Multi-Contact offers assembly of stock parts to customer specifications.

True Custom Design.

New designs often demand novel components for optimum performance. Over many years, Multi-Contact has established an enviable record of successful custom-engineered and produced connectors that have satisfied numerous electronic and electrical applications. First-hand experience in conjunction with knowledge of the industry makes Multi-Contact an ideal source for customers needing specific or unique solutions. Very low minimum quantities are required: An average of only 200 units for custom-assembled products, only 3,000 units for custom-produced units.

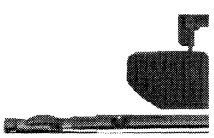
However, regardless of how unusual or complicated the newly custom produced unit may be, it still carries the guarantee of top performance and unsurpassed reliability.

Connectors for PCB's in 0.5,0.8,1.0 and 2.0 mm Dia.

Low Current Connectors and Accessories

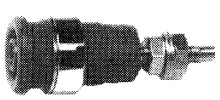
Connecting plugs in 1.0 , 2.0 and 4.0 mm Dia.

MC-MULTILAM plugs



Test plugs with separate insulations

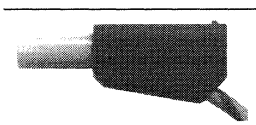
Test leads in 7 lengths and 10 colors



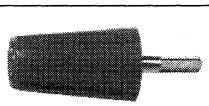
Sockets for power supplies

Safety Connectors and Accessories UL Listed

Touchproof connecting plugs



Touchproof test leads



Adaptors to safety systems

Test leads with retractable safety-sleeve

Safety-engineered probes and tips

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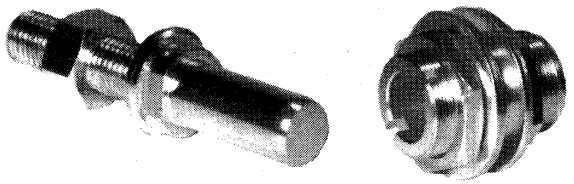
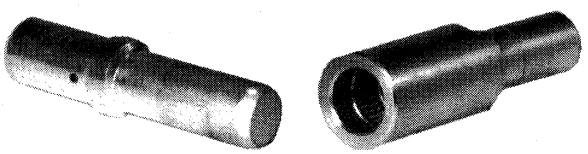
From High Current to Low Current: Always the Right Connector.*

* If we don't have it on the shelf, we can custom design it.

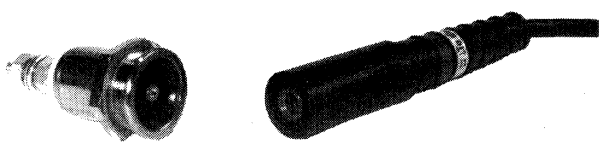


Plugs and sockets with external threads
for connection to bus bars
from 10 to 5000 Amps

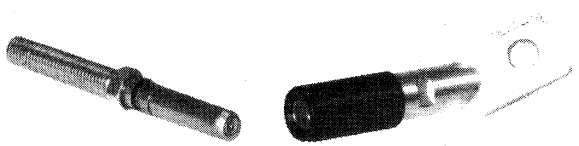
High Current Contact Devices



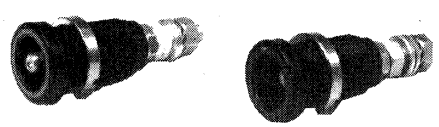
Plugs and sockets with rear copper sleeves
for crimp connections
from 10 to 2500 Amps



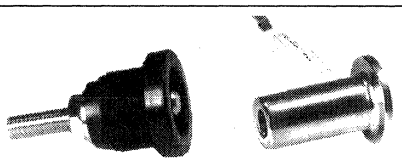
Panel-mount and cable in-line connectors
for 180 and 280 Amps
with quick lock device



Plugs with threaded studs and sockets
with spade-lug rear connections
from 90 to 280 Amps
with quick lock device

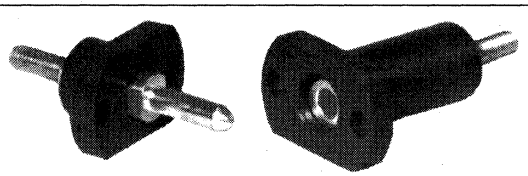


Insulated, color-coded panel-mount
plugs and sockets
for 90 Amps
with quick lock device



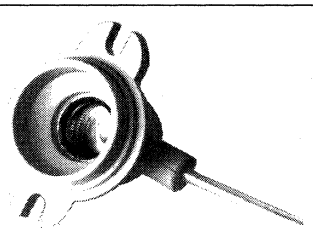
Rotating grounding connectors
for medical environments

Equipotential Grounding Connectors



Custom connectors made from
tellurium-copper with floating contacts

Custom Designs



Custom connector for high temperature
applications

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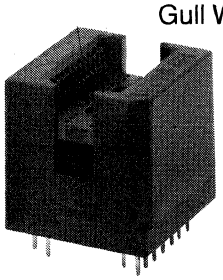
High Quality Test & Burn-in Chip Carrier Sockets with Low Real Estate Requirements

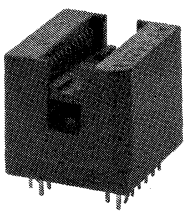
- Small Real Estate Use - - - - - -High productivity with denser spacing on burn-in boards
- Contacts Wipe on Insertion - - -Good electrical contact - 100% of the time
- Top Loading Design - - - - - - - -Loading easy to automate
- Positive Ejection Unload - - - - -Unloading easy to automate
- High Temperature Polymers - - Withstand burn-in operating temperatures to 150°C and Contact Alloys

Small Outline Gull Wing Sockets



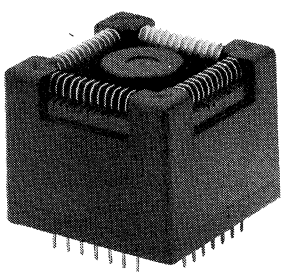
Lead Count	Order Item#	Thickness	Length	Width	JEDEC #
SOG - 08	000343	.061"	.193"	.236"	MS - 012AA
SOG - 14	000351	.061"	.340"	.236"	MS - 012AB
SOG - 16 - .150"	000416	.061"	.390"	.236"	MS - 012AC
SOG - 16 - .300"	000432	.098"	.405"	.407"	MS - 013AA
SOG - 18	000513	.098"	.455"	.407"	MS - 013AB
SOG - 20	000370	.098"	.505"	.407"	MA - 013AC
SOG - 24	000371	.098"	.605	.407"	MS - 013AD
SOG - 28	000374	.098"	.705	.407"	MS - 013AE

Small Outline "J" Lead Sockets



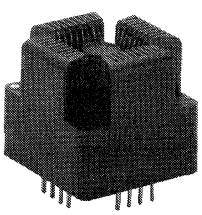
Lead Count	Order Item#	Thickness	Length	Width	JEDEC #
SOJ - 16	000399	.120"	.425"	.340"	
SOJ - 20	000520	.120"	.525"	.340"	
SOJ - 24	001881	.120"	.625"	.340"	
SOJ - 26	000431	.120"	.675"	.340"	MO - 077AA
SOJ - 28	000373	.120"	.725"	.340"	

Plastic Leaded Chip Carrier Sockets



Lead Count	Order Item#	Thickness	Length	Width	JEDEC #
PLCC - 18	000078	.120"	.462"	.322"	MO - 052AA Rect.
PLCC - 20	000258	.173"	.390"	.390"	MO - 042AA Sq.
PLCC - 22	000173	.120"	.5275"	.3275"	MO - 052AC
PLCC - 28	000273	.173"	.490"	.490"	MO - 047AB Sq.
PLCC - 32	000366	.120"	.590"	.490"	MO - 052AE Rect.
PLCC - 44	000098	.173"	.690"	.690"	MO - 047AC Sq.
PLCC - 52	000157	.183"	.790"	.790"	MO - 047AD Sq.
PLCC - 68	000419	.183"	.990"	.990"	MO - 047AE Sq.
PLCC - 84	000167	.183"	1.190" "	1.190"	MO - 047AF Sq.

Leadless Ceramic Chip Carrier Sockets



Lead Count	Order Item#	Thickness	Length	Width	JEDEC #
LCC - 18	000063	.060"	.425"	.290"	.050" Center
LCC - 20	000047	.060"	.350"	.350"	MS - 004CB
LCC - 24	000072	.060"	.400"	.400"	.050" Center
LCC - 28	000057	.060"	.450"	.450"	MS - 004CC
LCC - 32	000085	.060"	.420"	.420"	.040" Center
LCC - 44	000511	.060"	.650"	.650"	.050" Center

New, Low Insertion Force Design

Lead Count	Order Item #	Thickness	Length	Width
PLCC - 68	001911	.180"	.990"	.990"
SOJ - 28	001895	.120"	.725"	.340"

We manufacture custom burn-in and test sockets - call with your designs. The J. M. Ney Company is a major manufacturer of precious metal alloys, low energy electrical contacts, test & burn-in sockets and electronic products. Please see our ads under Contacts, Electrical (Sec. 2500) and Services, Molding (Sec. 4100).

*All Dimensions are nominal.

Since 1812

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The J. M. Ney Company
Electronics Division
Ney Industrial Park, Bloomfield, Connecticut 06002
PHONE: 203/286-6149 • FAX: 203/242-5688

WIRE GAUGES— DIAMETER, AREA AND COPPER WEIGHT

	Diameter at 20°C (68°F)		Area at 20°C (68°F)			Weight at 20°C (68°F), bare copper wire		
Size, AWG	mils	mm	mils	c mils	mm	lb/1,000 ft.	lb/mile	kg/km
4/0	460.0	11.68	166,200	211,600	107.2	640.5	3,382	953.2
3/0	409.6	10.40	131,800	167,800	85.01	507.8	2,681	755.7
2/0	364.8	9.266	104,500	133,100	67.43	402.8	2,127	599.5
1/0	324.9	8.252	82,891	105,600	53.49	319.5	1,687	477.6
1	289.3	7.348	85,730	83,690	42.41	253.3	1,338	337.0
2	257.6	6.543	52,120	66,360	33.62	200.9	1,061	298.9
3	229.4	5.827	41,330	52,620	26.67	159.3	841.1	237.1
4	204.3	5.189	32,780	41,740	21.15	126.3	667.1	188.0
5	181.9	4.620	25,990	33,090	16.77	100.2	528.8	149.0
6	162.0	4.115	20,610	26,240	13.30	79.44	419.4	118.2
7	144.3	3.665	16,350	20,820	10.55	63.03	332.8	93.80
8	128.5	3.264	12,970	16,510	8.367	49.98	263.9	74.38
9	114.4	2.906	10,280	13,090	6.631	39.61	209.2	58.95
10	101.9	2.588	8,155	10,380	5.261	31.43	166.0	46.77
11	90.7	2.304	6,460	8,230	4.17	24.90	131	37.1
12	80	2.05	5,130	6,530	3.310	19.8	104	29.4
13	72.0	1.83	4,070	5,180	2.63	15.7	82.9	23.4
14	64.1	1.63	3,230	4,110	2.08	12.4	65.7	18.5
15	57.1	1.45	2,560	3,260	1.650	9.87	52.1	14.7
16	50.8	1.29	2,030	2,580	1.31	7.81	41.2	11.6
17	45.3	1.150	1,610	2,050	1.040	6.21	32.8	9.24
18	40.3	1.02	1,280	1,620	0.823	4.92	26.0	7.32
19	35.9	0.912	1,010	1,290	0.653	3.90	20.6	5.81
20	32.0	0.813	804.0	1,020	0.519	3.10	16.4	4.61
21	28.5	0.724	638.0	812.0	0.412	2.46	13.0	3.66
22	25.3	0.643	503.0	640.0	0.324	1.94	10.2	2.88
23	22.6	0.574	401.0	511.0	0.259	1.55	8.16	2.30
24	20.1	0.511	317.0	404.0	0.205	1.22	6.46	1.82
25	17.9	0.455	252.0	320.0	0.162	0.970	5.12	1.44
26	15.9	0.404	199.0	253.0	0.128	0.765	4.04	1.14
27	14.2	0.361	158.0	202.0	0.102	0.610	3.22	0.908
28	12.6	0.320	125	159.0	0.0804	0.481	2.54	0.715
29	11.3	0.287	100.0	128.0	0.0647	0.387	2.04	0.575
30	10.0	0.254	78.50	100.0	0.0507	0.303	1.60	0.450
31	8.9	0.226	62.20	79.2	0.0401	0.240	1.27	0.357
32	8.0	0.203	50.30	64.0	0.0324	0.194	1.02	0.288
33	7.1	0.180	39.60	50.40	0.0255	0.153	0.806	0.227
34	6.3	0.160	31.20	39.7	0.0201	0.120	0.634	0.179
35	5.6	0.142	24.60	31.4	0.0159	0.0940	0.501	0.141
36	5.0	0.127	19.60	25.00	0.0127	0.0757	0.400	0.113
37	4.50	0.114	15.90	20.20	0.0103	0.0613	0.324	0.0912
38	4.0	0.102	12.60	16.0	0.00811	0.0484	0.256	0.0721
39	3.5	0.0889	9.62	12.2	0.00621	0.0371	0.196	0.0552
40	3.1	0.0787	7.55	9.61	0.00487	0.0291	0.154	0.0433
41	2.8	0.0711	6.16	7.84	0.00397	0.0237	0.125	0.0353
42	2.5	0.0635	4.91	6.25	0.00317	0.0189	0.0999	0.0282
43	2.2	0.0559	3.80	4.84	0.00245	0.0147	0.0774	0.0218
44	2.0	0.0508	3.14	4.00	0.00203	0.0121	0.0639	0.0180
45	1.8	0.0457	2.54	3.24	0.00164	0.00981	0.0519	0.0146
46	1.6	0.0406	2.01	2.56	0.00130	0.00775	0.0409	0.0115
47	1.4	0.0356	1.54	1.96	0.000993	0.00593	0.0313	0.00883
48	1.2	0.0305	1.13	1.44	0.000730	0.00436	0.0230	0.00649
49	1.1	0.0279	0.950	1.21	0.000613	0.00366	0.0193	0.00545
50	1.0	0.0254	0.785	1.00	0.000507	0.00303	0.0160	0.00450

OXLEY TEST POINTS

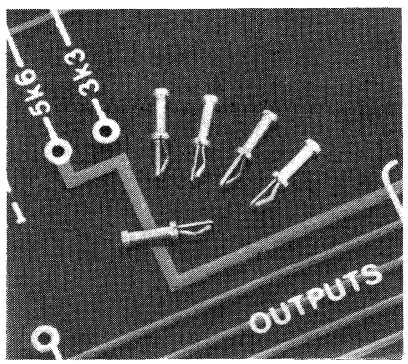
TEST IT!
with KINKY PIN TEST POINTS
Reliably. Efficiently. Economically.

Designed for plated thru hole applications, Oxley's compliant Kinky Pin retention mechanism allows wide hole tolerance. The precision turned pin head prevents a test probe from being dislodged and is available in two lengths for low profile or high density applications. Easily wave or hand soldered into place.

The **OXLEY KINKY PIN test** point connector is a new compliant pin for use in plated through hole (PTH) printed circuit boards.

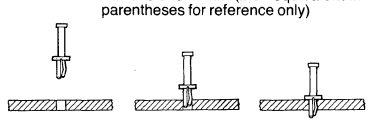
Intended to be used as a test equipment connection point, the precision turned pin head prevents a test probe being dislodged.

An ingenious kinked pin is utilized as a compliant retention mechanism, designed to prevent damage to through-plated holes during insertion while providing sufficient retention for wave or hand soldering.



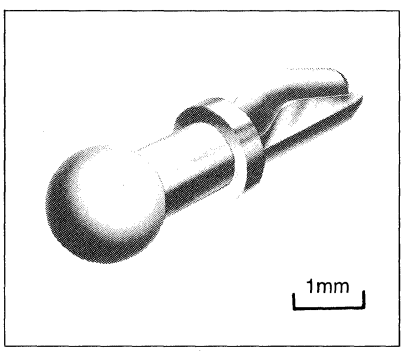
KINKY PIN SELF-LOCKING ASSEMBLY MOUNTING DETAILS
Minimum Board Thickness 1.4mm (.055)

Dimensions in mm (inch equivalent in parentheses for reference only)

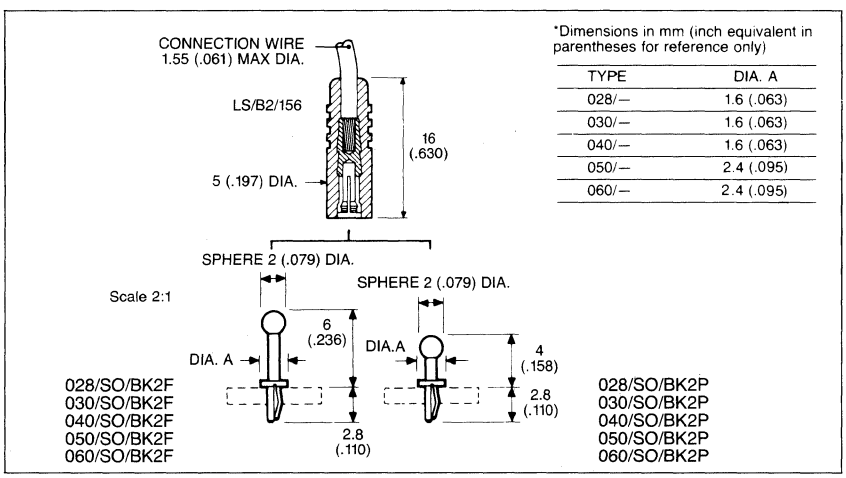


TYPE	Mounting hole diameter after through plating
028/—	0.68 to 0.84mm (.030 ± .003)
030/—	0.81 to 0.96mm (.035 ± .003)
040/—	0.96 to 1.12mm (.041 ± .003)
050/—	1.21 to 1.37mm (.051 ± .003)
060/—	1.50 to 1.65mm (.062 ± .003)

OXLEY SNAPLOX® KINKY PIN CONNECTORS



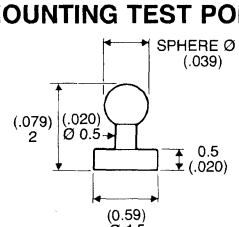
Test Point Connectors with Oxley® Kinky Pin Compliant Retention Mechanism for PTH



*Dimensions in mm (inch equivalent in parentheses for reference only)

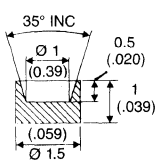
TYPE	DIA. A
028/—	1.6 (.063)
030/—	1.6 (.063)
040/—	1.6 (.063)
050/—	2.4 (.095)
060/—	2.4 (.095)

SURFACE MOUNTING TEST POINTS & PADS



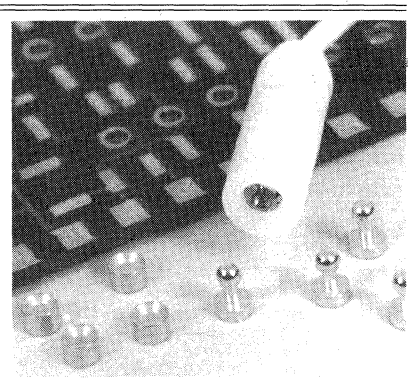
Type No: **SMOX/060/B1**
Surface Mounting
Snaplox Test Point

Mating Connector
Type No: **LS/B1/093**
1mm Snaplox Socket



SMOX/060/TP
Surface Mounting Test Pad

Dimensions in mm.
Inch equivalent in parentheses for reference only
SCALE 6:1



FOR OTHER OXLEY PRODUCTS SEE:
Volume A Section-2750 RFI SUPPRESSION FILTERS, Page A•1715;
B-2440 MILITARY COMPONENTS, Page B•1025; B-2460 INDICATOR LAMPS, Page B•1179

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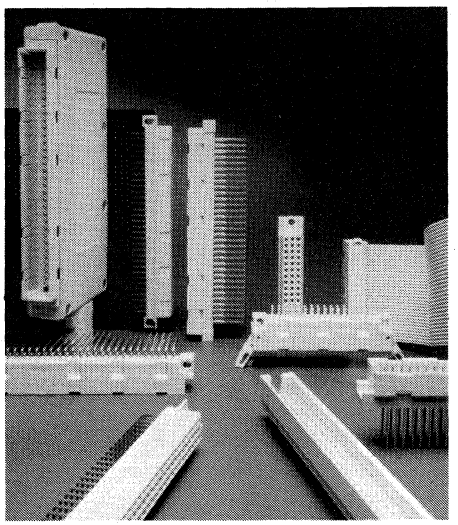
For fast action, FAX us. • FAX (203) 481-6971 • TEL. (203) 488-1033

PANDUIT® HI-CON™ | EUROCARD DIN CONNECTORS

Performance rated to meet all your specific application requirements with maximum cost effectiveness. Standard DIN .100" contact grid. Designed to meet DIN 41612; MIL-C-55302/131, /132, /133, /134; BS 9525 F0004; IEC 603-2; and VG 95324 specifications. HI-CON connectors are also VDE certified. Series 100 compatible with VMEbus P1/P2 or J1/J2, NUBUS, STEbus, FUTUREBUS, CIMBUS and MULTIBUS II.

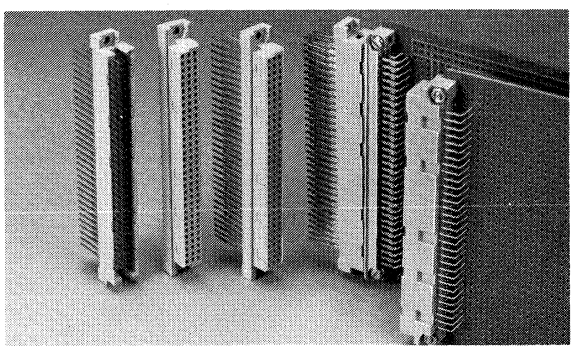


Guaranteed Gold Thickness For Maximum Reliability

New technology and applications have required a continuing evolution of original DIN 41612 product selections. A recent addition of DIN 41612 is the introduction of "Performance Class I, II and III." The chart below shows the PANDUIT guaranteed gold plating that, combined with the performance class, lets you choose the most economical plating and class that's right for your application.

Performance Class	Min. Plating Thickness	Mating Cycles	Harsh Environment Testing
III	8 Microinch	50*	None
II	15 Microinch	400	4 Days
I	Consult Factory	500	21 Days

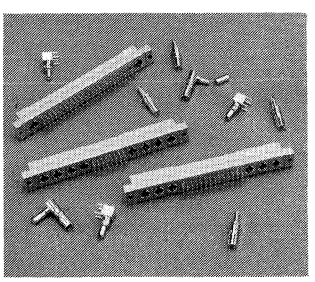
*Panduit testing >200 cycles exceeds DIN requirement

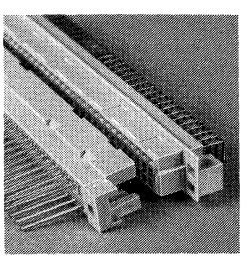


Complete Line of Connectors

Over 15 years manufacturing experience and state-of-the-art equipment combine quality with on- time delivery.

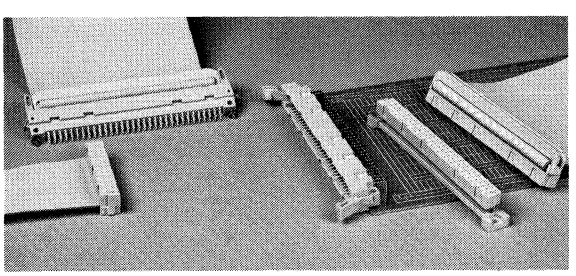
- Series 100/101—Standard DIN 41612—Types B, half B, C, half C, D, E, F; up to 96 pins: two- and three-row versions
- Series 100S—Special Wrap Pins—Type C; up to 96 pins; for interface systems
- Series 105—Mixed Contact—Type M; 16 to 78 pins plus 2 to 8 inserts, including coax, high voltage and high power contacts
- Series 120—Flat Cable—Types B, C, half C; up to 64 pins; for use with .050" flat cable
- Series 130—Inverse—Type R; up to 96 pins; permit mounting lower cost male to backplane
- Series 130—Press Fit—Type R; up to 96 pins: compliant pins replaceable from either front or backplane
- Series 135—Females—Types B, half B, C, half C; up to 96 pins; for building economical backplanes with traditional female units
- Series 136—Stretched Inverse—Type R; up to 195 pins; semi-custom three-row series





Complete Line of Accessories

A variety of accessories and tooling designed to lower your installed cost are available: press fit connector insertion dies; pin alignment tools; front and backplane adapters; coding combs; unique coding wedge system.



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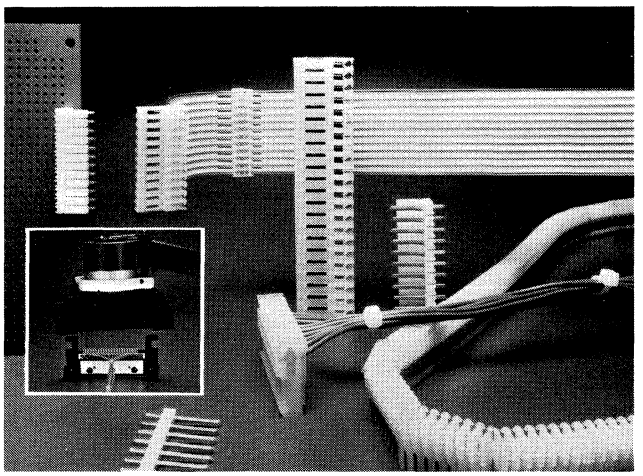
For further information and samples,
Call 1-800-777-3300

PANDUIT® MAS-CON® | MASS-TERMINATED CONNECTORS

Preloaded insulation displacement contacts eliminate wire stripping, manual crimping and hand loading of contacts.

- End and through connectors for discrete wire, notched round conductor flat cable and pre-split ribbon cable
- Industry intermateable and stackable end to end
- Bright acid tin or selective gold over nickel plating
- Housings of 6/6 nylon color coded for wire gauge
- For up to 300 VAC/VDC applications

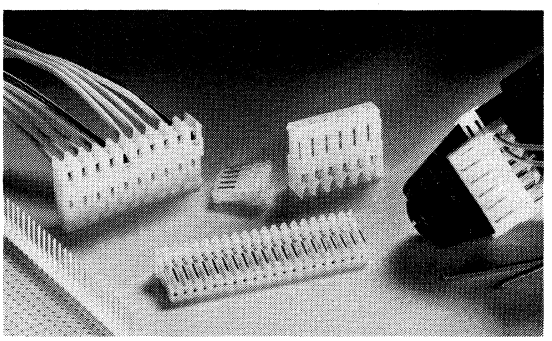


.100″ Centerline Connectors
Rated up to 4 amps with 22 AWG

- 2 through 28 circuit positions
- For 22, 24, 26 and 28 AWG wire

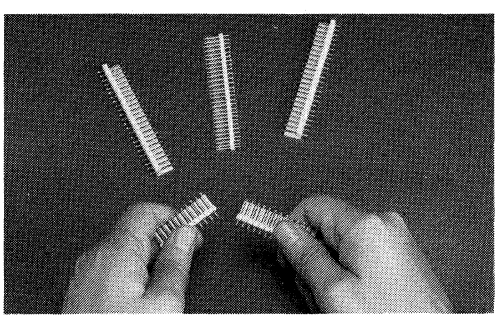
.156″ Centerline Connectors
Rated up to 8 amps with 18 AWG

- 2 through 24 circuit positions
- For 18, 20, 22, 24 and 26 AWG wire



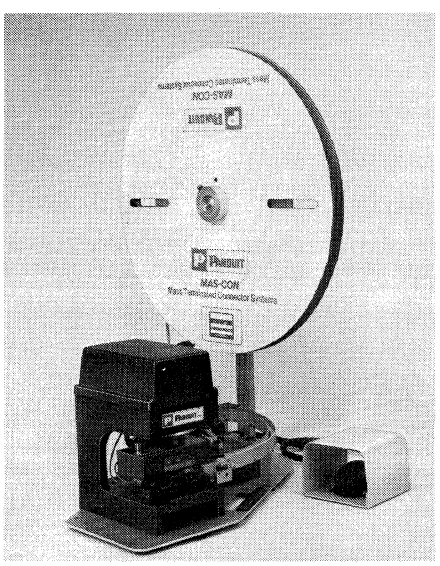
PCB Header Assemblies

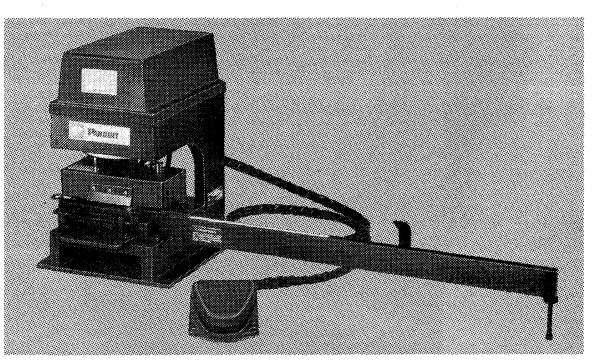
- Straight or angled posts in flat, locking or polarizing types
- .100″ centerline headers have .025″ square posts, offer 2 through 36 circuit positions
- .156″ centerline headers have .045″ square posts, offer 2 through 24 circuit positions



High Efficiency Production Tooling and Accessories Designed to Lower Your Installed Cost

Manual and pneumatic hand tools with interchangeable nose sections for .100″ and .156″ connectors; bench mounts for manual tools; header cutting tools; manual and pneumatic presses; mass termination and flat cable notching die sets; electric single wire termination tools; pneumatic automatic track-fed presses; high volume automatic reel-fed presses; automatic harness assembly machines for up to 33,600 circuit terminations per hour; harness board tooling and accessories.





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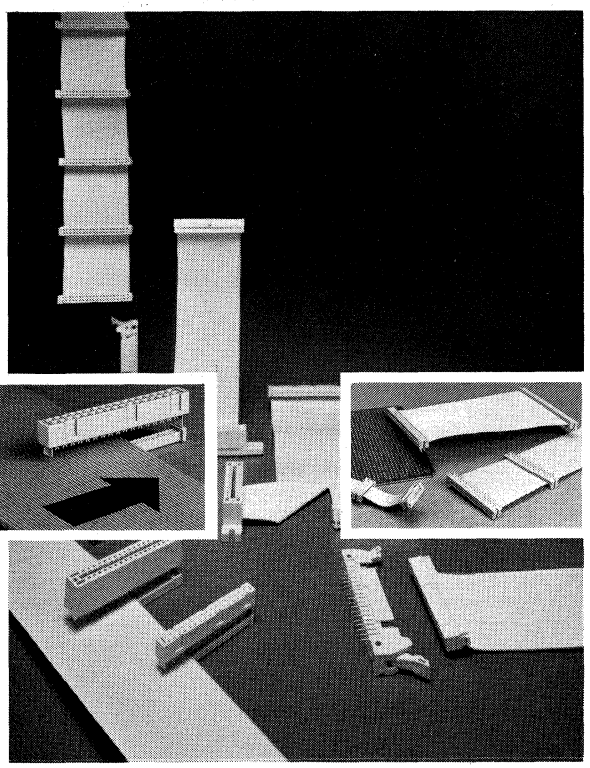
PANDUIT® LAT-CON™ | .050" FLAT CABLE CONNECTORS

- Unique, open-sided connector permits lateral cable insertion
- Cuts installation time up to 75%
- Reduces rework up to 90%
- For end or daisychain terminations
- Unique polarization methods available on sockets and card edge connectors—without loss of contact

Preassembled Sockets
- 10 to 60 circuits
- MIL-C-83503 intermateable

Card Edge Connectors
- 20 to 60 circuits
- Three housing styles

Two-Row Transition Connectors
- For permanent installation on PC board—eliminate need for headers
- 10 to 64 circuits

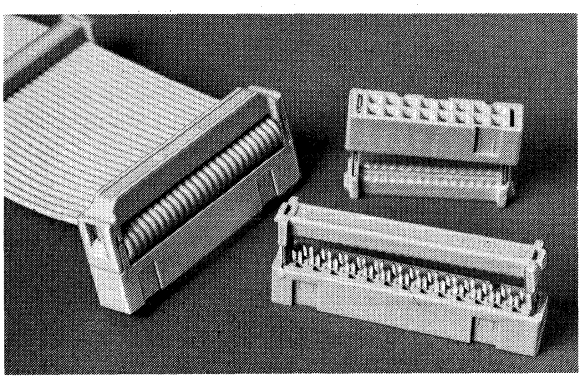


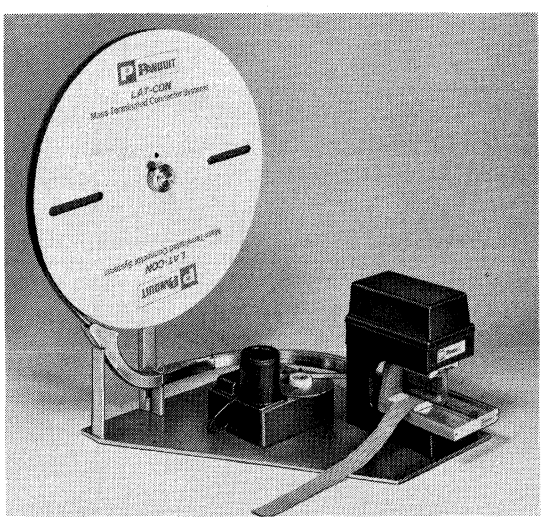
Four-wall headers available for 10 to 64 circuits; .025" square contacts; straight or angled tail; furnished with or without ejector/latch, with MIL spec latch, or with Panduit one-length latch installed. Loose piece MIL spec or one-length latches available.

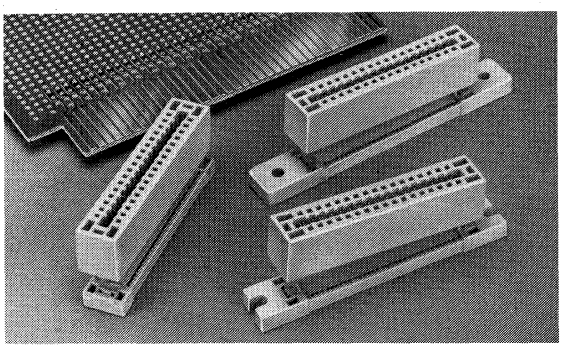
Unshrouded headers available for 10 to 60 circuits; .025" square contacts; right angle or straight pins; tin plated or 15 or 30 μinch gold plated.

Shunts for .100" system; for adjacent .025" square or round posts; female jumpers for unshrouded headers; tin or 15 μinch gold plated.

Lower your installed cost with PANDUIT® tools
Full line of termination tooling; manual tools; manual and pneumatic presses; high volume reel-fed pneumatic presses; header cutting tools.







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NOMOGRAPH VOLTAGE DROP

NOMOGRAPH OF VOLTAGE DROP ACROSS LOAD SUPPLY LEADS
(as a function of wire size and load current)

THIS NOMOGRAPH CAN BE USED TO FIND:

Maximum current carrying capacity recommended for any standard wire size.*

1) With a straight edge, connect from the wire size on Scale 2 to the point "A" on Scale 3.
2) Read I_{max} on Scale 1.

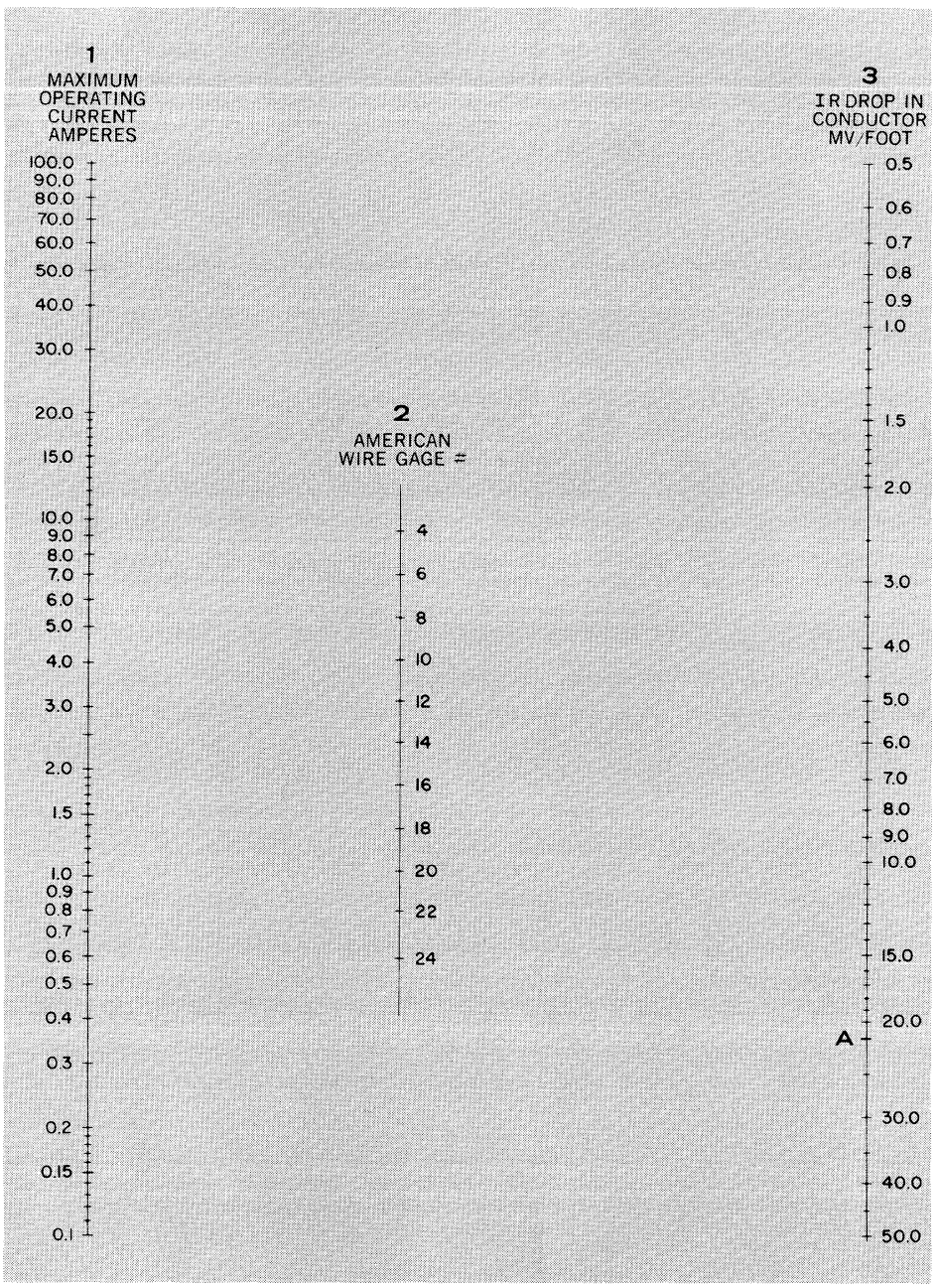
Voltage drop in millivolts per foot for known wire size and operating current.

1) With a straight edge, connect the known current on Scale 1 and the wire size on Scale 2.
2) Read voltage drop on Scale 3.

Wire size required for known operating current and known maximum tolerable voltage drop across supply leads.

1) Determine maximum tolerable drop in millivolts **per foot** of lead (sum of positive and negative leads).
2) Connect the value on Scale 3 (as determined in step 1) to the known current on Scale 1.
3) Read wire size on Scale 2.

* *Based on an arbitrary minimum 500 circular mils per ampere. High-temperature class insulation will safely allow higher currents.*

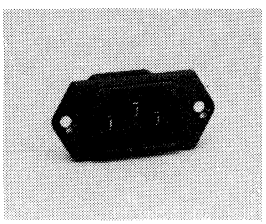


NOTE: A voltage stabilized Power Supply controls the voltage across its output terminals. Hence, the wire conductors used to connect the load must be considered as part of the load. At high load currents, the voltage drop across the supply leads may appreciably degrade stablization at the load. Kepco models equipped with the *remote error sensing* feature can automatically compensate for voltage drops of up to 500 mV across each load supply lead.

IEC 320 Power Inlets & Connectors

65°C 120°C

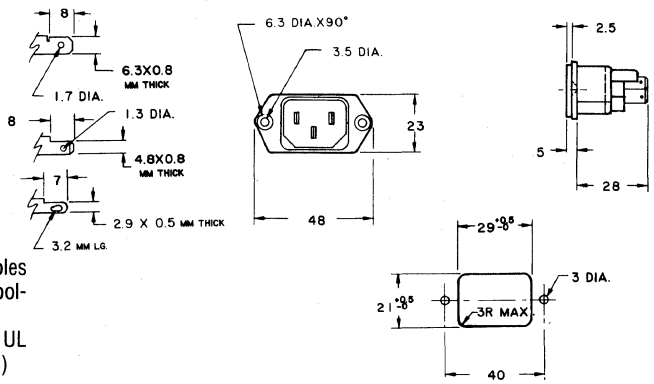
The IEC 320 power inlet is the most commonly used means of connecting a detachable cordset to electrical or electronic equipment that consumes up to 16 amps at 250 volts or less. This standard is used in Europe, North America and throughout the industrialized world. By designing an IEC 320 power inlet into a product, the manufacturer can attach the correct international cordset (e.g., a cordset with a British, Australian, Continental European or North American NEMA plug) just prior to shipment. Note that European voltages and frequencies are typically 220-240VAC (50Hz); see opposite page for modules that combine an IEC 320 power inlet and voltage selector. See following pages for accessory power system based on IEC 320.



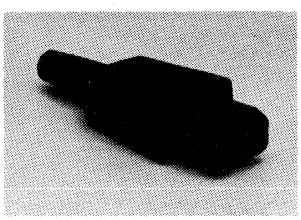
#8843.FSGA.40.60: with 6.3 mm (1/4") solder/Q.D. tabs

#8843.FSM.40.60: with 4.8 mm (.187") solder/Q.D. tabs

#8843.Z.40.60: with soldering tabs

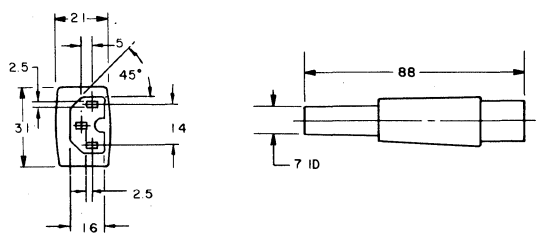


IEC 320 receptacle with three contact styles for use at 65°C. Mounting holes are 40 mm on center. Nickel-plated brass contacts. Insulator molded from polyamide-type thermoplastic.
Approvals: VDE, DEMKO, KEMA, NEMKO, OVE, SEMKO, SEV (6A/250VAC); UL recog. (15A/250VAC); CSA cert. (10A/250VAC; 15A on #8843.FSGA.40.60)



Made-to-order cord assembly services available

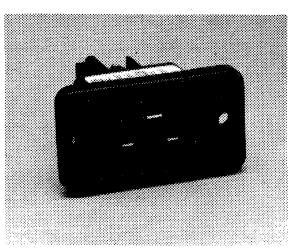
#8943.W.60: "Hot" power cord plug for use at 120°C. Mates with both 6A/65°C and 10A/120°C standard receptacles. Integral cable-clamp strain relief; screw-type connections. Insulator molded from polyamide-type thermoplastic. UL flammability rating: UL-94V-2. Accepts cordage to 9.6mm O.D. max.
Approvals: OVE, SECV, SEMKO, SEV, VDE (10A/250VAC), CSA cert. & UL recog. (15A/250VAC)



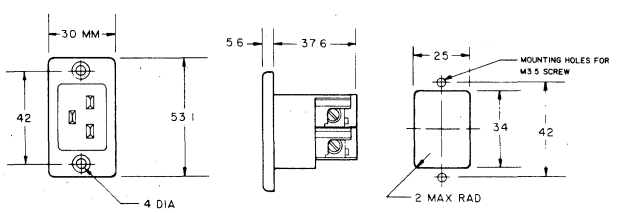
IEC 320 connectors rated at 16/20A

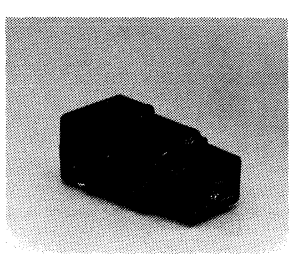
65°C

For computer manufacturers who require a detachable connector system rated at more than 6 or 10 amps. This connector is described in IEC 320, standard sheets C-19 and C-20.

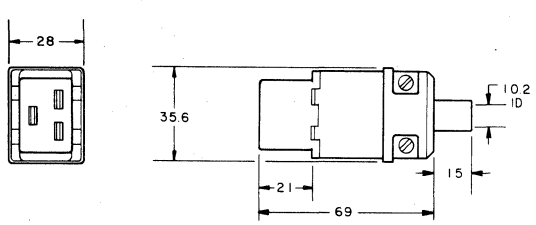


#H320B: Power inlet for use at 65°C rated 20A/250VAC by UL & CSA (UL classified to IEC 320 at 16A/250VAC). Mates with H320C. Nylon insulator. Nickel-plated brass contacts. Screw-type connections.
Approvals: UL recog., CSA cert. (20A/250VAC); TUV (16A/250VAC)





#H320C: Power outlet for use at 65°C rated 20A/250VAC by UL & CSA (UL classified to IEC 320 at 16A/250VAC). Mates with H320B. Nylon insulator. Nickel-plated brass contacts. Screw-type connections.
Approvals: UL recog.; CSA cert. pending (20A/250VAC); TUV (16A/250VAC)



Dimensions are in mm.

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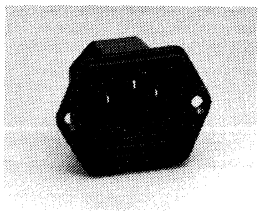
INTERNATIONAL power components • see also Sec. 4050 (Int'l. Power Source) • 4300 (Fuses) • 6000 (Int'l. Cords)

International Multifunction Power Modules

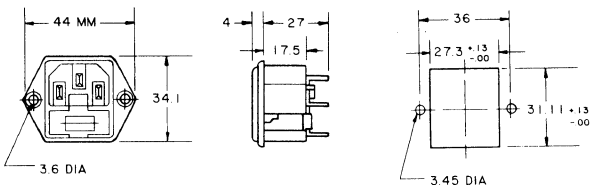
65°C

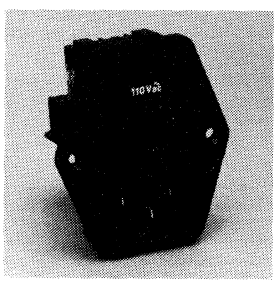
Power modules aid in configuring a product with the correct cordset, voltage, and fusing for international or North American markets, and can also save on space, assembly costs, and components management because several functions are combined in one unit. A power module can also make a product safer; because it is possible to interlock the power entry connector with access to a fuseholder or voltage selector, the equipment user ***must*** remove the power cord before changing a fuse or adjusting a voltage selector.



IEC 320 connector & carrier for 5 x 20 mm fuse

#83110110: Power module for use at 65°C combines IEC 320 connector and fuseholder for 5 x 20 mm fuse.
Approvals: VDE, SEMKO, SEV, UL recog., CSA cert. at 6A/250VAC

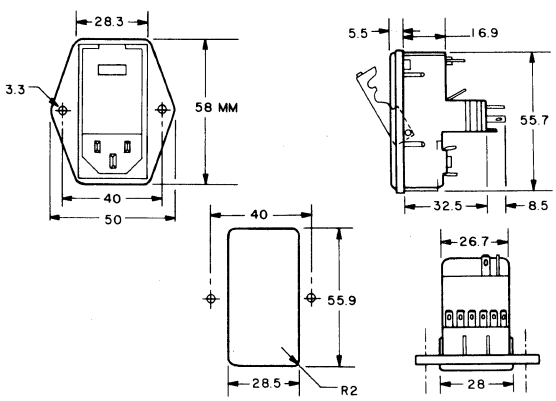


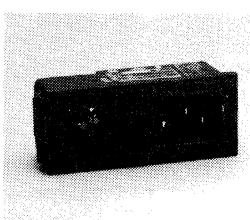


IEC 320 connector, voltage selector, dual size fuse carriers

#83110010: Power module for use at 65°C combines: 1) IEC 320 connector; 2) choice of fuse carrier for No. Amer. 1/4 x 1-1/4" fuse or int'l 5 x 20 mm fuse—carriers and fuses sold separately*; 3) a 4-position voltage selector for 100, 120, 220 & 240 VAC—voltage selector sold separately*
Approvals: UL recog., CSA cert., VDE (Gutachten) at 6A/250VAC

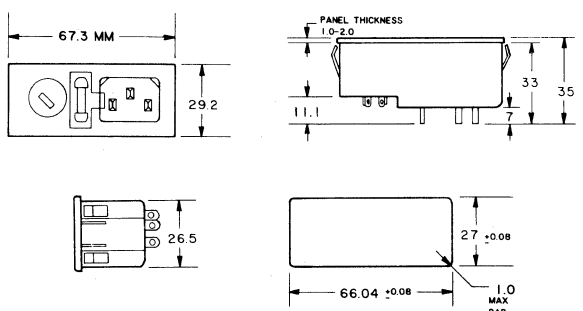
***Sold separately:** Voltage selector wheel: Part #83110060
Fuse carrier: #83110050, 5 x 20 mm fuse
#83110040, 1/4 x 1-1/4" fuse

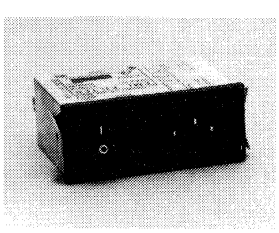




IEC 320 connector, voltage selector, 5 x 20 mm fuse carrier

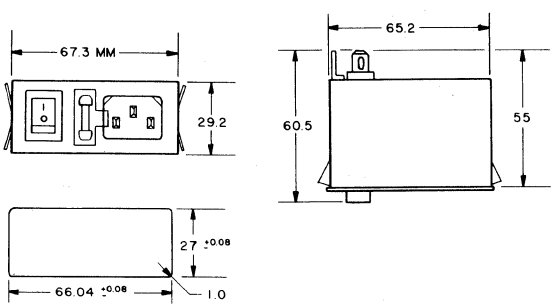
#83510170: Power module for use at 65°C with: 1) IEC 320 connector; 2) integral fuseholder for 5 x 20 mm fuse; 3) and 2-position voltage selector for No. Amer. 120VAC & Cont. European 220VAC. Snap-in mounting for panel thickness of 1.0-2.0mm or 0.04-0.08"; connections are made via soldering tabs.
Approvals: VDE, UL recog., CSA cert. at 6A/250VAC





IEC 320 connector, rocker switch, 5 x 20 mm fuse carrier & 6A RFI filter

#83510030: Power module for use at 65°C with: 1) IEC 320 connector; 2) integral fuseholder for 5 x 20 mm fuse; 3) integral double-pole off/on rocker switch; 4) integral 6A RFI filter (4A when used at 250VAC). Snap-in mounting for panel thickness of 1.0-2.0mm or 0.04-0.08"; connections made via soldering tabs. Max. leakage: 0.45mA at 250VAC/50Hz.
Approvals: UL and CSA—6A/125VAC (4A/250VAC); VDE—4A/250VAC



Dimensions are in mm.

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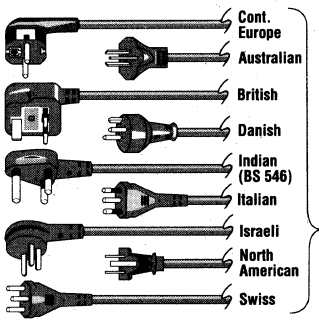
INTERNATIONAL power components • see also Sec. 4050 (Int'l. Power Source) • 4300 (Fuses) • 6000 (Int'l. Cords)

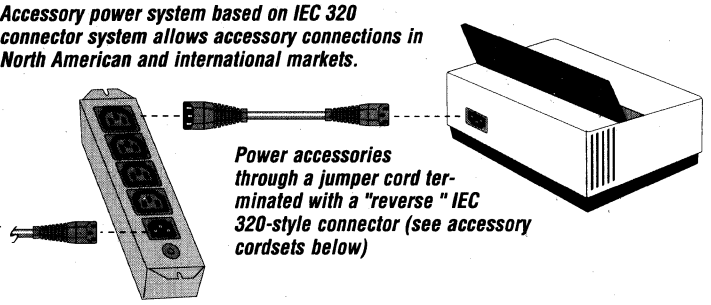
International Accessory Power Connections

65°C

Supply input power to the Accessory Socket Strip through a cordset terminated with an IEC 320 connector:

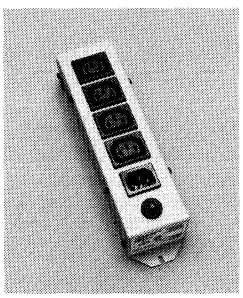


Accessory power system based on IEC 320 connector system allows accessory connections in North American and international markets.

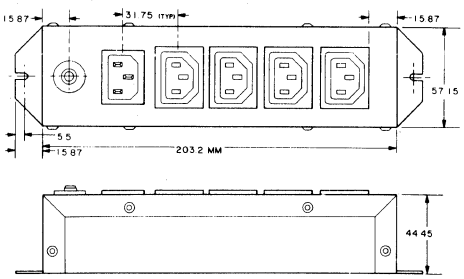


Power accessories through a jumper cord terminated with a "reverse " IEC 320-style connector (see accessory cordsets below)

Accessory Socket Strip



#85010040: With sockets based on the IEC 320 power connector, the Accessory Socket Strip allows you to power computer accessories anywhere in the world. Input power is supplied through a cordset terminated with an IEC 320 connector (e.g., any of the cordsets illustrated above). Accessories are powered through cordset models 86548001 for international markets or model 86548030 for North American markets. Gray metal casing; 6 amp circuit breaker.
Approvals: UL recognized, CSA certified, VDE Gutachten (6A/250VAC)



Accessory Cordsets

FOR INTERNATIONAL MARKETS

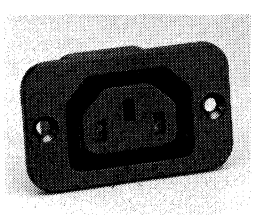
#86548001*: Utilizes Harmonized cordage* • Connector ends—IEC 320/ "Reverse" IEC 320 • Black • 1 meter (±0.1m) • Conductor size: 3x1.00mm² • Rated at 10A/250 VAC
Approvals: "Reverse" IEC 320 connector: VDE "Gutachten". IEC 320 connector: approved by all major European testing agencies. Harmonized cordage tested and certified by OVE to HAR (HD-21) specifications. Marking on outside of cable: < OVE > < HAR > MADE IN AUSTRIA + S + S + S. Color-coding of conductors: Brown=line • Blue=neutral • Green-yellow=ground.

FOR NO. AMERICAN MARKETS

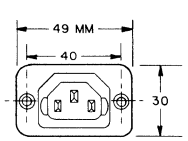
#86548030*: Utilizes AWG/SJT cordage* • Connector ends—IEC 320/ "Reverse" IEC 320 • Black • 1 meter (±0.1m) • Conductor size: 3x18AWG • Rated at 10A/250 VAC
Approvals: UL listed, CSA certified. SJT Cordage: PVC rated for use at 60° maximum; complies with UL 817 and CSA C22.2. Color-coding of conductors: Black=line • white=neutral • green=ground.

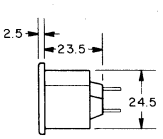
****Differences between North American and international cordage standards preclude manufacture of one jumper cord with UL, CSA and VDE.***

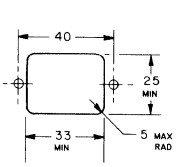
Accessory Power Connectors



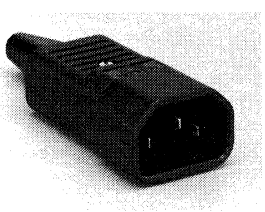
#83011220: Accessory power cord receptacle features shuttered contacts for safety. Contacts are 6.3mm (1/4") solder/ Q.D. tabs. Insulators molded from polyamide-type thermoplastic. Nickel-plated brass contacts.
Approvals: VDE (Gutachten), CSA cert., UL recog. (10A/250VAC)



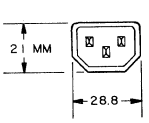


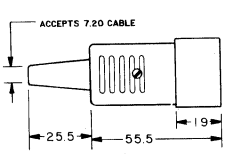


For custom accessory power cable assemblies. (We offer in-house made-to-order cord assembly services; contact us for a quotation.)



#83011080: Accessory power cord plug for straight cable entry. Insulators molded from polyamide-type thermoplastic. Nickel-plated brass contacts.
Approvals: BEAB, VDE, UL recog., CSA cert. (10A/250VAC)





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International Sockets and Plugs

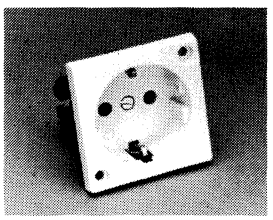
These international sockets and socket strips are useful in test and turn-in racks for equipment that is being exported. (Note our International Socket Strip in this section and our powered version, the International Power Source, in EEM Section 4050.) Mating plugs are available for each of the sockets listed. International cords and cordsets are available—see EEM Section 6000.

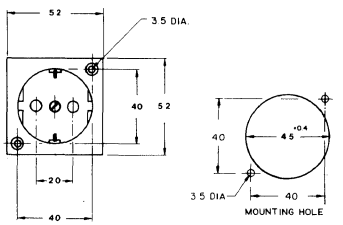
Plugs and Sockets shown below are also available in a convenient kit:

Designer's Kit of International Sockets (#88090030)—nine international sockets (all sockets shown here except French)

Designer's Kit of International Plugs (P/N 88090020)—nine plugs that mate with sockets in International Socket Kit

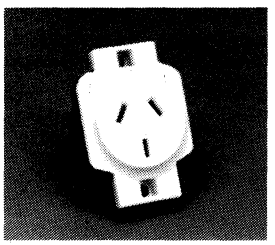
CONTINENTAL EUROPEAN

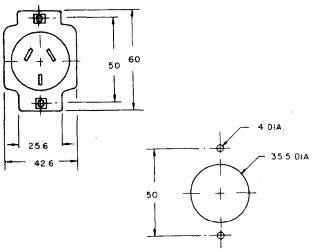




#88010610: Cont. European "Schuko" socket (West Germany, Austria, Belgium, Finland, the Netherlands, Norway, Sweden) with square face plate (ivory). (Mating plug, not shown: Part #88010801)
Approvals: VDE, KEMA, 16A/250VAC.

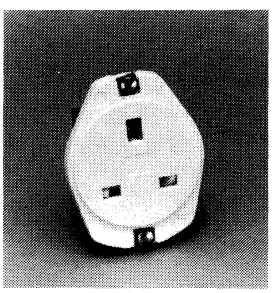
AUSTRALIAN

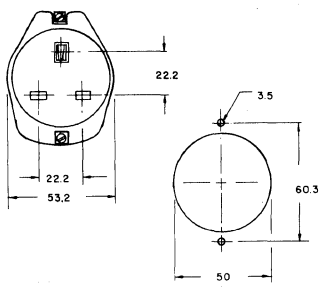




#88010512: Panel-mount Australian socket (white). (Mating plug, not shown: Part #88010710)
Approval: EANSW, 10A/250VAC.

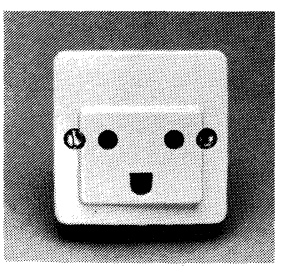
BRITISH

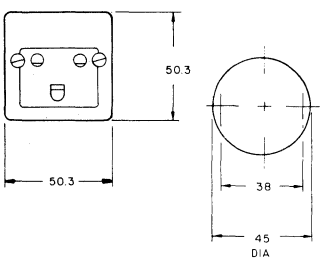




#88010621: British BS 1363 panel-mounting socket (white). Line and neutral contacts shuttered. (Mating plug, not shown, Part #88010721)
Approvals: Complies with BS 1363, 13A/250VAC.

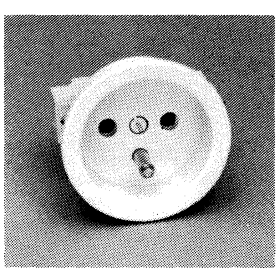
DANISH

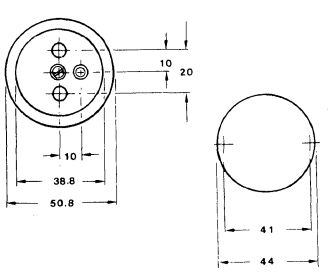




#88010540: Danish Afsnit 107-2-D1 socket (gray). Mounting bracket, available separately, secures socket to panel. Note: Continental European CEE 7-style plug fits into the Danish socket, but **the plug will not be grounded,** presenting an extreme safety hazard. (Mating plug, not shown, #88010740)
Approval: DEMKO, 10A/250VAC.

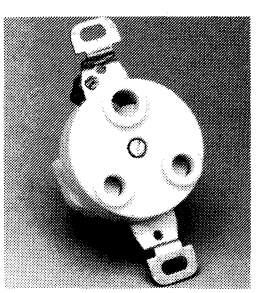
FRENCH

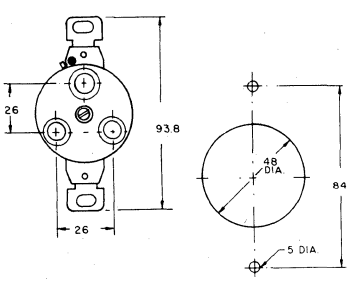




#88010550: French socket (ivory); similar to Continental European socket above but with male grounding pin. Current rating: 10A/250VAC.

INDIAN (old British Standard BS-546)





#88010560: British standard BS 546 socket used in India, Hong Kong, etc. (ivory). Line and neutral contacts are shuttered. Current rating: 15A/250VAC. (Mating plug, not shown, Part #88010762)

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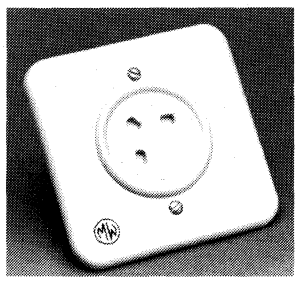
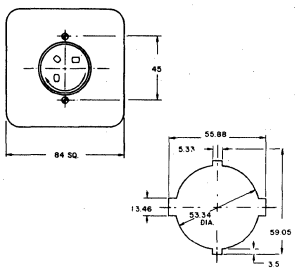
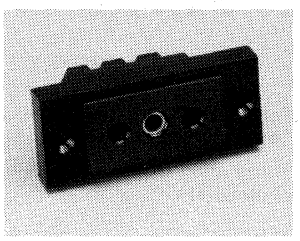
ISRAELI

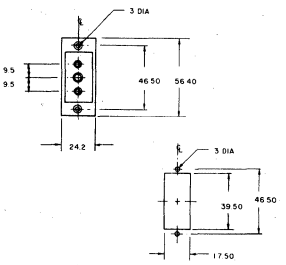




#88010580: Israeli SI 32 socket (white). Safety shuttering system reduces the possibility of accidental shock. (Mating plug, not shown: 88010780)
Approval: SII, 16A/250VAC.

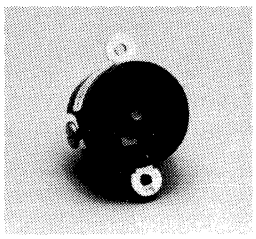
ITALIAN

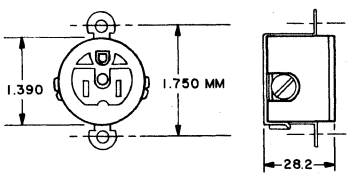




#88010570: Italian 10 amp socket (brown). (Mating plug, #88010771)
Approval: IMQ, 10A/250VAC.

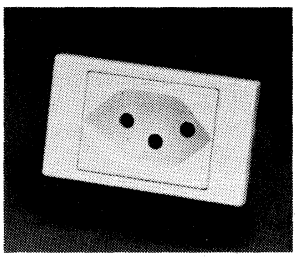
NORTH AMERICAN

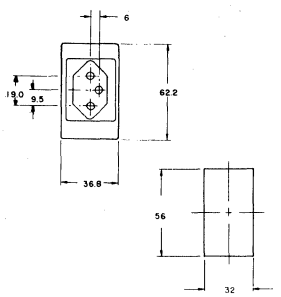




#5258: NEMA 5-15R receptacle (brown). Screw-type wire connections.
Approvals: UL recognized; CSA certified, 15A/125V AC/DC.

SWISS



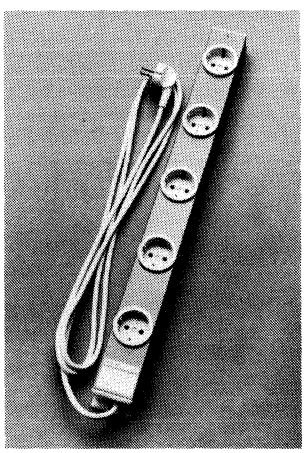


#88010530: Swiss SEV 1011 socket (ivory). (Mating plug, #88010732)
Approval: SEV, 10A/250VAC.

INTERNATIONAL power components • see also Sec. 4050 (Int'l. Power Source) • 4300 (Fuses) • 6000 (Int'l. Cords)

Socket Strips for International Markets

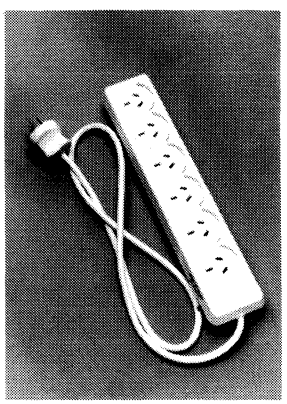
CONT. EUROPEAN



#85023050: Continental European socket strip (West Germany, Austria, Belgium, Finland, the Netherlands, Norway, Sweden) with five CEE 7 sockets. Cable is 2.5M long, terminated with CEE 7/4 plug. Sockets approved by VDE. Current rating: 16A/250VAC. Color: Orange.

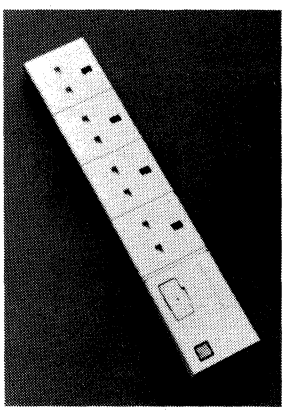
Many other models available.

AUSTRALIAN



#85010050: Australian socket strip with six sockets and circuit breaker. Cable is 1.75 meters long, terminated with an Australian plug. Current rating: 10A/250VAC. Color: – White
Approval: EANSW.

BRITISH



#85010321: British socket strip with four sockets. Circuit protection provided by a BS 1362, 13A fuse. Line and neutral shuttered on each socket. Note: Cord is not provided. Current rating: 13A/250VAC. Color: White

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Interpower™ International Socket Strips

The International Socket Strip incorporates seven of the main overseas socket standards in one device. Connect it to your own power source in burn-in racks or test labs where products with international cords or cordsets are being prepared for export; or, use it for receiving inspection on international cords and cordsets.

Installation to Your Power Source: The International Socket Strip is equipped with two unterminated power cords—one for connection to your 220VAC/ 50Hz power source, the other to a 240VAC/ 50Hz power source. The conductor size is 1.5mm² (slightly larger than 16 AWG which is 1.23mm²). Each circuit is rated at 16 amps maximum for all of the sockets combined. Each cord is 2.5 meters long and clearly marked as to voltage. The jacket and primary insulation are stripped and ready for installation to the appropriate power source. The primary insulation is color-coded in accordance with international standards: green/yellow=ground • brown=line • blue=neutral. Both table-mount and rack-mount models are usually available from stock in Santa Rosa, California.

See section 4050 for our International Power Source which converts standard North American input voltage of 120V/60Hz to output voltages of 0-250VAC at 47-63Hz or 47-500Hz.

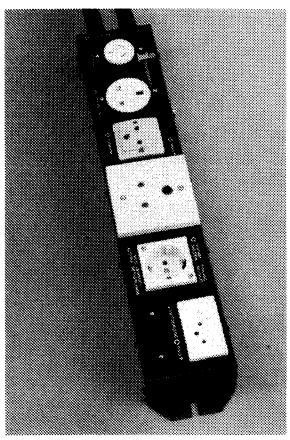
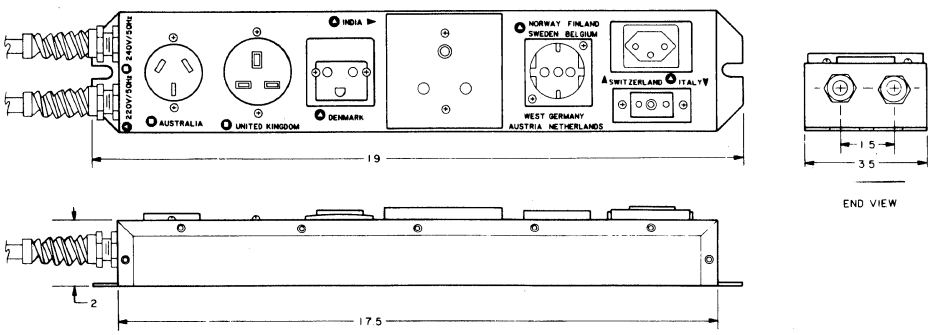
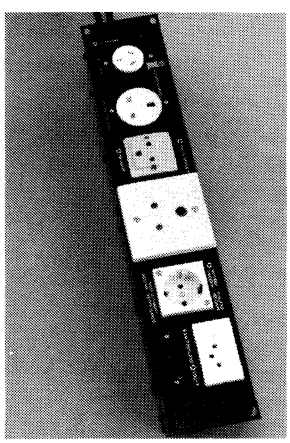
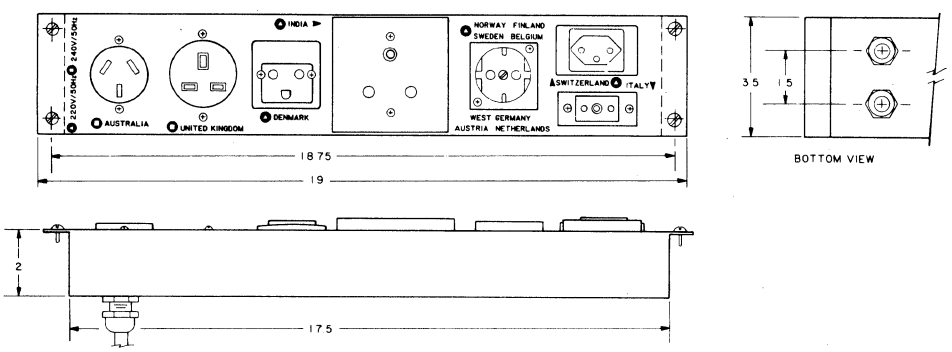


TABLE MOUNT MODEL
P/N 85010101





RACK MOUNT MODEL
P/N 85010111



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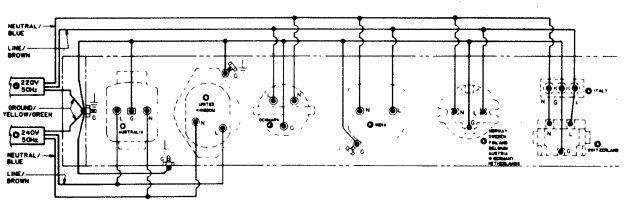
220VAC/50Hz circuit:		240VAC/50Hz circuit:	
Cont. Eur. (CEE 7/7)*	16A	Australia/New Zealand	10A
Danish	10A	United Kingdom	13A
Italian	10A		
Indian (BS 546)	16A		
Swiss	10A		

* CEE 7/7 is used in Austria, Finland, Netherlands, Norway, Sweden, West Germany; variation is used in France and Belgium.

INTERNAL WIRING: Each circuit is rated at 16 amps maximum for all of the sockets combined.



Dimensions are in inches

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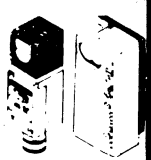
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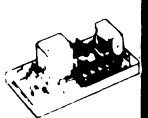
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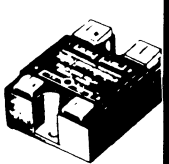
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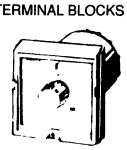
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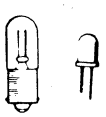
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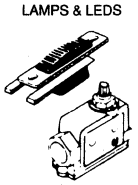
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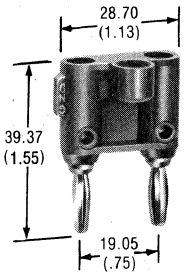
POMONA

STANDARD BANANA PLUGS/JACKS

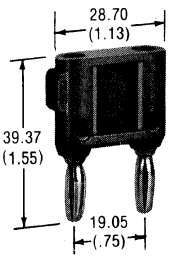
STANDARD DOUBLE BANANA PLUG



Setscrews secure leads. Simplifies cable construction or component mounting.
UPPER: Double banana jack. 4.22 mm (.166) dia., brass.
LOWER: Double banana plug. Spring, one piece heat treated beryllium copper. Fits standard 4.22 mm (.166) dia. banana jack.
RATING: 5000 WVDC, 15 Amps, +50°C. (+122°F.) Max. (Model 4898, +150°C. (+302°F.) Max.)

MODEL	FINISH	INSULATION	*STD COLORS:
MDP-*	Nickel plated	ABS	-0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet -8 Gray, -9 White
4892-*	Gold plated	ABS	-0 Black, -2 Red
4898-*	Nickel plated	Polyphenylene Sulfide	-0 Black, -6 Blue

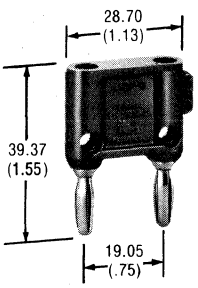
COMPONENT MOUNTING DOUBLE BANANA PLUG



Setscrews secure leads. Features recess for mounting small components.
UPPER: Double banana jack. 4.22 mm (.166) dia., brass, nickel plated.
INSULATION: ABS.
LOWER: Double banana plug. Spring, one piece heat treated beryllium copper, nickel plated. Fits standard 4.22 mm (.166) dia. banana jack.
RATING: 5000 WVDC, 15 Amps, +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black. -2 Red.

MODEL
1330-*

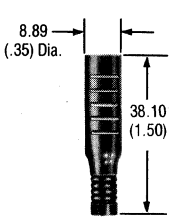
DOUBLE BANANA PLUG WITH SHORTING BAR



Banana plugs internally shorted with #18 AWG wire. Banana jacks provide top stackup. Cross holes 4.22 mm (.166) dia. in body provide side stackup connections.
UPPER: Double banana jack. 4.22 mm (.166) dia., brass, nickel plated.
INSULATION: ABS.
LOWER: Double banana plug. Spring, one piece heat treated beryllium copper. Nickel plated. Fits standard 4.22 mm (.166) dia. banana jack.
RATING: 5000 WVDC, 15 Amps, +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red, -9 White.

MODEL
MDP-S-*

DO-IT-YOURSELF IN-LINE BANANA JACK WITH FLEXIBLE BOOT



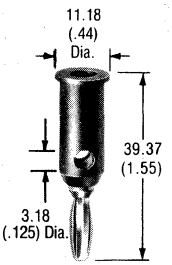
This in-line banana jack is ideal for making patch cords and field repairs. A snap-on two piece design allows the wire to be crimped or soldered to the banana jack.
MATERIAL: Brass.
FINISH: Nickel plated.
INSULATION: Flexible PVC.
RATING (Independent of Wire): 5000 WVDC, 15 Amps, +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

**Max. wire dia. 3.94 mm (.155)

MODEL	Accepts wire AWG**
5167-* 5168-*	22, 20, 18 16, 14

(unassembled)

SOLDERLESS STACKUP BANANA PLUG

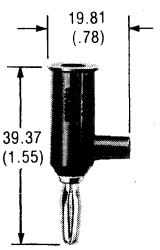


Wire firmly held in place with internal setscrew, eliminating soldering. Assembly of test leads simplified.
UPPER: Banana jack. 4.22 mm (.166) dia., brass.
LOWER: Banana plug. Spring, one piece heat treated beryllium copper. Fits standard 4.22 mm (.166) dia. banana jack.
RATING: 5000 WVDC, 15 Amps, +50°C (+122°F.) Max. (Model 5230, +150°C. (+302°F.) Max.)

(**Pkg. Ten Per Color)

MODEL	FINISH	INSULATION	*STD COLORS:
1325-*	Nickel plated	ABS	-0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet -8 Gray, -9 White
5406-*	Gold plated	ABS	-0 Black, -2 Red
5230-*	Nickel plated	Polyphenylene Sulfide	-0 Black, -6 Blue

SOLDERLESS STACKUP STANDARD BANANA PLUG WITH SAFETY COLLAR

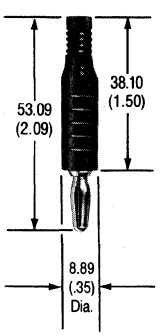


Features integral safety collar that insulates exposed wire leads. Wire firmly held in place with internal setscrew, eliminates soldering, simplifies assembly of test leads.
UPPER: Banana jack. 4.22 mm (.166) dia., brass.
LOWER: Banana plug. Spring, one piece heat treated beryllium copper. Fits standard 4.22 mm (.166) dia. banana jack.
RATING: 5000 WVDC, 15 Amps, +50°C. (+122°F.) Max. (Model 4899, +220°C. (+428°F.) Max.)

**(Pkg. Ten Per Color)

MODEL	FINISH	INSULATION	*STD COLORS:
1825-*	Nickel plated	ABS	-0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet -8 Gray, -9 White
4897-*	Gold plated	ABS	-0 Black, -2 Red
4899-*	Nickel plated	Polyphenylene Sulfide	-0 Black, -6 Blue

DO-IT-YOURSELF IN-LINE BANANA PLUG WITH FLEXIBLE BOOT



This in-line banana plug is ideal for making patch cords and field repairs. A snap-on two piece design allows the wire to be crimped or soldered to the banana plug.
MATERIAL: Banana plug body, brass. Spring, one piece heat treated beryllium copper. Fits standard 4.22 mm (.166) dia. banana jack.
FINISH: Nickel plated.
INSULATION: Flexible PVC.
RATING (Independent of Wire): 5000 WVDC, 15 Amps, +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

**Max. wire dia. 3.94 (.155)

MODEL	Accepts wire AWG**
5169-* 5170-*	22, 20, 18 16, 14

(unassembled)

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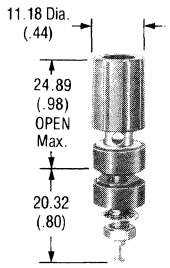
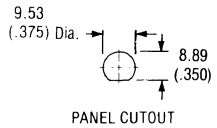
BANANA PLUG/JACK ADAPTERS

STANDARD BINDING POST

Accepts standard banana plug. Thin line design for high-density packaging. Nickel plated 8-32 hex nut and lockwasher included. 2.54 mm (.100) dia. cross hole is perpendicular with flat on insulator. Mounts in panels 1.57 mm (.062) to 6.35 mm (.250) thick.
RATING: 2500 WVDC, 15 Amps, +115°C. (+239°F.) Max. (Model 4901, +220°C. (+428°F.) Max.)



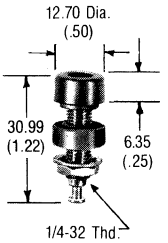


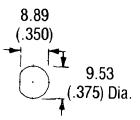
PANEL CUTOUT

MODEL	MATERIAL	INSULATION	*STD COLORS
3750-*	Brass, gold plated	Polycarbonate	-0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow -5 Green, -6 Blue, -7 Violet -8 Gray, -9 White
3760-*	Brass, bright tin plated		
3770-*	Tellurium copper, gold plated		
4901-*	Brass, bright tin plated	Polyphenylene Sulfide	-0 Black, -6 Blue

BANANA JACK

Closed entry jack 4.22 mm (.166) dia. x 23.37 mm (.920) deep. Mounts in panels from 1.60 mm (.063) to 9.53 mm (.375) thick. Nickel plated lockwasher and ¼-32 hex nut.
MATERIAL: Brass.
RATING: 2500 WVDC, 15 Amps, +115°C. (+239°F.) Max. (Model 4900, +220°C. (+428°F.) Max.)





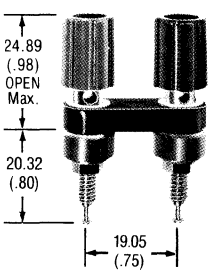
PANEL CUTOUT

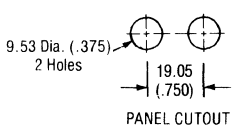
(**Pkg. Ten Per Color)

MODEL	MATERIAL	INSULATION	*STD COLORS
1581-*	Brass, bright tin plated	Polycarbonate	-0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White
2854-*	Brass, gold plated		
4900-*	Brass, bright tin plated	Polyphenylene Sulfide	-0 Black, -6 Blue
5294-*	Tellurium copper, gold plated	Polycarbonate	-0 Black, -2 Red

DOUBLE BINDING POST ASSEMBLY

Nickel plated 8-32 hex nut and lockwasher included. One red and one black tin plated binding post (type 3760) with double mounting base.
MATERIAL: Double binding post with captive thumb nut, brass. Accepts standard banana plug.
FINISH: Bright tin plated.
INSULATION: Polycarbonate.
RATING: 2500 WVDC, 15 Amps, +115°C. (+239°F.) Max.
***MTG BASE COLOR:** -0 Black, -2 Red.





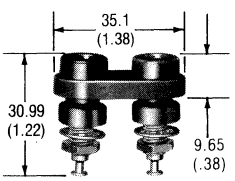
PANEL CUTOUT

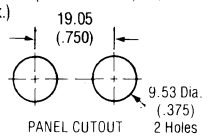
MODEL
4243-*

(unassembled)

DOUBLE BANANA JACK

Closed entry receptable 4.22 mm (.166) dia. × 23.37 (.920) deep on 19.05 mm (.750) centers. Mounts in panels from 1.60 mm (.063) to 9.53 mm (.375) thick. Nickel plated lockwasher and ¼" 32 hex nut. Model 2269 has one black and one red jack. Model 5233 has one black and one blue jack. Specify mounting base color.
MATERIAL: Brass.
FINISH: Bright tin plated.
RATING: 2500 WVDC, 15 amps, +115°C. (+239°F.) Max. (Model 5233, +220°C. (+428°F.) Max.)





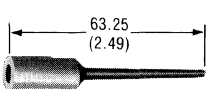
PANEL CUTOUT

MODEL	INSULATION	*STD COLORS:
2269-*	Polycarbonate	-0 Black, -2 Red
5233-*	Polyphenylene sulfide	-0 Black

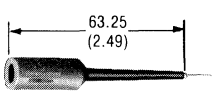
CONNECTOR TEST ADAPTERS

An ideal test adapter for rapid testing of the hard-to-get at contacts of multipin/socket rack or panel connectors. Flexible tip allows testing of adjacent contacts. Flexibility and full insulation protects against shorting or contact damage. The model 4690 also fits .635 mm (.025) sq. pins.
UPPER: Banana jack. 4.22 mm (.166) dia., brass, nickel plated.
INSULATION: Polyvinyl chloride (PVC).
LOWER: Socket type, copper. Pin type, brass. Gold plated. See tab block.
RATING: 2500 WVDC, +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

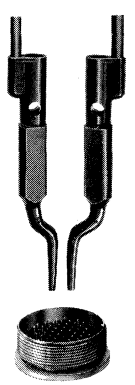
MODEL	Contact Size		Type	Current Rating
4690-*	22		Socket	5 Amps
4691-*	22	.762 (.030) dia.	Pin	5 Amps
3560-*	20		Socket	7.5 Amps
3561-*	20	1.02 (.040) dia.	Pin	7.5 Amps
3562-*	16		Socket	13 Amps
3563-*	16	1.60 (.063) dia.	Pin	13 Amps
3564-*	12		Socket	23 Amps
3565-*	12	2.36 (.093) dia.	Pin	23 Amps



3562
SOCKET TYPE



3561
PIN TYPE



TYPICAL APPLICATION

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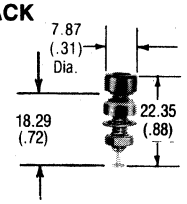
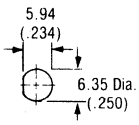
POMONA

MISCELLANEOUS ADAPTERS

MINIATURE INSULATED BANANA JACK

Closed entry 2.64 mm (.104) dia. jack. Mounts in panels up to 6.35 mm (.250) thick. Nickel plated 8-32 hex nut and lockwasher included.
MATERIAL: Brass.
FINISH: Gold plated.
INSULATION: Polycarbonate.
RATING: 1500 WVDC, 5 Amps, +115°C. (+239°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.





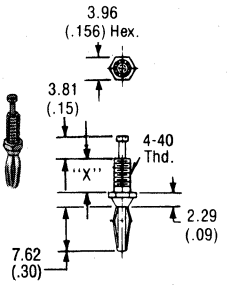
PANEL CUTOUT

MODEL
2142-*

(unassembled) (Pkg. Ten Per Color)

MINIATURE BANANA PLUG WITH THREADED STUD

Threaded stud for rapid mounting. Solder turret for attachment of wires. Furnished with nickel plated 4-40 hex nut, unassembled.
MATERIAL: Miniature banana plug body, brass. Spring, one piece heat treated beryllium copper. Fits miniature 2.64 mm (.104) dia. banana jack.
FINISH: Gold plated.
RATING: 2500 WVDC, 5 Amps.

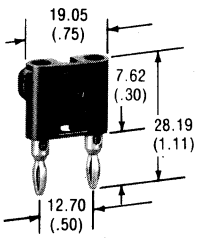


MODEL	"X" Dim.
3276	5.84 (.230)
4513	12.19 (.480)

(Ten Per Pkg., unassembled)

MINIATURE DOUBLE BANANA PLUG WITH SETSCREWS

Internal setscrews to secure cable or component leads.
UPPER: Miniature double banana jack. Brass, gold plated.
INSULATION: ABS.
LOWER: Miniature double banana plug. Spring, one piece heat treated beryllium copper, gold plated. Fits miniature 2.64 mm (.104) dia. banana jack. Setscrew, steel, cadmium plated.
RATING: 2500 WVDC, 5 Amps, +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

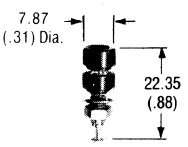


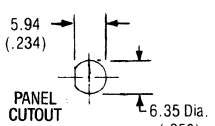
MODEL
2244-*

(Recommend using Screwdriver No. 3736)

PIN JACK

Closed entry 2.03 mm (.080) pin jack. Mounts in panels to 6.35 mm (.250) thick. Nickel plated 8-32 hex nut and lockwasher included.
MATERIAL: Pin jack body, brass. Spring, beryllium copper.
FINISH: Pin jack, gold plated.
INSULATION: Polycarbonate.
RATING: 1500 WVDC, 5 Amps, +115°C. (+239°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.



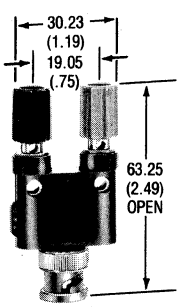


MODEL
3542-*

(Pkg. Ten Per Color, unassembled)

STANDARD DOUBLE BINDING POSTS TO BNC MALE

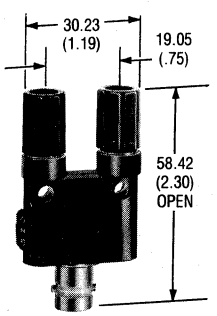
Permits single or double banana plugs to be used with equipment having a BNC female.
UPPER: Double binding post with captive thumb nut. Brass, nickel plated. Accepts standard banana plugs. Polycarbonate insulation. One black and one red.
INSULATION: ABS, black.
LOWER: BNC male. Impedance: 50 Ohms.
RATING: Operating Voltage: 500 VRMS Max., +50°C. (+122°F.) Max.



MODEL
1296

BINDING POSTS TO BNC FEMALE

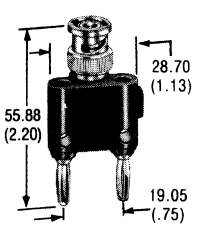
Permits single or double banana plugs to be used with equipment having a BNC male.
UPPER: Double binding post with captive thumb nut. Brass, nickel plated. Accepts standard banana plugs. Polycarbonate insulation. One black and one red.
INSULATION: ABS, black.
LOWER: BNC female. Impedance: 50 Ohms.
RATING: Operating Voltage: 500 VRMS Max., +50°C. (+122°F.) Max.



MODEL
1452

BNC MALE TO DOUBLE BANANA PLUG

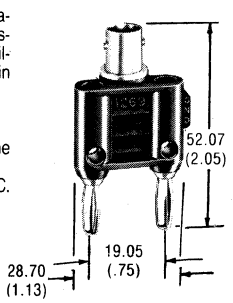
Permits BNC female to be used with equipment having banana jacks. Cross holes 4.22 mm (.166) dia. in body provide side stackup connections.
UPPER: BNC male. Impedance: 50 Ohms.
INSULATION: ABS, black.
LOWER: Double banana plug. Body, brass. Spring, one piece heat treated beryllium copper. Nickel plated.
RATING: Operating Voltage: 500 VRMS Max., +50°C. (+122°F.) Max.



MODEL
1270

BNC FEMALE TO DOUBLE BANANA PLUG

Permits BNC male to be used with equipment having banana jacks. Excellent for adapting laboratory VTVM, oscilloscopes and signal generator inputs to readily available coaxial cables. Cross holes 4.22 mm (.166) dia. in body provide side stackup connections.
UPPER: BNC female. Impedance: 50 Ohms.
INSULATION: ABS, black.
LOWER: Double banana plug. Body, brass. Spring, one piece heat treated beryllium copper. Nickel plated.
RATING: Operating Voltage: 500 VRMS Max., +50°C. (+122°F.) Max.



MODEL
1269

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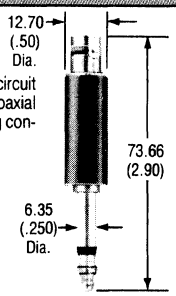
COAXIAL ACCESSORIES

BNC FEMALE TO PJ-051/WE-310 PHONE PLUG

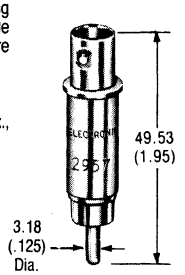
Permits BNC male to be used with equipment having three circuit phone jacks. Readily adapts equipment to available BNC coaxial cables. Tip connected to inner contact of connector and ring connected to shell. Sleeve, no connection.
UPPER: BNC female. Impedance: 50 Ohms.
INSULATION: ABS, black.
LOWER: Phone plug, PJ-051 (equivalent to WE-310).
RATING: 500 V peak, +50°C. (+122°F.) Max.



MODEL
2798

BNC FEMALE TO PHONO PLUG

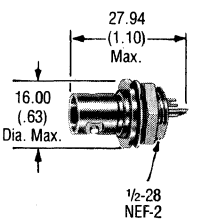
Permits BNC male to be used with equipment having phono jacks. Readily adapts equipment to available BNC coaxial cables. All metal construction to insure proper shielding.
UPPER: BNC female. Impedance: 50 Ohms.
LOWER: Phono plug, brass, nickel plated.
RATING: Operating Voltage: 500 VRMS Max., +102°C. (+216°F.) Max.

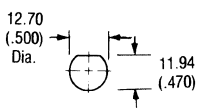


MODEL
2957

ISOLATED GROUND BNC FEMALE BULKHEAD RECEPTACLES

These connectors have the outer conductor isolated from the panel. Excellent for use with equipment requiring a floating ground. Mounts in panels up to 4.57 mm (.18) thick.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Beryllium copper, gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max., -65°C. (-85°F.) to +165°C. (+329°F.)
IMPEDANCE: 50 Ohms (Except as noted.)





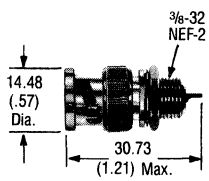
PANEL CUTOUT

a) Standard BNC interface.

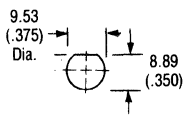
MODEL	Special Features
3778	
5348	75 Ohm a) Impedance

BNC MALE BULKHEAD RECEPTACLE

Mounts in panels up to 4.83 mm (.19) thick.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Brass. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max. -65°C. (-85°F.) to +165°C. (+329°F.)
IMPEDANCE: 50 Ohms



MODEL 4979
BNC (m)

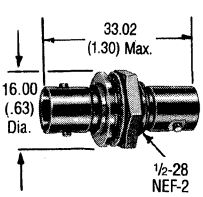


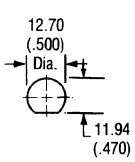
PANEL CUTOUT

MODEL
4979

ISOLATED GROUND BNC FEMALE TO FEMALE

Mounts in panels up to 4.31 mm (.17) thick.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max. -65°C. (-85°F.) to +165°C. (+329°F.)
IMPEDANCE: 50 Ohms





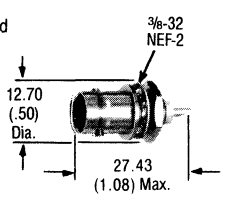
PANEL CUTOUT

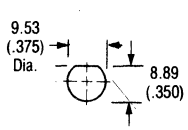
Mounting hardware is isolated from outer conductor of BNC.

MODEL
3846

BNC FEMALE BULKHEAD RECEPTACLE

Mounts in panels up to 3.30 mm (.13) thick.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Beryllium copper. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max. -65°C. (-85°F.) to +165°C. (+329°F.)
IMPEDANCE: 50 Ohms (Except as noted.)





PANEL CUTOUT

a) Standard BNC interface.

MODEL	Special Features
4160	
5081	75 Ohms (a)

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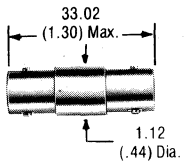
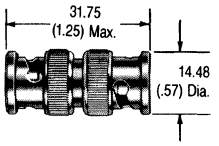
COAXIAL ADAPTERS

ADAPTERS

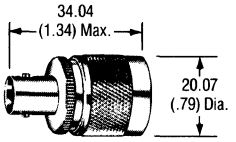
SHELL: Brass, tarnish resistant plating.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. (Except as noted.) Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max. (Except as noted.)–65°C. (–85°F.) to +165°C. (+329°F.)
IMPEDANCE: 50 Ohms.



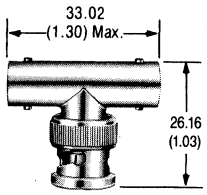
MODEL 3283
BNC (f/f)



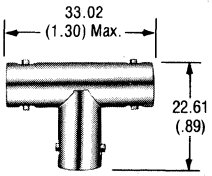
MODEL 3533
BNC (m/m)



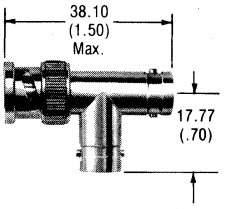
MODEL 3288
BNC (f)/"N" (m)



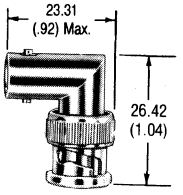
MODEL 3285
BNC (f/m/f)



MODEL 3284
BNC (f/f/f)



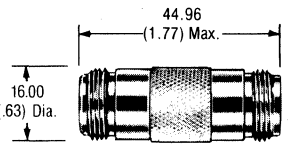
MODEL 4896
BNC (m/f/f)



MODEL 3534
BNC (f/m)

MODEL	Special Features
3283	
3284	
3285	
3288	Beryllium Copper Male Contact
3533	
3534	
3841	Operating Voltage 1000 VRMS Max.
4896	

Adapter assortment available in kits. (Models 5510 & 5511)



MODEL 3841
"N" (f/f)

COAXIAL CABLE PLUGS/JACKS

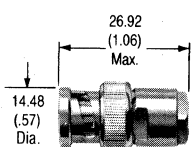
BNC CABLE PLUGS/JACKS

SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL- C-39012.
RATING: Operating Voltage: 500 VRMS Max.
IMPEDANCE: 50 Ohms. (Except as noted.)

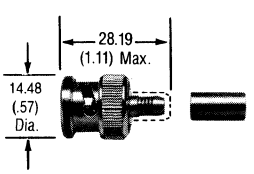
	CABLE GROUPS RG/U
1	8, 8A, 9, 9A, 9B, 11, 11A, 13A, 213, 214, 216
2	142, 142A, 142B, 223
3	58, 58A, 58C, 141, 141A
4	59, 59A, 59B, 62, 62A, 62B, 62C, 210
5	71, 71A, 71B
6	174, 179A, 179B, 187, 187A, 188, 188A, 316

a) Standard BNC interface

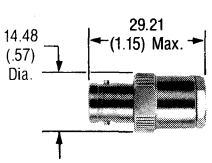
MODEL	Special Features	Cable Group
4488		2, 3
4786		4, 5
4978		2, 3
4997	Field Serviceable	RG58
4998		RG59
4999		RG174
5061		4, 5
5079	75 Ohm (a) Impedance	4, 5
5285		3
5286		4
5307		6
5344		3
5345		4



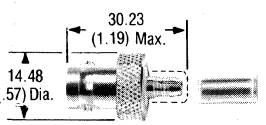
MODELS 4488, 4786, 4997, 4998, 4999, 5079, 5307



MODELS 5285, 5286



MODELS 4978, 5061



MODELS 5344, 5345

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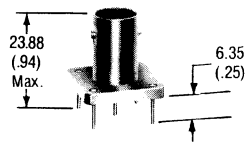
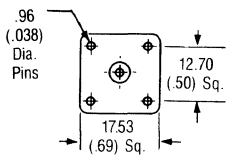
POMONA

COAXIAL PC MOUNTS

BNC FEMALE PC MOUNT

Permits BNC male to be used with 1/8" thick printed circuit boards.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Beryllium copper, gold plated per requirements of MIL-C-39012.
PC PINS: Brass, silver plated.
RATING: Operating Voltage: 500 VRMS Max., Impedance: 50 Ohms, -65°C. (-85°F.) to +165°C. (+329°F.)

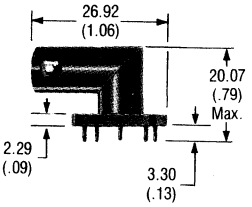


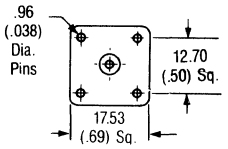


MODEL
4578

BNC RIGHT ANGLE FEMALE PC MOUNT

Permits the installation of a right angle BNC female directly to a 1/16" thick printed circuit board.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Beryllium copper, gold plated per requirements of MIL-C-39012.
PC PINS: Brass, silver plated.
RATING: Operating Voltage: 500 VRMS Max., Impedance: 50 Ohms, -65°C. (-85°F.) to +165°C. (+329°F.)





MODEL
4788

SMA ADAPTERS

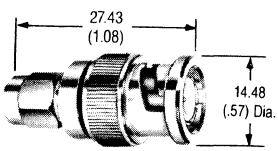
SHELL: SMA, beryllium copper.
All others, brass.
INSULATION: Teflon.
CENTER CONTACT: Male, brass.
Female, beryllium copper.
FINISH: Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 335 VRMS Max., Impedance: 50 Ohms.

These SMA adapters meet the requirements of MIL-A-55339. The 50 Ohm subminiature series R.F. connectors are especially adaptable to microwave component applications such as couplers, dividers and mixers.

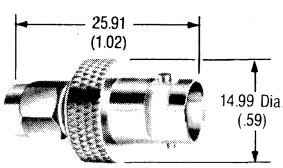
Thread SMA Male: 1/4-36 UNS-2B, SMA Female: 1/4-36 UNS-2A.

Frequency range: SMA to BNC: 0-4 GHz.
SMA to N: 0-11 GHz.
Within Series SMA: 0-12 GHz.

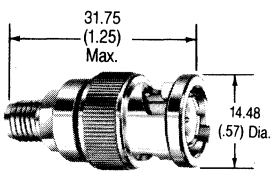
Temperature range: -65°C. (-85°F.) to +165°C. (+329°F.)



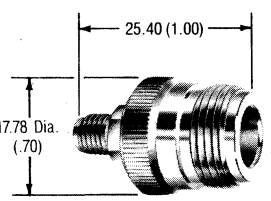
MODEL 4288
SMA(m)/BNC (m)



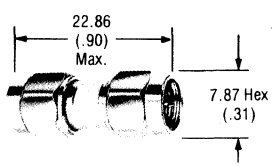
MODEL 4290
SMA (m)/BNC (f)



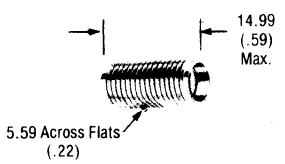
MODEL 4289
SMA (f)/BNC (m)



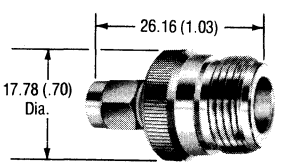
MODEL 4299
SMA (f)/"N" (f)



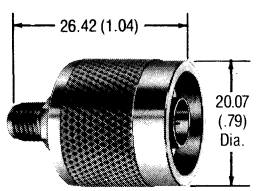
MODEL 4283
SMA (m/m)



MODEL 4284
SMA (f/f)

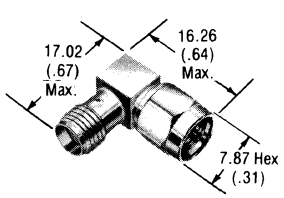


MODEL 4298
SMA (m)/"N" (f)

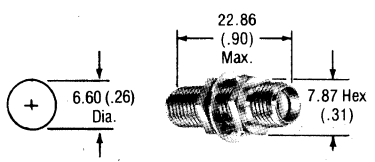


MODEL 4297
SMA (f)/"N" (m)

MODEL
4282
4283
4284
4285
4286
4288
4289
4290
4297
4298
4299

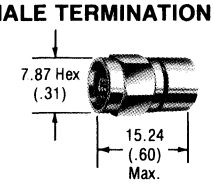


MODEL 4282
SMA (f/m)



MODEL 4285
SMA (f/f)

MALE TERMINATION



MODEL 4286
VSWR: 1.25 Max to 18 GHz; ½ Watt

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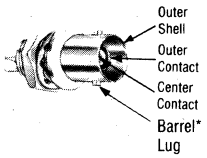
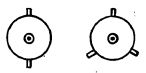
POMONA

TRIAXIAL CONNECTORS

SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL-C-49142.
RATING: Operating Voltage: 500 VRMS Max., Frequency range: DC to 500 MHz, -65°C. (-85°F.) to +165°C. (+329°F.)

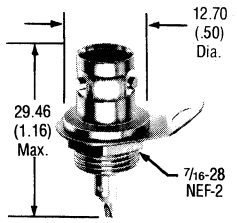




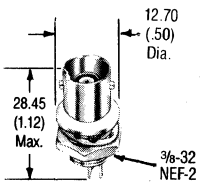
*Two lug model is shown. On units having three lugs, the spacing is 120°.

Triaxial connectors accommodate the need for low level signal patching and balanced line applications. Designed for use with double shielded single conductor or shielded twisted pair cable. These connectors feature a concentric design with center contact, outer contact and outer shell (see photo). This concentric design does not require matching of halves such as the polarized stepped insulator connectors.

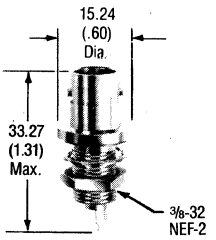
TRIAXIAL BULKHEAD RECEPTACLES, FEMALE



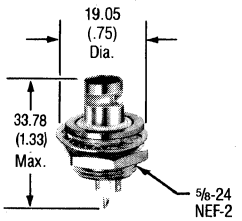
MODEL 5219
SEE FIG. 1



MODEL 3580
SEE FIG. 2



MODEL 4388
SEE FIG. 2



MODEL 5091
SEE FIG. 3

MODEL	Special Features	
3580	2 Lug	
4388		Hermetically Sealed a)
5091		Isolated Ground b)
5219	3 Lug	

a) Leakage less than 10^{-7} cc/sec tracer gas at one atmosphere.
b) Mounting hardware is isolated from outer conductor.

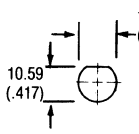


FIG. 1
Max. Panel Thickness 3.56 (.14)

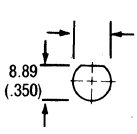


FIG. 2
Max. Panel Thickness 6.35 (.25)

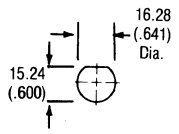
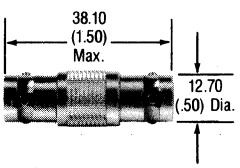


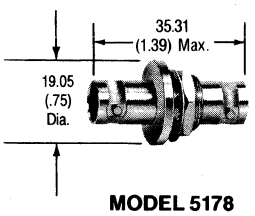
FIG. 3
Max. Panel Thickness 6.35 (.25)

TRIAXIAL ADAPTERS WITHIN SERIES, FEMALE

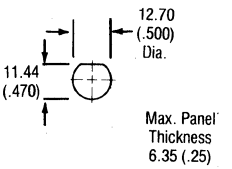
MODEL	Special Features
5178	2 Lug
5278	3 Lug
5290	2 Lug



MODELS 5278, 5290

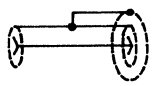


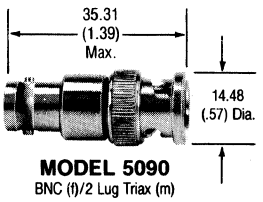
MODEL 5178



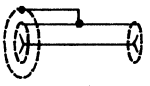
TRIAXIAL ADAPTERS BETWEEN SERIES

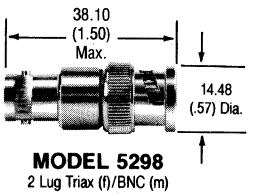
MODEL
5090
5298
5299
5300





MODEL 5090
BNC (f)/2 Lug Triax (m)

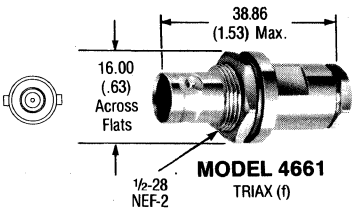




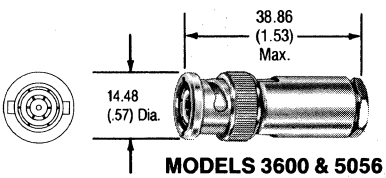
MODEL 5298
2 Lug Triax (f)/BNC (m)

CABLE PLUGS/JACKS

SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL-C-49142.
RATING: Operating Voltage: 500 VRMS Max., Frequency range: DC to 500 MHz, -65°C. (-85°F.) to +165°C. (+329°F.)
Cabling instructions furnished on request.

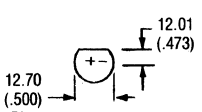


MODEL 4661
TRIAX (f)

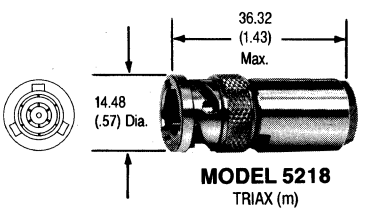


MODELS 3600 & 5056
TRIAX (m)

MODEL	Special Features		Fits Cable Types†
3600	2 Lug	78 Ohms	Belden 9272 6.15 (.242) O.D.
4661			Microdot 293-3930 4.45 (.175) O.D.
5056		50 Ohms	Belden 9222 6.15 (.242) O.D.
5218	3 Lug		



Max. Panel Thickness 3.05 (.12)
Panel Cutout for Model 4661



MODEL 5218
TRIAX (m)

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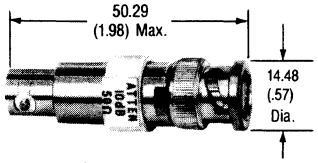
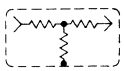
POMONA

COAXIAL ACCESSORIES/TERMINATIONS

BNC 50 OHM ATTENUATORS

For use with pulse, microwave, or UHF instruments.
50 Ohm, metal film resistor, deposited nichrome over ceramic core, 2 watt T-Pad network. White nylon anti-roll sleeve.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max.; +102°C. (+216°F.) Max.





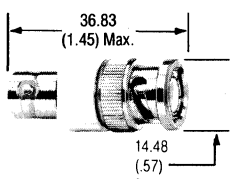
Attenuater assortment available in a kit. (Model 5513)

MODEL	Attenuation
4108-3dB	3dB
4108-6dB	6dB
4108-10dB	10dB
4108-14dB	14dB
4108-20dB	20dB

VSWR	Attenuation Tolerance
1.1 to 1GHz	±0.4 dB to 1GHz
1.2 to 2GHz	±0.45dB to 2GHz
1.35 to 4GHz	±0.65dB to 4GHz
1.45 to 6GHz	±0.75dB to 6GHz
1.65 to 8GHz	±0.9 dB to 8GHz

BNC FEED-THRU TERMINATION

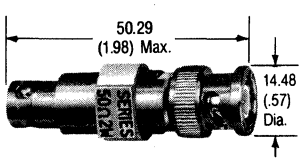
Ideal for terminating pulse, microwave or UHF instruments in their characteristic impedance. Termination carbon film resistor, deposited over ceramic core, 2W. Resistance value marked on white nylon anti-roll sleeve.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max.; Frequency Range: DC to 500 MHz; +102°C. (+216°F.) Max.



MODEL	Resist. in Ohms
4119-50	50
4119-75	75
4119-93	93
4119-600	600

BNC FEED-THRU SERIES RESISTOR

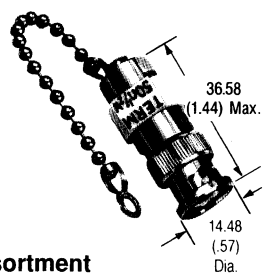
Ideal for adding in series resistance to coaxial lines with BNC connectors. 1%, 2 watt, non-inductive film resistor. Resistance value marked on white nylon anti-roll sleeve.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Male, brass. Female, beryllium copper. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max., Frequency Range: DC to 500 MHz; +102°C. (+216°F.) Max.



MODEL	Resist. in Ohms
4391-25	25
4391-50	50
4391-75	75
4391-93	93
4391-600	600

BNC RESISTOR TERMINATED MALE PLUG

Ideal for terminating coaxial lines. 1%, ½ watt, deposited carbon resistor. 88.9 mm (3.5) bead chain with 3.56 mm (.14) dia. hole in lug. Resistance value marked on white nylon anti-roll sleeve.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Brass, gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 350 VDC Max.; Frequency range: DC to 500 MHz; Power: 1/2W @ 70°C. Max.

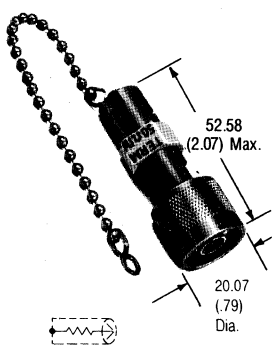


Termination assortment available in a kit. (Model 5512)

MODEL	Resist. in Ohms
3840-50	50
3840-75	75
3840-93	93
3840-100	100
3840-600	600

TYPE "N" RESISTOR TERMINATED MALE PLUG

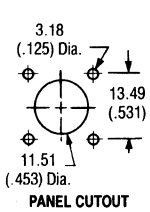
Ideal for terminating coaxial lines. 1%, 1 watt, deposited carbon resistor. 127 mm (5.0) bead chain with 3.56 mm (.14) dia. hole in lug. Resistance value marked on white nylon anti-roll sleeve.
SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Brass, gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VDC Max., Frequency range: DC to 500 MHz; Power: 1W @ 70°C. Max.



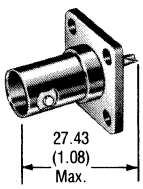
MODEL	Resist. in Ohms
4240-50	50
4240-75	75
4240-600	600

PANEL RECEPTACLE BNC FEMALE

SHELL: Brass, tarnish resistant plated.
INSULATION: Teflon.
CENTER CONTACT: Beryllium copper. Gold plated per requirements of MIL-C-39012.
RATING: Operating Voltage: 500 VRMS Max. –65°C. (–85°F.) to +165°C. (+329°F.)
IMPEDANCE: 50 Ohms.



PANEL CUTOUT



MODEL
2451

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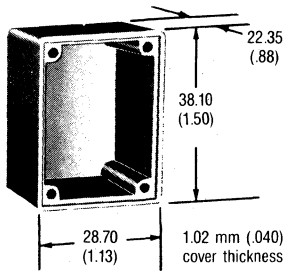
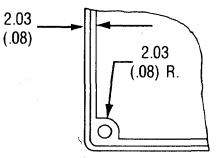
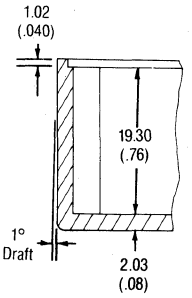
DIE CAST ALUMINUM BOXES

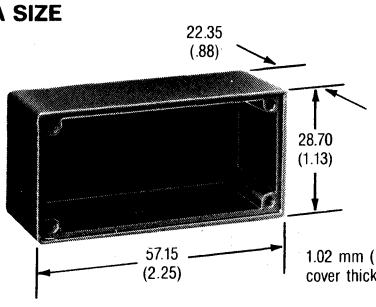
MINIATURE SIZE

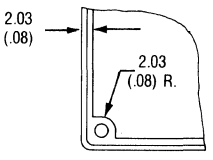


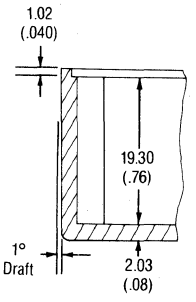




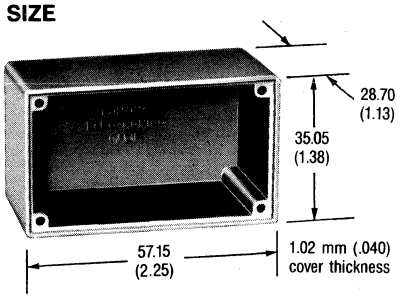
A SIZE

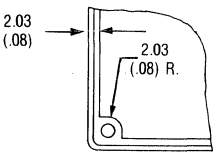


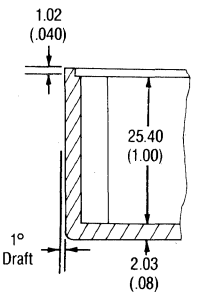




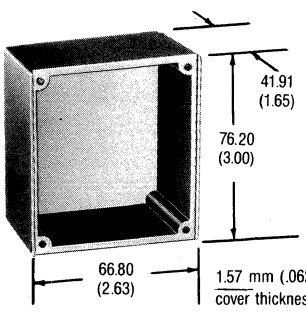
B SIZE

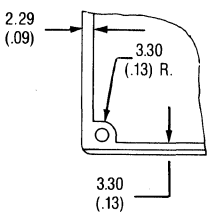


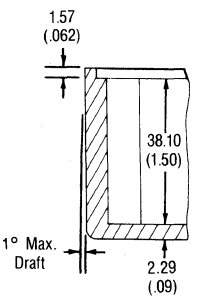




D SIZE







MODEL	Box Size	Finish
3753 3754	Miniature	Blue Baked Enamel None
2397 2400	A	Blue Baked Enamel None
2417 2428	B	Blue Baked Enamel None
3601 3606	D	Blue Baked Enamel None

These boxes are available either with a blue baked enamel finish or with no finish at all. When used with the included cover, the boxes provide excellent RFI/EMI protection.
HOUSING: Die cast aluminum, alloy A380 or A384. Blue baked enamel per Federal Standard 595 #25109 over primer wash per DOD-P-15328 or no finish.
COVER: Aluminum 1100-H14, with clear anodized finish per MIL-A-8625. Includes cover screws.

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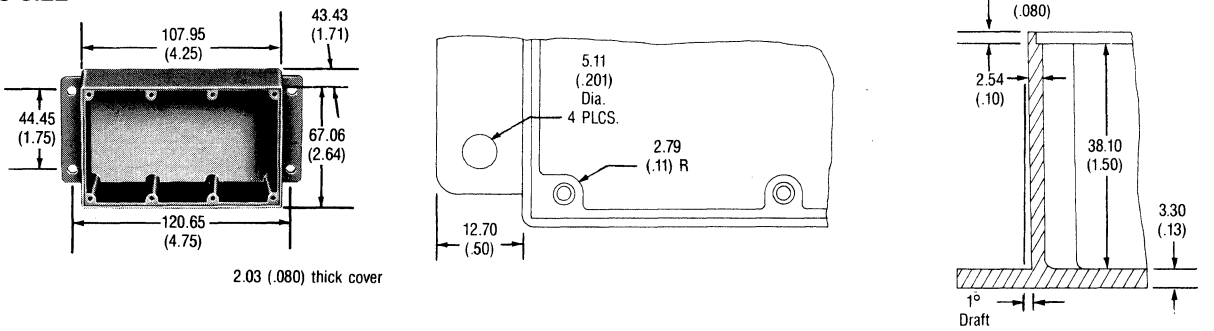
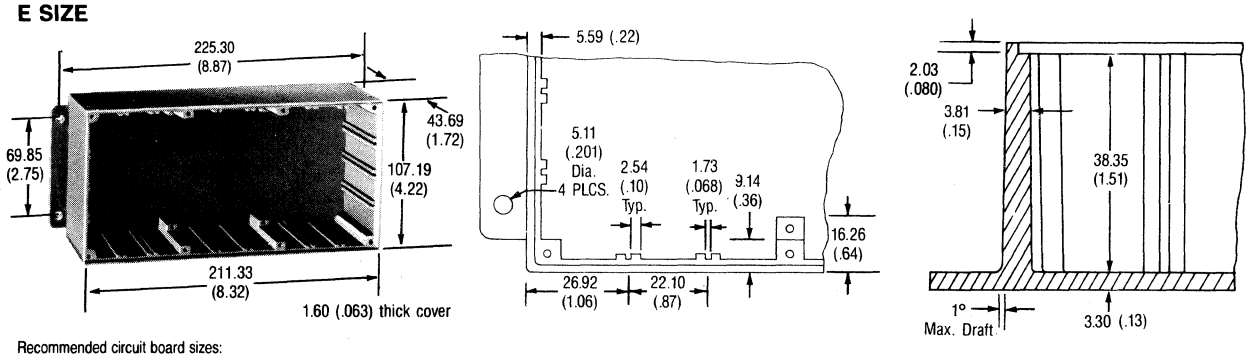
DIE CAST ALUMINUM BOXES

C SIZE



E SIZE



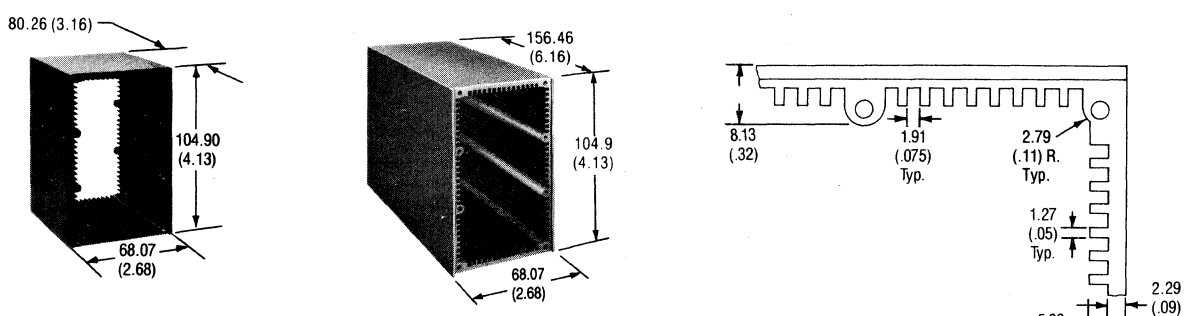
Recommended circuit board sizes:
Vertical: 203.20 (8.00) x 37.85 (1.49) x 1.57 (.062) thick
99.06 (3.90) x 37.85 (1.49) x 1.57 (.062) thick
Horizontal: 193.04 (7.60) x 96.52 (3.80) x 1.57 (.062) thick

MODEL	Box Size	Finish
2901	C	Blue Enamel
2906		None
4226	E	Blue Enamel
5186		None

These boxes are available either with a blue baked enamel finish or with no finish at all. When used with the included cover, the boxes provide excellent RFI/EMI protection.

HOUSING: Die cast aluminum, alloy A380 or A384. Blue baked enamel per Federal Standard 595 #25109 over primer wash per DOD-P-15328 or no finish. (See Table)
COVER: Aluminum 1100-H14, with clear anodized finish per MIL-A-8625. Includes cover screws.

EXTRUDED ALUMINUM BOXES



SIZE G

Recommended circuit board sizes:
99.06 (3.90) x 75.69 (2.98) x 1.57 (.062) thick
60.96 (2.40) x 75.69 (2.98) x 1.57 (.062) thick

SIZE H

Recommended circuit board sizes:
99.06 (3.90) x 151.89 (5.98) x 1.57 (.062) thick
60.96 (2.40) x 151.89 (5.98) x 1.57 (.062) thick

MODEL	Box Size	Finish
3311	G	Blue Enamel
3316	G	None
3742	H	Blue Enamel
3743	H	None

These boxes are slotted to accept 1.57mm (.062) circuit boards and shielding dividers. They are available with a blue baked enamel finish or with no finish at all. When used with included covers, these boxes provide excellent EMI/RFI protection.

HOUSING: Extruded aluminum alloy 6063-T5 or equivalent. Blue baked enamel per Federal Standard 595 #25109 over primer wash per DOD-P-15328 or no finish. (See table).

COVERS: Top and bottom 2.03 mm (.080) thick aluminum 1100-H14, with clear anodized finish per MIL-A-8625. Includes #4-40 x ¼" flathead screws.

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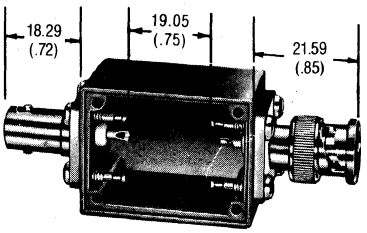
DIE CAST ALUMINUM BOXES

COMPONENT MOUNTING BOX, BNC FEMALE TO BNC MALE

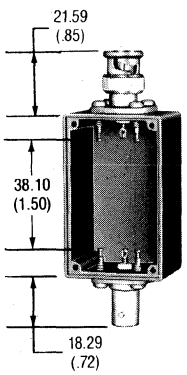
See Model 3753 for housing dimensions.
1ST END: BNC Female with solder turret terminal screws. Nominal Impedance: 50 Ohms.
2ND END: BNC Male with solder turret terminal screws. Nominal Impedance: 50 Ohms.
(Supplied with cover and cover screws.)
RATING: Operating Voltage: 500 VRMS Max.; + 150°C. (+302°F.) Max.



MODEL 3752

COMPONENT MOUNTING BOX, BNC MALE TO BNC FEMALE

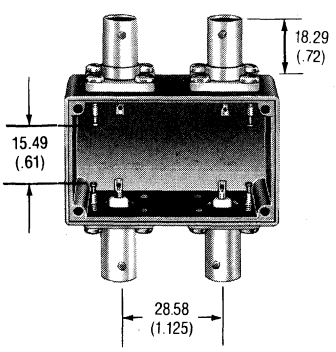
See Model 2417 for housing dimensions.
1ST END: BNC Male with solder turret terminal screws. Nominal Impedance: 50 Ohms.
2ND END: BNC Female with solder turret terminal screws. Nominal Impedance: 50 Ohms.
(Supplied with cover and cover screws.)
RATING: Operating Voltage: 500 VRMS Max.; + 150°C. (+302°F.) Max.



MODEL 3231

COMPONENT MOUNTING BOX, CROSS CONNECTIONS

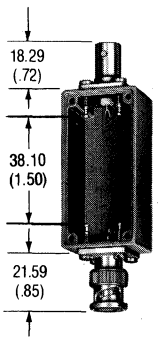
See Model 2417 for housing dimensions.
1ST END: BNC Females with solder turret terminal screws. Nominal Impedance: 50 Ohms.
2ND END: Same as first end.
(Supplied with cover and cover screws.)
RATING: Operating Voltage: 500 VRMS Max.; + 150°C. (+302°F.) Max.



MODEL 3234

COMPONENT MOUNTING BOX, BNC FEMALE TO BNC MALE

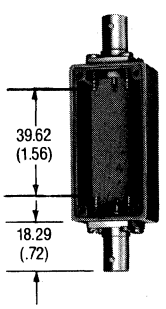
See Model 2397 for housing dimensions.
1ST END: BNC Female with solder turret screws. Nominal Impedance: 50 Ohms.
2ND END: BNC Male with solder turret screws. Nominal Impedance: 50 Ohms.
(Supplied with cover and cover screws.)
RATING: Operating Voltage: 500 VRMS Max.; + 150°C. (+302°F.) Max.



MODEL 2391

COMPONENT MOUNTING BOX, BNC FEMALE EACH END

See Model 2397 for housing dimensions.
1ST END: BNC Female with solder turret screws. Nominal Impedance: 50 Ohms.
2ND END: Same as first end.
(Supplied with cover and cover screws.)
RATING: Operating Voltage: 500 VRMS Max.; + 150°C. (+302°F.) Max.



MODEL 2390

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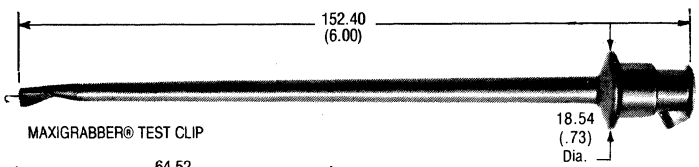
GRABBER™ TEST CLIPS

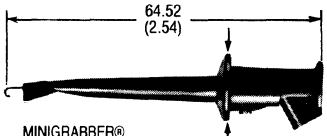
These plunger type action test clips are called Grabber test clips. The gold plated contact hook attaches rapidly to component leads and terminals. The specially designed tip (see illustration) slides easily on the 0.64 mm (.025) square wrapped wire terminals. The do-it-yourself Grabber test clips can be assembled quickly and easily by the user (see simplified instructions below). Grabber test clips can also be purchased as completed patch cords that are firmly molded together to provide a strong, reliable and integral unit.

FEATURES:

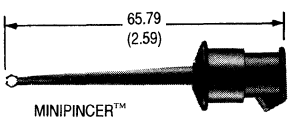
- Plunger type action between thumb and two fingers.
- Comfortable finger grip operation.
- Positive connection that won't pop off.
- No sharp teeth to damage or nick wires.



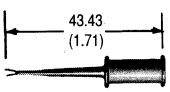
MAXIGRABBER® TEST CLIP



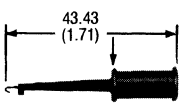
MINIGRABBER® TEST CLIP



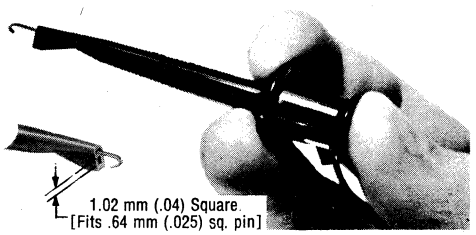
MINIPINCER™ TEST CLIP



SMD GRABBER® TEST CLIP



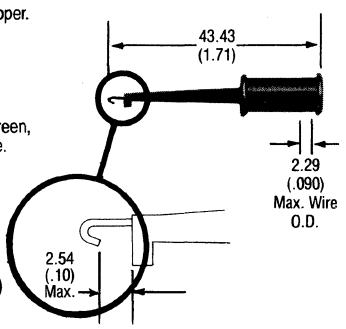
MICROGRABBER® TEST CLIP



DO-IT-YOURSELF MICROGRABBER® TEST CLIP

MATERIAL: Contact, beryllium copper.
FINISH: Gold plated.
INSULATION: Glass filled nylon.
RATING: 1000 WVDC; 3 Amps; + 102°C. (+216°F.) Max.
***STD COLOR:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

Kits available in Two and Ten Colors. (Models 4743 & 5524)



MODEL
4233-*

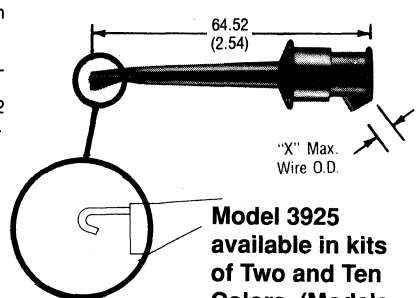
(See assembly details above.)

(Pkg. Ten Per Color)

DO-IT-YOURSELF MINIGRABBER® TEST CLIP

MATERIAL: Contact, beryllium copper.
FINISH: Gold plated.
INSULATION: Glass filled nylon.
RATING: 3000 WVDC; 12 Amps. + 102°C. (+216°F.) Max.
***STD COLOR:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

MODEL	"X" Dia.
3925-*	2.29 (.090)
4555-*	3.66 (.144)



(See assembly details above.)

Model 3925 available in kits of Two and Ten Colors. (Models 4176 & 5522)

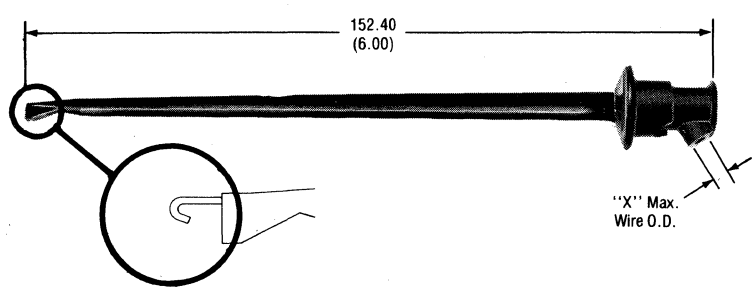
(Pkg. Ten Per Color)

DO-IT-YOURSELF MAXIGRABBER® TEST CLIP

The Maxigrabber® test clip is an extended do-it-yourself Grabber test clip designed specifically for high-rise packaging of electronic components where depth of testing point is a key factor. The Maxigrabber® test clip will fit entry holes as small as 6.35 mm (.250) dia. and the unit is completely field serviceable.
MATERIAL: Contact, beryllium copper.
FINISH: Gold plated.
INSULATION: Glass filled nylon.
RATING: 3000 WVDC; 12 Amps. + 102°C. (+216°F.) Max.
***STD COLOR:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

MODEL	"X" Dia.
4225-*	2.29 (.090)
4565-*	3.66 (.144)

(See assembly details above.)



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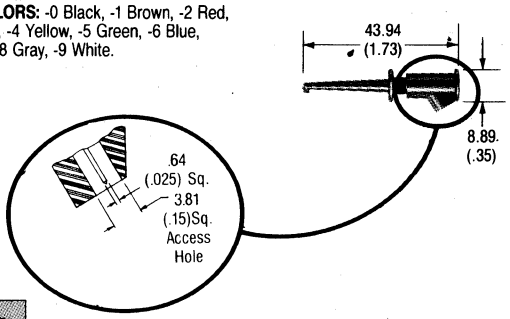
GRABBER™ TEST CLIPS

MICROGRABBER® TEST CLIP WITH 0.64 mm (.025) SQUARE PIN

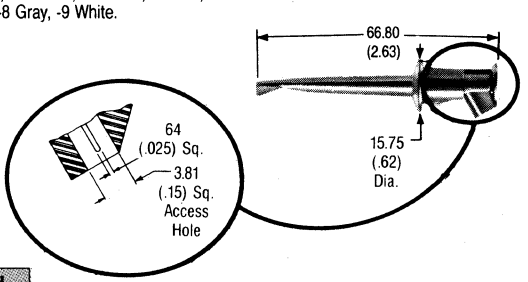
MATERIAL: Contact, beryllium copper. Square pin, phosphor bronze.
FINISH: Gold plated.
INSULATION: Glass filled nylon.
RATING: 1000 WVDC; 3 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.



MODEL
4521-*

MINIGRABBER® TEST CLIP WITH 0.64 mm (.025) SQUARE PIN

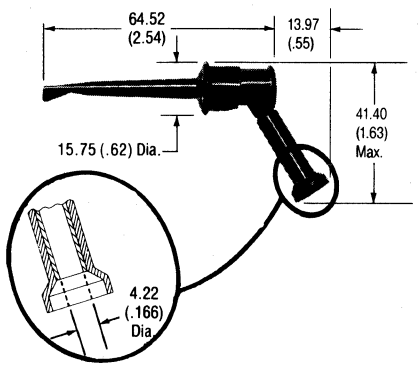
MATERIAL: Contact, beryllium copper. Square pin, phosphor bronze.
FINISH: Gold plated.
INSULATION: Glass filled nylon.
RATING: 2500 WVDC; 3 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.



MODEL
4587-*

NET 3.15

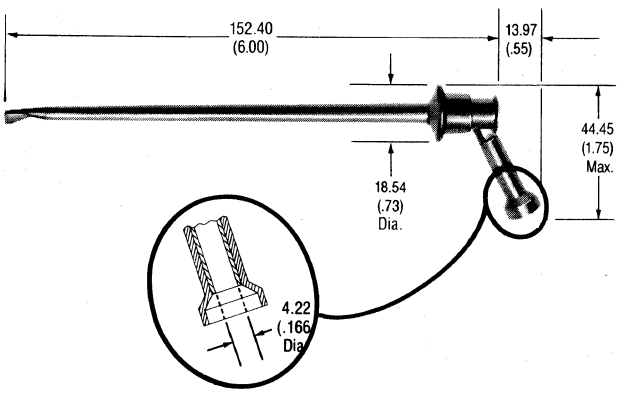
MINIGRABBER® TEST CLIP WITH BANANA JACK



This Minigrabber® test clip has a standard banana jack built right into the plunger. Excellent for attaching the Grabber test clip directly to the end of a banana plug patch cord.
1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated.
INSULATION: Glass filled nylon.
2ND END: Banana jack. Brass, nickel plated.
RATING: 3000 WVDC; 12 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

MODEL
4723-*

MAXIGRABBER® TEST CLIP WITH BANANA JACK



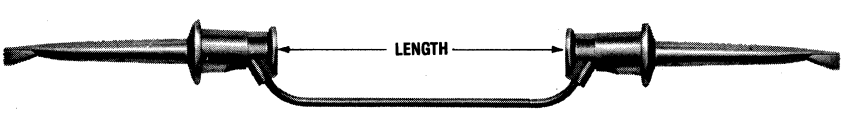
This Maxigrabber® test clip has a standard banana jack built right into the plunger. Excellent for attaching the Grabber test clip directly to the end of a banana plug patch cord.
1ST END: Maxigrabber® Test Clip. Contact, beryllium copper, gold plated.
INSULATION: Glass filled nylon.
2ND END: Banana jack. Brass, nickel plated.
RATING: 3000 WVDC; 12 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

MODEL
4724-*

MINIGRABBER® TEST CLIP EACH END

Kit available in Ten Colors. (Model 5523)

MODEL	Length
3781-8-**	203.2 (8.0)
3781-12-**	304.8 (12.0)
3781-18-*	457.2 (18.0)
3781-24-*	609.6 (24.0)
3781-36-*	914.4 (36.0)
3781-48-*	1219.2 (48.0)
3781-60-**	1524.0 (60.0)



1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated. Insulation, glass filled nylon.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: Same as first end.
RATING: 3000 WVDC; 5 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.
****STD COLORS:** -0 Black, -2 Red.

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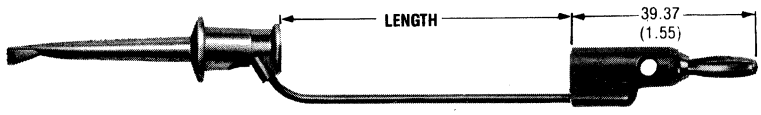
MINIGRABBER® TEST CLIP PATCH CORDS

MINIGRABBER® TEST CLIP TO STACKING BANANA PLUG

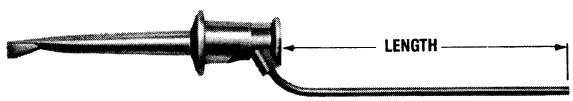


MODEL	Length
3782-12-*	304.8 (12.0)
3782-24-*	609.6 (24.0)
3782-36-*	914.4 (36.0)
3782-48-*	1219.2 (48.0)
3782-60-*	1524.0 (60.0)

1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated. Insulation, glass filled nylon.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: Stacking Banana Plug. Brass body, beryllium copper spring, nickel plated. Polypropylene insulation.

RATING: 3000 WVDC; 5 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

MINIGRABBER® TEST CLIP ONE END ONLY

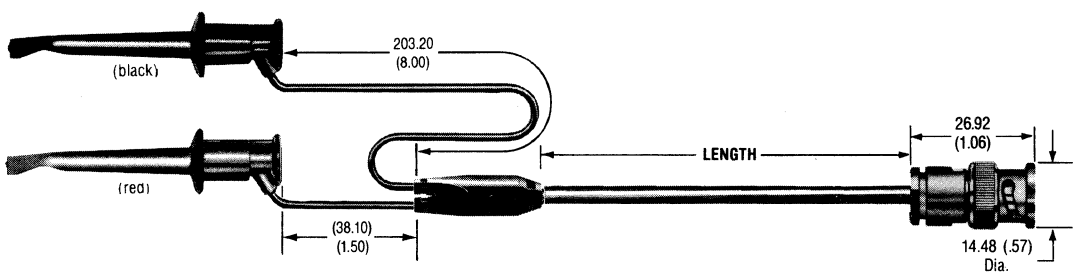


MODEL	Length
3780-6-**	203.2 (8.0)
3780-12-**	304.8 (12.0)
3780-24-*	609.6 (24.0)
3780-36-*	914.4 (36.0)
3780-48-*	1219.2 (48.0)
3780-60-**	1524.0 (60.0)

1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated. Insulation, glass filled nylon.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: None

RATING: 3000 WVDC; 5 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.
****STD COLORS:** -0 Black, -2 Red.

MINIGRABBER® TEST CLIPS TO BNC MALE

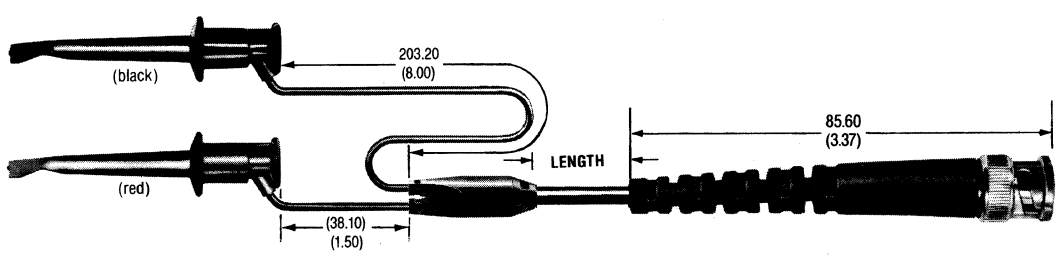


MODEL	Length
3787-C-18	457.2 (18.0)
3787-C-24	609.6 (24.0)
3787-C-36	914.4 (36.0)
3787-C-48	1219.2 (48.0)
3787-C-60	1524.0 (60.0)

1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated, insulation; glass filled nylon. One black and one red.
CABLE: Shielded coax., RG58C/U, 4.95 mm (.195) O.D. Y-Mold insulation; PVC, black.

2ND END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Nominal Impedance: 50 Ohms.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

MINIGRABBER® TEST CLIPS TO BNC MALE



RG58C/U	RG174/U	Length
5187-C-24	5187-K-24	609.6 (24.0)
5187-C-36	5187-K-36	914.4 (36.0)
5187-C-48	5187-K-48	1219.2 (48.0)
5187-C-60	5187-K-60	1524.0 (60.0)

1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated. Insulation; glass filled nylon. One black and one red.
CABLE: Type C, shielded coax., RG 58C/U, 4.95 mm (.195) O.D.; Type K, shielded coax., RG 174/U, 2.54 mm (.100) O.D. Y-Mold insulation; PVC, black.

2ND END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Nominal Impedance: 50 Ohms. Boot; PVC, black.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

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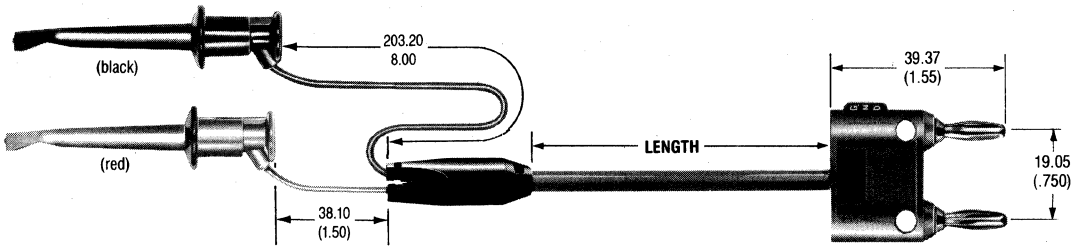
GRABBER™ PATCH CORDS

MINIGRABBER® TEST CLIPS TO DOUBLE BANANA PLUG



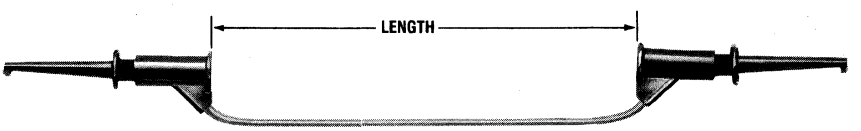
MODEL	Length
3786-C-18	457.2 (18.0)
3786-C-24	609.6 (24.0)
3786-C-36	914.4 (36.0)
3786-C-48	1219.2 (48.0)
3786-C-60	1524.0 (60.0)

1ST END: Minigrabber® Test Clip. Contact, beryllium copper, gold plated. Insulation; glass filled nylon. One black and one red.

CABLE: Shielded coax., RG 58C/U, 4.95 mm (.195) O.D., Y-Mold Insulation. PVC, Black.

2ND END: Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; polyethylene, black.
RATING: 1400 VRMS; +50°C. (+122°F.) Max.

MICROGRABBER® TEST CLIP EACH END



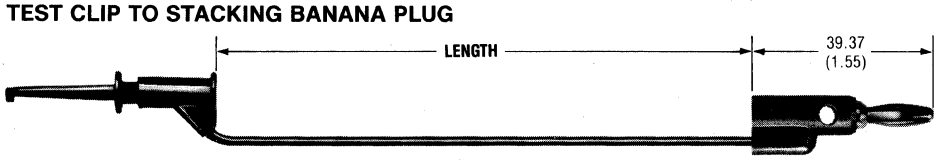
Kit available in Ten Colors. (Model 5525)

MODEL	Length
4613-12*	304.8 (12.0)
4613-24*	609.6 (24.0)
4613-36*	914.4 (36.0)
4613-48*	1219.2 (48.0)

1ST END: Micrograbber® Test Clip. Contact, beryllium copper, gold plated. Insulation, glass filled nylon.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D.

2ND END: Same as first end.
RATING: 1000 WVDC, 3 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

MICROGRABBER® TEST CLIP TO STACKING BANANA PLUG

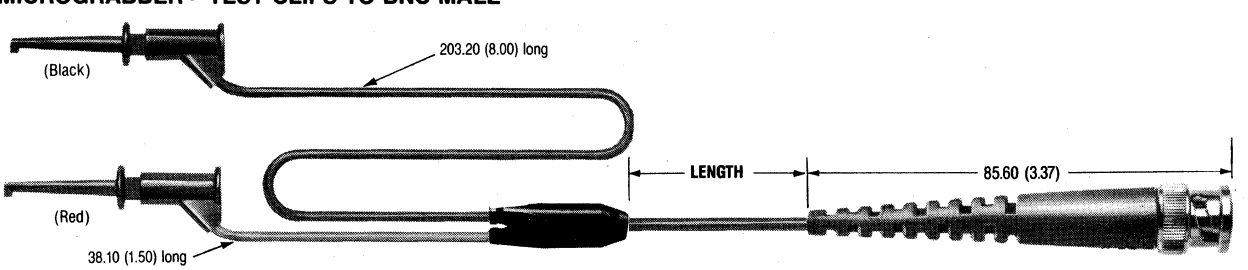


MODEL	Length
5053-12-*	304.8 (12.0)
5053-24-*	609.6 (24.0)
5053-36-*	914.4 (36.0)
5053-48-*	1219.2 (48.0)
5053-60-*	1524.0 (60.0)

1ST END: Micrograbber® Test Clip. Contact beryllium copper, gold plated. Insulation; glass filled nylon.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: Stacking Banana Plug. Brass body, beryllium copper spring, nickel plated. Polypropylene insulation.

RATING: 1000 WVDC; 3 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

MICROGRABBER® TEST CLIPS TO BNC MALE



RG 58C/U	RG 174/U	Length
4777-C-24	4777-K-24	609.6 (24.0)
4777-C-36	4777-K-36	914.4 (36.0)
4777-C-48	4777-K-48	1219.2 (48.0)
4777-C-60	4777-K-60	1524.0 (60.0)

1ST END: Micrograbber® Test Clip. Contact, beryllium copper, gold plated. Insulation; glass filled nylon. One black and one red.
CABLE: Shielded coax., RG 58C/U 4.95 mm (.195) O.D. or RG 174/U 2.54 mm (.100) O.D. Y-Mold insulation; PVC, black.

2ND END: Crimp BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Nominal Impedance: 50 Ohms. Boot; PVC, black.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

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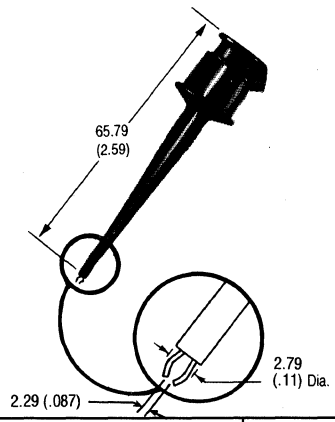
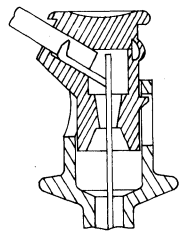
MINIPINCER™ TEST CLIPS

DO-IT-YOURSELF MINIPINCER™ TEST CLIP

This clip utlizes a snap-on cap and an IDC contact to provide a reliable, solderless connection. The lower contact has a pincer type action ideally suited for testing standard dip packages.

MATERIAL: Beryllium copper contact.
FINISH: Selectively gold plated.
INSULATION: Nylon
RATING: 1000 WVDC, 5 Amps, +80°C. (+176° F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.



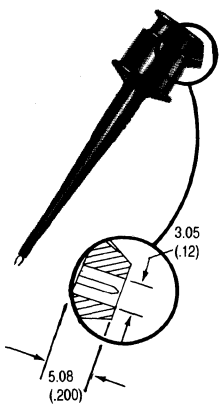


MODEL
5418-*

MINIPINCER™ TEST CLIP WITH 0.64 mm (.025) SQUARE PIN

This clip has similar pincer contact as Model 5418 (above) and includes recessed .64 mm (.025) square pin in cap.

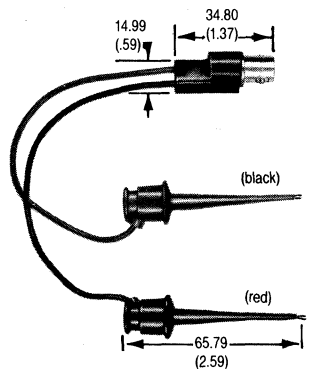
1ST END: Contact, beryllium copper. Selectively gold plated.
INSULATION: Nylon
2ND END: Square pin.
RATING: 1000 WVDC, 3 Amps, +80°C. (+176° F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.



MODEL
5430-*

BNC FEMALE TO MINIPINCER™ TEST CLIPS

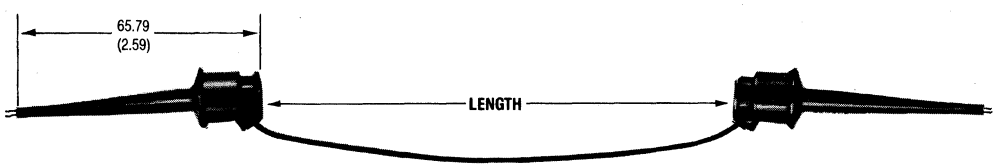
1ST END: BNC Female. Tarnish resistant plated brass body. Gold plated beryllium copper center contact. Black polypropylene insulation.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D. One black and one red.
2ND END: Minipincer™ Test Clips. Gold plated beryllium copper contact. Nylon insulation. One black and one red.
RATING: 500 VRMS, +55°C. (+131°F.) Max.



MODEL
5424

OVERALL LENGTH: 177.8 (7.0).

MINIPINCER™ TEST CLIP, EACH END

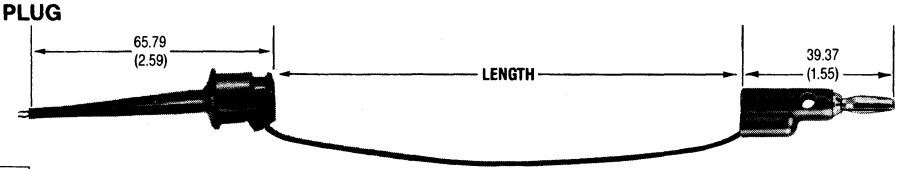


MODEL	Length
5419-8-*	203.2(8.0)
5419-12-*	304.8(12.0)
5419-18-*	457.2(18.0)
5419-24-*	609.6(24.0)
5419-36-*	914.4(36.0)
5419-48-*	1219.2(48.0)
5419-60-*	1524.0(60.0)

1ST END: Minipincer™ Test Clip. Selectively gold plated beryllium copper contact. Nylon insulation.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: Same as first end.

RATING: 1000 WVDC, 5 Amps, +80°C. (+176°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

MINIPINCER™ TEST CLIP TO STACKING BANANA PLUG



MODEL	Length
5421-12-*	304.8(12.0)
5421-24-*	609.6(24.0)
5421-36-*	914.4(36.0)
5421-48-*	1219.2(48.0)
5421-60-*	1524.0(60.0)

1ST END: Minipincer™ Test Clip. Selectively gold plated beryllium copper contact. Nylon insulation.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D.

2ND END: Stacking Banana Plug. Nickel plated brass body, beryllium copper spring. Polypropylene insulation.
RATING: 1000 WVDC, 5 Amps, +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

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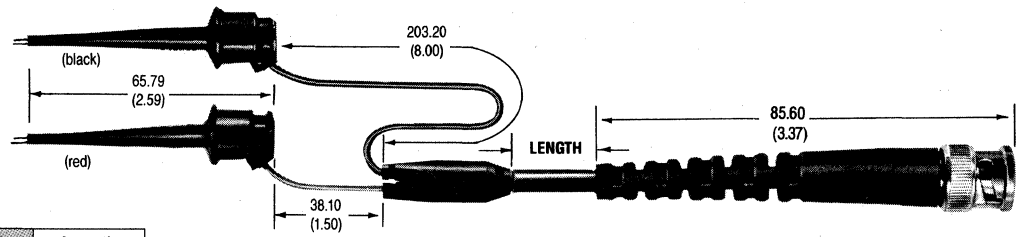
MINIPINCER™ TEST CLIPS

MINIPINCER™ TEST CLIPS TO BNC MALE



MODEL	Length
5423-C-18	457.2 (18.0)
5423-C-24	609.6 (24.0)
5423-C-36	914.4 (36.0)
5423-C-48	1219.2 (48.0)
5423-C-60	1524.0 (60.0)

1ST END: Minipincer™ Test Clips. Gold plated beryllium copper contact. Nylon insulation. One black and one red.
CABLE: Shielded coaxial, RG 58C/U, 4.95 mm (.195) O.D. Y-mold insulation; PVC, black.

2ND END: Crimp BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Boot; PVC, black.
RATING: 500 VRMS, +50°C. (+122°F.) Max.

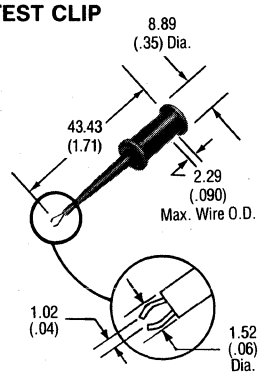
SMD GRABBER® TEST CLIPS

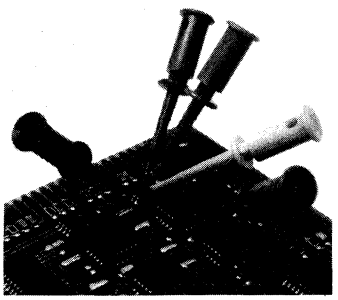
DO-IT-YOURSELF SMD GRABBER® TEST CLIP

This do-it-yourself test clip is especially suited for testing surface mounted packages on centers as small as 0.76 mm (.030). Pincer-like contact grasps individual legs of SMD's such as the SOIC, SOJ, PCC, etc. Its circular design and small size have been developed for easy use and handling.
MATERIAL: Contact, stainless steel.
FINISH: Selectively gold plated on tip.
INSULATION: Glass filled nylon.
RATING: 1000 WVDC; 0.5 Amp; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

MODEL
5243-*

Kit available in Ten Colors. (Model 5231)





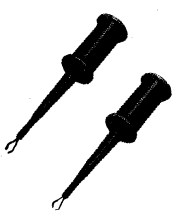
APPLICATION PHOTO

(Pkg. 10 Per Color)

DO-IT-YOURSELF SMD GRABBER® TEST CLIP KIT

Kit contains 2 pcs. of Model 5243.

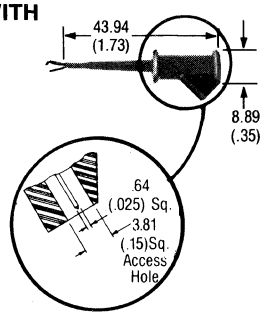
MATERIAL: Contact, stainless steel.
FINISH: Selectively gold plated on tip.
INSULATION: Glass filled nylon.
RATING: 1000 WVDC; 0.5 Amps; +102°C. (+216°F.) Max.
KIT CONTAINS: -02, one black and one red; -00, two black; -11, two brown; -22, two red; -33, two orange; -44, two yellow; -55, two green; -66, two blue; -77, two violet; -88, two gray; -99, two white.



MODEL
5231-*

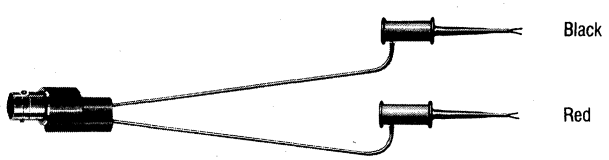
SMD GRABBER® TEST CLIP WITH 0.64 mm (.025) SQUARE PIN

1ST END: Contact, stainless steel, selectively gold plated.
INSULATION: Glass filled nylon.
2ND END: Square pin, phosphor bronze, gold plated.
RATING: 1000 WVDC; 0.5 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.



MODEL
5360

SMD GRABBER® TEST CLIPS TO BNC FEMALE



OVERALL LENGTH: 177.8 mm (7.0)

1ST END: BNC Female. Brass body, tarnish resistant plated. Center contact, beryllium copper, gold plated. Nominal Impedance: 50 Ohms. Insulation, polypropylene, black.
WIRE: 22 AWG, 26 x 36 t.c., PVC insulated, 1.63 mm (.064) O.D. One black and one red.

2ND END: SMD GRABBER test clips. Contact, selectively gold plated stainless steel. Insulation, glass filled nylon. One black and one red.
RATING: Operating Voltage: 500 VRMS Max.; +55°C. (+131°F.) Max.

MODEL
5305

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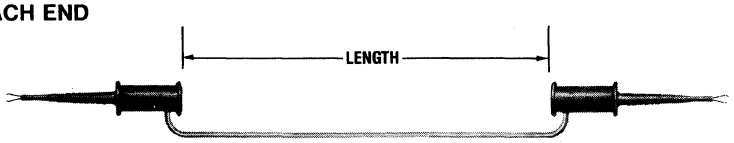
SMD GRABBER® TEST CLIPS

SMD GRABBER® TEST CLIP EACH END

Kit available in Ten Colors. (Model 5521)

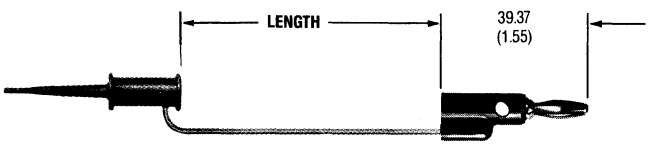


MODEL	Length
5301-6-*	152.4 (6.0)
5301-12-*	304.8 (12.0)
5301-24-*	609.6 (24.0)
5301-36-*	914.4 (36.0)

1ST END: SMD GRABBER® Test Clip. Contact, selectively gold plated stainless steel. Insulation, glass filled nylon.
WIRE: 22 AWG, 26 x 36 t.c., PVC insulated, 1.63 mm (.064) O.D.

2ND END: Same as first end.
RATING: 1000 WVDC; 0.5 Amps; +102°C. (+216°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

SMD GRABBER® TEST CLIP TO STACKING BANANA PLUG

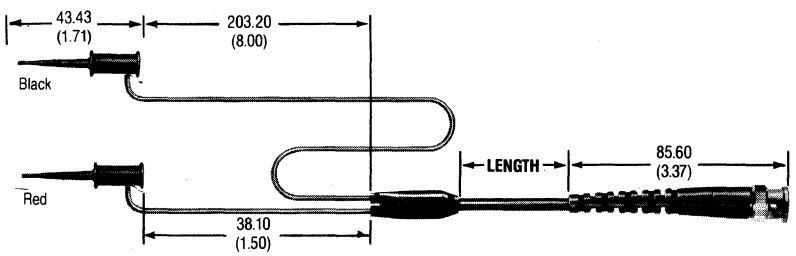


MODEL	Length
5302-12-*	304.8 (12.0)
5302-24-*	609.6 (24.0)
5302-36-*	914.4 (36.0)

1ST END: SMD GRABBER® Test Clip. Contact, selectively gold plated stainless steel. Insulation, glass filled nylon.
WIRE: 22 AWG, 26 x 36 t.c., PVC insulated, 1.63 mm (.064) O.D.

2ND END: Stacking Banana Plug. Brass body, beryllium copper spring, nickel plated. Polypropylene insulation.
RATING: 1000 WVDC; 0.5 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

SMD GRABBER® TEST CLIP TO BNC MALE

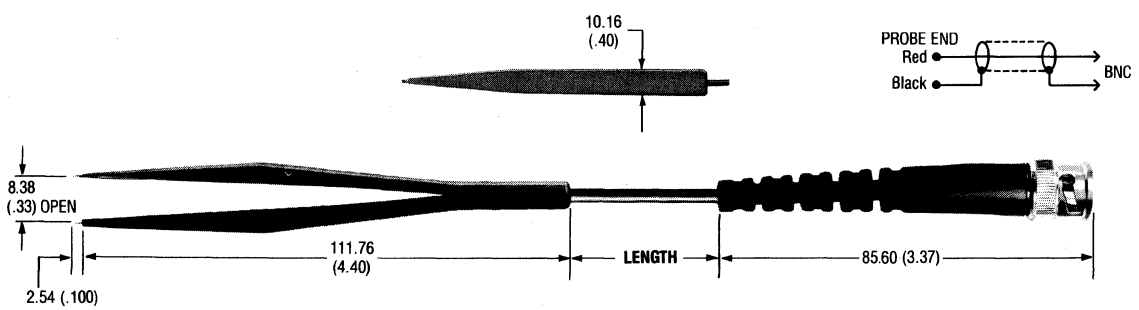


MODEL	Length
5304-K-24	609.6 (24.0)
5304-K-36	914.4 (36.0)

1ST END: SMD GRABBER® test clips. Contact, selectively gold plated stainless steel. Insulation, glass filled nylon. One black and one red.
CABLE: Shielded coax., RG 174/U, 2.54 mm (.100) O.D. Y-Mold insulation, PVC, black.

2ND END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Nominal Impedance: 50 Ohms. Boot, PVC, black.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

SMD TEST TWEEZER™ TO BNC MALE



MODEL	Length
5142-K-48	1219.2 (48.0)

1ST END: SMD Test Tweezer™. Tips, beryllium copper, gold plated. Insulation; glass filled nylon, black and red.
CABLE: Shielded coaxial, RG174/U, 2.54 mm (.100) O.D.

2ND END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Boot; PVC, black.
RATING: 400 VRMS; 3 Amps; +50°C. (+122°F.) Max.

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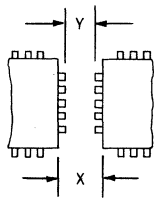
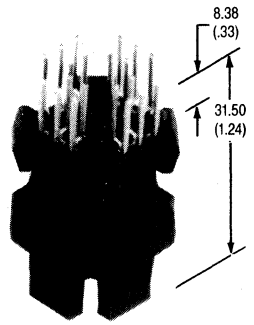
SMD PRODUCTS

QUAD CLIP™ TEST ADAPTER

PATENT PENDING

These test adapters are designed for Plastic Leaded Chip Carriers (PCC or PLCC) with "J" leads. A 'snap-ping' design allows this clip to fit directly onto IC providing hands-free testing.
UPPER: .635 mm (.025) Square Pins. Phosphor bronze, gold plated.
INSULATION: Glass filled nylon, gray.
LOWER: Contacts. Beryllium copper, gold plated.
RATING: 500 VRMS, 1 Amp. +102°C. (+216°F.) Max.





MODEL	No. of Pins
5279	20
5280	28
5281	44
5312	52
5401	68
5402	84

Quad Clip assortment available in a kit. (Model 5515)

	X Min.	Y Min.
Single Chip Testing	3.05 (.120)	2.79 (.110)
Adjacent Testing	8.26 (.325)	7.24 (.285)

SOIC CLIP™ TEST ADAPTER

These test clips are designed especially for testing Small Outline Integrated Circuits (SOIC and SOJ). The SOIC CLIP™ test clip assures a positive connection and provides hands-free testing.
FEATURES
- 0.64 mm (.025) × 0.71 mm (.028) square access pins on upper end permit either individual pin testing or the use of 2.54 mm (.100) spaced connectors.
- Molded barrier between each contact allows connections to be made on live boards without accidental shorting of adjacent contacts.
- Can be used with Jumper Cables.

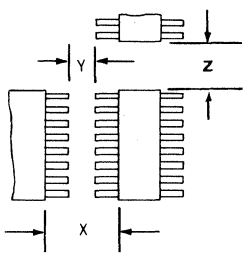
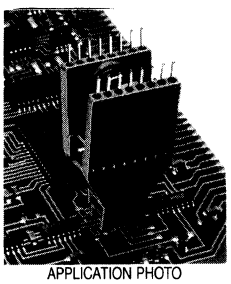


Fig. 1


APPLICATION PHOTO

SOIC CLIP™ TEST ADAPTER

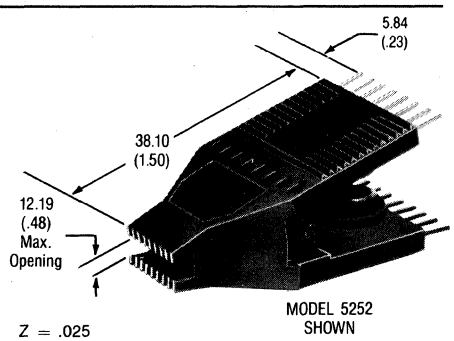
These test clips have a spring design similar to our Dip Clips. The clip design allows testing of wide or narrow body chips and smaller sizes of PLCC.
UPPER: 0.64 mm (.025) × 0.71 mm (.028) Square Pin. Gold plated phosphor bronze.
INSULATION: Glass filled nylon, blue.
LOWER: Contact. Gold plated beryllium copper.
RATING: 500 VRMS; 1 Amp; +102°C. (+216°F.) Max.

SOIC Clip assortment available in a kit. (Model 5514)

MODEL	No. of Pins
5250	8
5251	14
5252	16
5253	20
5254	24
5437	28

See Fig. 1

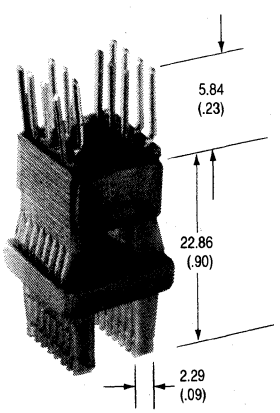
	X Min.	Y Min.
Single Chip Testing	4.06 (.160)	1.52 (.060)
Narrow Body (Adjacent)	15.24 (.600)	12.70 (.500)
Wide Body (Adjacent)	8.51 (.335)	5.97 (.235)



Z = .025
X No. of
Contacts

SNAP RING SOIC CLIP™ 14 PIN TEST ADAPTER

This clip utilizes the 'snap-ring' design as used in our Quad Clip™ test clips for a more secure fit. Smaller clip allows testing of devices on high density boards.
UPPER: 0.64 mm (.025) × 0.71 mm (.028) Square Pins with double row 2.54 mm (.100) spacing. Gold plated phosphor bronze.
INSULATION: Glass filled nylon, blue.
LOWER: Contacts. Gold plated phosphor bronze.
RATING: 500 VRMS, 1 Amp. +102°C. (+216°F.) Max.



See Fig. 1

	X Min.	Y Min.	Z Min.
Single Chip Testing	4.06 (.160)	1.52 (.060)	4.57 (.180)
Adjacent Testing	9.14 (.360)	6.60 (.260)	4.57 (.180)

MODEL
5413

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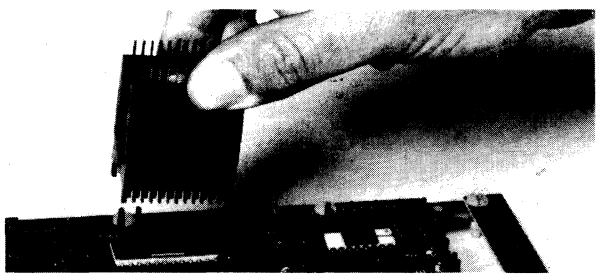
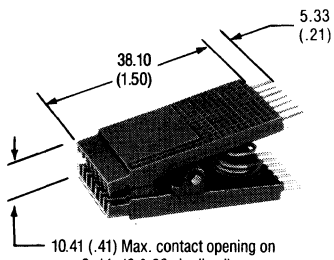
DIP CLIP™ IC TEST ADAPTERS

Pomona Electronics' DIP CLIP™ test clips are designed especially for testing dual-in-line IC packages on high-density P.C. boards. This clip has many built-in features that assure a positive electrical connection and at the same time provide hands-free testing. The high density DIP CLIP™ test clips are used for ultra-dense packaged chips located adjacent to each other on 2.54 mm (.100) spacing.
MATERIAL: Contact. Tarnish resistant nickel silver or gold plated beryllium copper. Stainless steel hinge pin and spring.
INSULATION: Glass filled nylon, blue.
RATING: 500 VRMS; 1 Amp; +102°C. (+216°F.) Max.

FEATURES

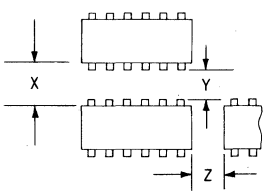
- Contacts 1.02 mm (.040) wide on lower end are serrated for good electrical connection.
- 0.64 mm (.025) × 0.71 mm (.028) square serrated test points on upper end will accept wire wraps or mini test clips.
- Molded barrier between each contact allows connections to be made on live boards without accidental shorting of adjacent contacts.
- Can be used as an insertion and removal tool for DIPS.





STANDARD
(5014 Shown)

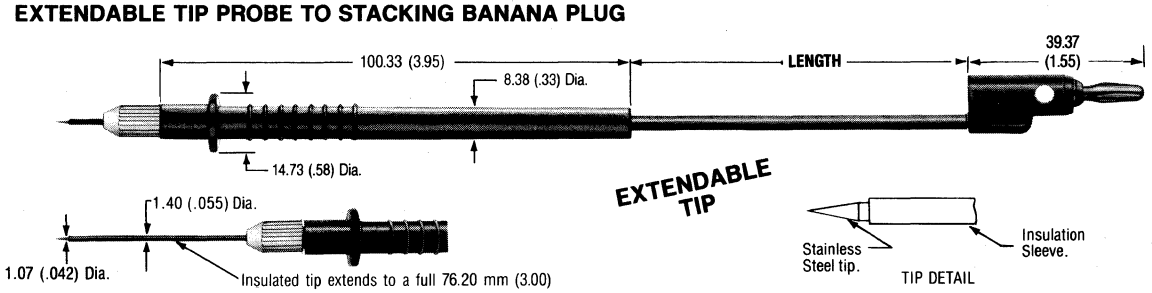
MODEL	No. of Pins	Contact Material	Type
5108	8	GoldPlated Beryllium Copper	Standard
5208	8	Gold Plated Beryllium Copper	High Density
5014	14	Spring Tempered Nickel Silver	Standard
5114	14	Spring Tempered Nickel Silver	High Density
5214	14	Gold Plated Beryllium Copper	Standard
5314	14	Gold Plated Beryllium Copper	High Density
3916A	16	Spring Tempered Nickel Silver	Standard
4236A	16	Spring Tempered Nickel Silver	High Density
5116	16	Gold Plated Beryllium Copper	Standard
5216	16	Gold Plated Beryllium Copper	High Density
5120	20	Gold Plated Beryllium Copper	Standard
5220	20	Gold Plated Beryllium Copper	High Density
4124A	24	Spring Tempered Nickel Silver	Standard
4324A	24	Spring Tempered Nickel Silver	High Density
5124	24	Gold Plated Beryllium Copper	Standard
5224	24	Gold Plated Beryllium Copper	High Density
4140A	40	Spring Tempered Nickel Silver	Standard
4340A	40	Spring Tempered Nickel Silver	High Density
5140	40	Gold Plated Beryllium Copper	Standard
5240	40	Gold Plated Beryllium Copper	High Density



	X Min.	Y Min.	Z Min.
Single Chip Testing Standard	3.30 (.130)	1.91 (.075)	1.02 (.040)
Single Chip Testing High Density	2.67 (.105)	1.27 (.050)	1.02 (.040)
Adjacent	7.62 (.300)	5.72 (.225)	2.03 (.080)

MINIATURE SIZE TEST PROBES

EXTENDABLE TIP PROBE TO STACKING BANANA PLUG



Now you can 'reach out' to get at those hard-to-reach test points with this miniature extendable test probe. The steel tip is very sharp, allowing penetration of contaminants or conformal coatings. The tip is insulated up to the point, providing protection from accidental shorting to adjacent components.

MODEL	Length
5044-48-*	1219.2(48.0)

1ST END: Extension Probe. Collet, Brass. Insulation; nylon. Tip, stainless steel. Insulation; Kynar. Chuck nut, nylon.
WIRE: 18 AWG, 65 x 36 t.c., PVC insulated. 3.66 mm (.144) O.D.
2ND END: Stacking Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation: polypropylene.
RATING: 1500 VAC/DC; 3 Amps Max.; +55°C. (+131°F.) Max.
***COLORS AVAILABLE:** -0 Black, -2 Red.

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MULTIMETER REPLACEMENT TEST LEADS

These test leads were designed specifically as replacements for lost or damaged multimeter leads. Sheathed banana plugs or jacks fit most multimeters made by Amprobe, B&K, Beckman, Fluke, Simpson and Triplett. (See tab block for specific models.)

Meter Group	FIT THESE INSTRUMENTS*
A	Beckman before August, 1983 Amprobe Models
B	Simpson
C	Triplett
D	Beckman after August,1983 Fluke B & K

*See Pomona General Catalog for more complete listing.

MULTIMETER TEST LEAD KIT

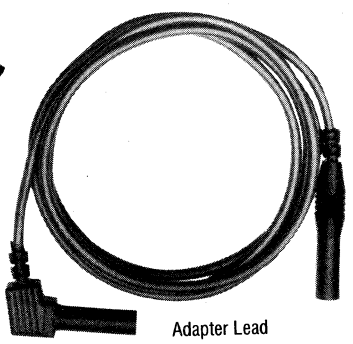
Pomona Electronics' multimeter test lead kit, with maximum flexibility, allows the operator to change from a test probe to a Minigrabber® Test Clip, Alligator or spade lug configuration. Simply detach the probe from the test lead and attach the desired device.
Test leads feature heat resistant silicone wire. The unique sheathed banana plug on the test lead mates easily with the banana receptacles mounted on each device. This interconnection is held secure by dynamic friction created by dissimilar plastics. Once this force is overcome, the test lead can easily be removed.

Test Probe

Alligator Clip

Spade Lug

Minigrabber® to Banana Jack


Adapter Lead

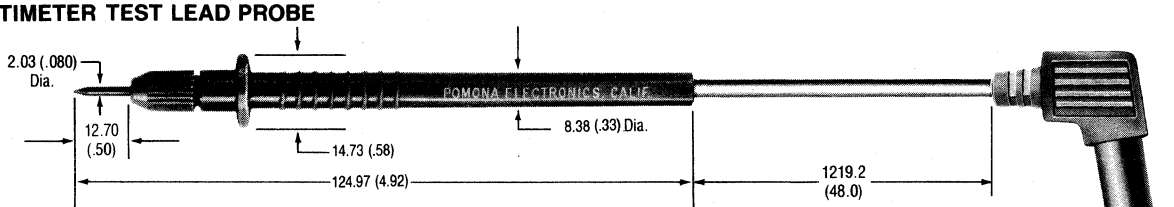
NEW

MODEL	Meter Group
5592	A
5593	B
5594	C
5543	D

Kit contains 2 pcs. of each component, one red and one black.
Test Probe
MATERIAL: Brass.
FINISH: Nickel plated.
INSULATION: Nylon.
RATING: 1500 V AC/DC Max.
10 Amps Max., Insulation Resistance: 5000 Megohms Min.

Spade Lug
Alligator Clip
Adapter Lead
Minigrabber® Test Clip to Banana Jack Lead

MULTIMETER TEST LEAD PROBE

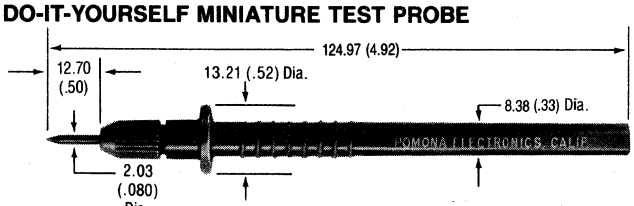


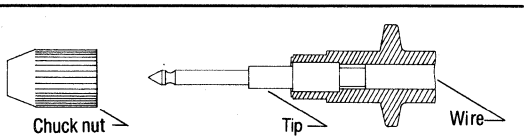
1ST END: Miniature Test Probe. Needle tip, brass, nickel plated. Insulation; nylon.
WIRE: 18 AWG, 65 × 36 t.c., PVC insulated. 3.66 mm (.144) O.D.

2ND END: Models 5434 & 5435; Sheathed Banana Jack. Copper alloy, nickel plated. Insulation; PVC.
Models 5433 & 5436; Sheathed Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; PVC. Tip; polypropylene, orange.
RATING: 1500 V AC/DC Max; 7 Amps; +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

MODEL	Meter Group
5433-48*	A
5434-48*	B
5435-48*	C
5436-48*	D

DO-IT-YOURSELF MINIATURE TEST PROBE





Install this miniature probe on the end of any test lead having a maximum O.D. of 2.92 mm (.115) dia. and wire gauge of 22 to 18 AWG. Simply remove chuck nut and tip. Strip wire 3.18 mm (.125) and feed through test probe body. Solder or crimp to small end of tip. Insert tip into test probe and tighten chuck nut.

MATERIAL: Brass.
FINISH: Nickel plated.
INSULATION: Nylon.
RATING: 1200 VAC/DC; 7 Amps; +80°C. (+176°F.) Max.
***COLORS AVAILABLE:** -0 Black, -2 Red.
NOTE: This model supersedes model 5065.

MODEL
5432-*

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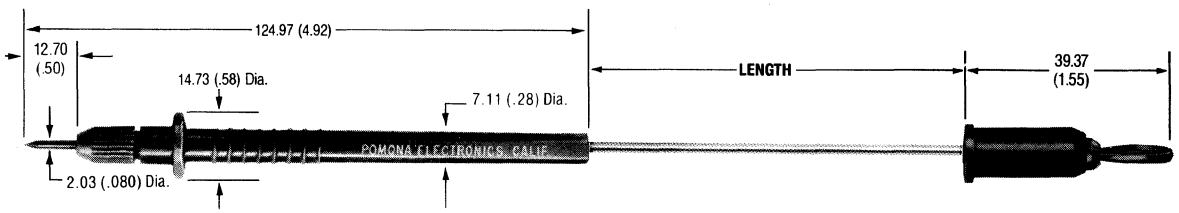
MINIATURE SIZE TEST PROBES

These slim miniature test probes feature a sharp replaceable needle tip. The tip easily pierces varnish or plating to give a good electrical reading.

MINIATURE TEST PROBE TO BANANA PLUG

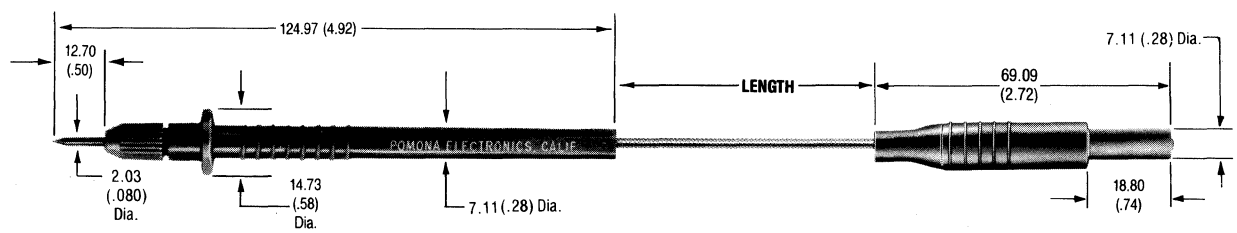


MODEL	Length
4410-48*	1219.2 (48.0)

1ST END: Miniature Test Probe. Chuck, brass, nickel plated. Replaceable needle tip, stainless steel. Insulation; nylon.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D.

2ND END: Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; polypropylene.
RATING: 1200 V AC/DC Max.; 5 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

MINIATURE TEST PROBE TO RETRACTABLE SHEATH BANANA PLUG

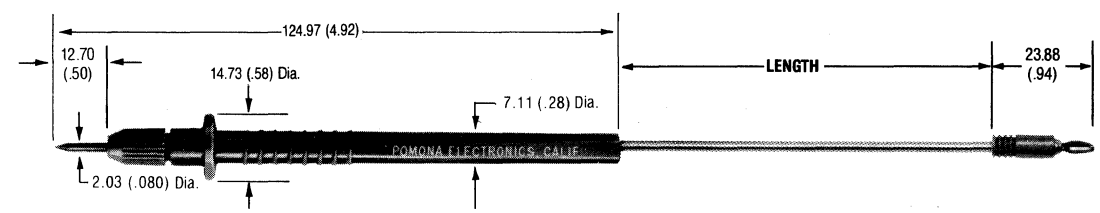


MODEL	Length
5048-48-*	1219.2 (48.0)

1ST END: Miniature Test Probe. Chuck, brass, nickel plated. Replaceable needle tip, stainless steel. Insulation; nylon.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: Sheathed Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; nylon.

RATING: 1200 V AC/DC Max.; 5 Amps; +80°C. (+176°F.) Max.
NOTE: This model supersedes model 5049.
***STD COLORS:** -0 Black, -2 Red.

MINIATURE TEST PROBE TO MINIATURE BANANA PLUG



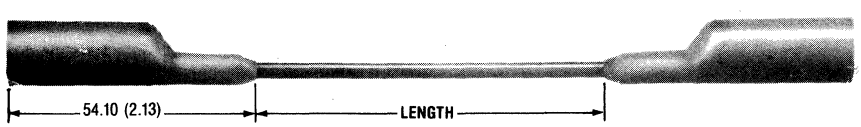
MODEL	Length
4847-48*	1219.2 (48.0)

1ST END: Miniature Test Probe. Chuck, brass, nickel plated. Replaceable needle tip, stainless steel. Insulation; nylon.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D.
2ND END: Miniature Banana Plug. Brass body, beryllium copper spring, gold plated. Insulation; polypropylene.

RATING: 1200 V AC/DC Max.; 5 Amps; +55°C. (+131°F.) Max.
NOTE: This model supersedes model 4071.
***STD COLORS:** -0 Black, -2 Red.

PATCH CORDS

ALLIGATOR CLIP EACH END



MODEL	Length
AL-B-4*	101.6 (4.0)
AL-B-8*	203.2 (8.0)
AL-B-12*	304.8 (12.0)
AL-B-24*	609.6 (24.0)
AL-B-36*	914.4 (36.0)
AL-B-48*	1219.2 (48.0)
AL-B-60*	1524.0 (60.0)

1ST END: Alligator Clip. Steel, nickel plated. Insulation; vinyl.
WIRE: 18 AWG, 65 × 36 t.c., PVC insulated, 3.66 mm (.144) O.D.

2ND END: Same as first end.
RATING: 5000 WVDC; 5 Amps; +50°C. (+122°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

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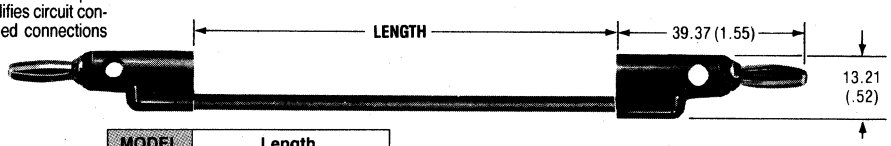
STANDARD BANANA PLUG PATCH CORDS

STACKING STANDARD BANANA PLUG EACH END

Multiple stacking feature accommodates the most complex stacking; keeps circuitry neater. Greatly simplifies circuit connections and changes. Reliable solderbonded connections withstand pull test in excess of 50 lbs.



MODEL	Length
B-4 *	101.6(4.0)
B-8 *	203.2(8.0)
B-12*	304.8(12.0)
B-18*	457.2(18.0)
B-24*	609.6(24.0)
B-36*	914.4(36.0)
B-48*	1219.2(48.0)
B-60*	1524.0(60.0)
B-72*	1829.0(72.0)

FINISH: Nickel plated.
***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.

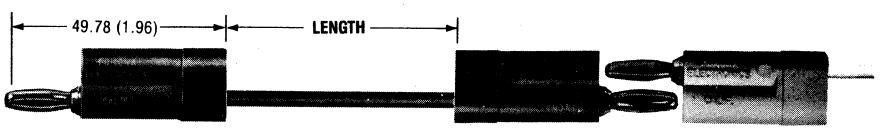
MODEL	Length
2948-12-*	304.8(12.0)
2948-24-*	609.6(24.0)
2948-36-*	914.4(36.0)
2948-48-*	1219.2(48.0)
2948-60-*	1524.0(60.0)

FINISH: Gold plated.
***STD COLORS:** -0 Black, -2 Red.

1ST END: Stacking Banana Plug. Brass body; beryllium copper spring, Insulation; polypropylene.
WIRE :18 AWG, 65 x 36 t.c., PVC insulated, 3.66 mm (.144) O.D.
2ND END: Same as first end.
RATING: 5000 WVDC; 15 Amps; +55°. (+131°F.) Max.

EXTENSION STACKING BANANA PLUG EACH END

Dual purpose. Insulates all hot leads when used as an extension cord. Endless extension couplings possible with any banana plug patch cord.

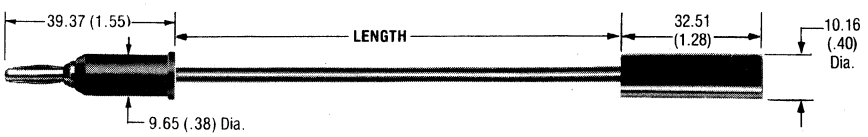


MODEL	Length
HB-4**	101.6 (4.0)
HB-8**	203.2 (8.0)
HB-12**	304.8 (12.0)
HB-18**	457.2 (18.0)
HB-24*	609.6 (24.0)
HB-36*	914.4 (36.0)
HB-48*	1219.2 (48.0)
HB-60*	1524.0 (60.0)

1ST END: Extension Stacking Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; polypropylene.
WIRE: 18 AWG, 65 x 36 t.c., PVC insulated, 3.66 mm (.144) O.D.
2ND END: Same as first end.
RATING: 5000 WVDC, 15 Amps; +55°C. (+131°F.) Max.

***STD COLORS:** -0 Black, -1 Brown, -2 Red, -3 Orange, -4 Yellow, -5 Green, -6 Blue, -7 Violet, -8 Gray, -9 White.
****STD COLORS:** -0 Black, -2 Red.

BANANA PLUG TO IN-LINE BANANA JACK



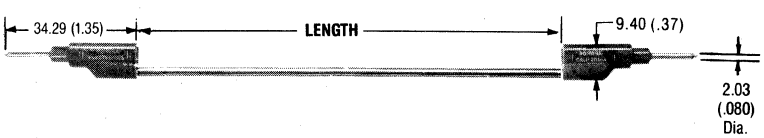
MODEL	LENGTH
4702-12*	304.8(12.0)
4702-18*	457.2(18.0)
4702-24*	609.6(24.0)
4702-36*	914.4(36.0)
4702-48*	1219.2(48.0)
4702-60*	1524.0(60.0)

Dual purpose. Insulates all hot leads when used as an extension cord. Endless extension couplings possible with any banana plug patch cord.
1ST END: Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; polypropylene.
WIRE: 18 AWG, 65 × 36 t.c., PVC insulated, 3.66 mm (.144) O.D.

2ND END: In-line Banana Jack. Brass, nickel plated. Insulation; polypropylene.
RATING: 5000 WVDC; 15 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

STACKING PIN TIP PLUG, EACH END

A must in circuit designing and testing with instruments that utilize tip jacks.



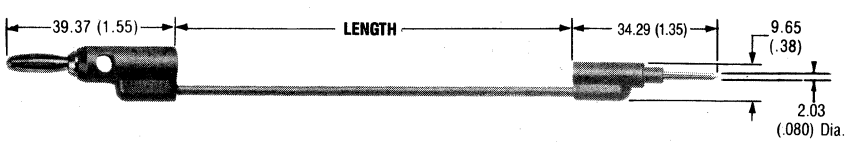
MODEL	LENGTH
P-4*	101.6(4.0)
P-8*	203.2(8.0)
P-12*	304.8(12.0)
P-18*	457.2(18.0)
P-24*	609.6(24.0)
P-36*	914.4(36.0)
P-48*	1219.2(48.0)
P-60*	1524.0(60.0)

1ST END: Stacking Pin Tip Plug. Brass body, beryllium copper spring, gold plated. Insulation; polypropylene.
WIRE: 20 AWG. 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D.

2ND END: Same as first end.
RATING: 3000 WVDC; 5 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

STACKING BANANA PLUG TO STACKING PIN TIP PLUG

Adapts to equipment using banana jacks and pin jacks. Banana plug and pin tip allow vertical stackup.



MODEL	LENGTH
1126-4*	101.6(4.0)
1126-8*	203.2(8.0)
1126-12*	304.8(12.0)
1126-18*	457.2(18.0)
1126-24*	609.6(24.0)
1126-36*	914.4(36.0)
1126-48*	1219.2(48.0)
1126-60*	1524.0(60.0)

1ST END: Stacking Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; polypropylene.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated. 2.21 mm (.087) O.D.

2ND END: Stacking Pin Tip Plug. Brass body, beryllium copper spring, gold plated. Insulation; polypropylene.
RATING: 3000 WVDC; 5 Amps; +55°C. (+131°F.) Max.
***STD COLORS:** -0 Black, -2 Red.

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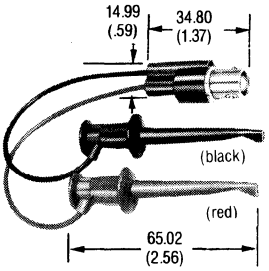
MOLDED BREAKOUTS

BNC FEMALE TO MINIGRABBER® TEST CLIPS

This molded breakout converts a coaxial cable with a BNC male to a test cable with clips.
1ST END: BNC Female. Brass body, tarnish resistant plated. Center contact, beryllium copper, gold plated. Nominal Impedance: 50 Ohms. Insulation; polypropylene, black.
WIRE: 20 AWG, 41 x 36 t.c., PVC insulated, 2.21 mm (.087) O.D. One black and one red.
2ND END: Minigrabber®. Contacts, beryllium copper, gold plated. Glass filled nylon insulation. One black and one red.
RATING: Operating Voltage: 500 VRMS Max.; +55°C. (+131°F.) Max.

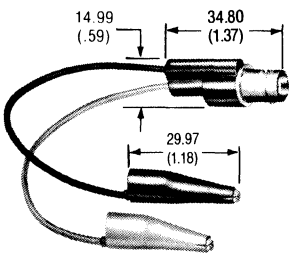


OVERALL LENGTH: 177.8 mm (7.0).

MODEL
3788

BNC FEMALE TO TEST CLIPS

1ST END: BNC Female. Brass body, tarnish resistant plated. Center contact, beryllium copper, gold plated. Nominal Impedance: 50 Ohms. Insulation; polypropylene, black.
WIRE: 18 AWG on alligator clips. 20 AWG on minigator clips. One black and one red.
2ND END: Alligator clips. Steel, nickel plated. Minigators. Steel, cadmium plated. Vinyl boots, one black and one red.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

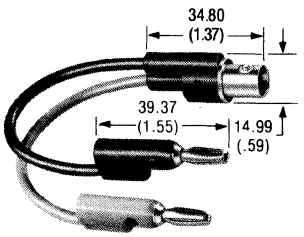


OVERALL LENGTH: 177.8 mm(7.0)

MODEL	
2630	(Alligator Clips)
2631	(Minigator Clips)

BNC FEMALE TO STACKING BANANA PLUGS

1ST END: BNC Female. Brass body, tarnish resistant plated. Center contact, beryllium copper, gold plated. Nominal Impedance: 50 Ohms. Insulation; polypropylene, black.
WIRE: 18 AWG, 65 × 36 t.c., PVC insulated, 3.66 mm (.144) O.D. One black and one red.
2ND END: Stacking Banana Plugs. Brass body, beryllium copper spring, nickel plated. Insulation; polypropylene. One black and one red.
RATING: Operating Voltage: 500 VRMS Max.; +55°C. (+131°F.) Max.

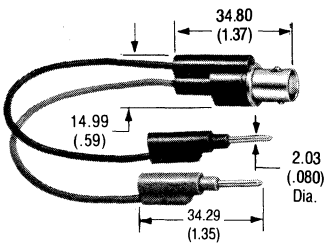


OVERALL LENGTH: 177.8 mm(7.0)

MODEL
3073

BNC FEMALE TO STACKING PIN TIP PLUGS

1ST END: BNC Female. Brass body, tarnish resistant plated. Center contact, beryllium copper, gold plated. Nominal Impedance: 50 Ohms. Insulation; polypropylene, black.
WIRE: 20 AWG, 41 × 36 t.c., PVC insulated, 2.21 mm (.087) O.D. One black and one red.
2ND END: Stacking Pin Tip Plugs. Brass, gold plated. Insulation; polypropylene. One black and one red.
RATING: Operating Voltage: 500 VRMS Max.; +55°C. (+131°F.) Max.

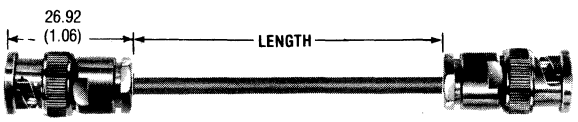


OVERALL LENGTH: 177.8 mm(7.0)

MODEL
3221

CABLE ASSEMBLIES

BNC MALE EACH END



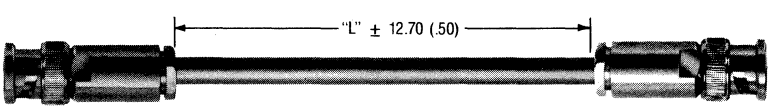
Shielded Mic Cable 50 Ohms	RG58C/U 50 Ohms	RG59B/U 75 Ohms	RG62A/U 93 Ohms	Length
BNC-B-18	BNC-C-18	BNC-E-18	BNC-M-18	457.2(18.0)
BNC-B-24	BNC-C-24	BNC-E-24	BNC-M-24	609.6(24.0)
BNC-B-30	BNC-C-30	BNC-E-30	BNC-M-30	762.0(30.0)
BNC-B-36	BNC-C-36	BNC-E-36	BNC-M-36	914.4(36.0)
BNC-B-48	BNC-C-48	BNC-E-48	BNC-M-48	1219.2(48.0)
BNC-B-60	BNC-C-60	BNC-E-60	BNC-M-60	1524.0(60.0)

1ST END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated.

CABLE: Shielded mic. 4.95 mm (.195) O.D.
RG58C/U 4.95 mm (.195) O.D.
RG59B/U 6.15 mm (.242) O.D.
RG62A/U 6.15 mm (.242) O.D.

2ND END: Same as first end.
RATING: Operating Voltage: 500 VRMS Max.; +80°C. (+176°F.) Max.

TRIAXIAL CABLE ASSEMBLIES



MODEL 3581: 1ST END: Triaxial Male, 2 Lug. (Model 3600)
CABLE: Twinaxial, Belden 9272, 6.15 mm (.242) O.D., 78 Ohm impedance.
2ND END: Same as first end.
RATING: Operating Voltage: 500 VRMS Max.

MODEL	Length "L"
3581-CC-18	457.2(18.0)
3581-CC-24	609.6(24.0)
3581-CC-36	914.4(36.0)
3581-CC-48	1219.2(48.0)
3581-CC-60	1524.0(60.0)

MODEL 5223: 1ST END: Triaxial Male, 3 Lug. (Model 5218)
CABLE: Triaxial, Belden 9222, 6.15 mm (.242) O.D., 50 Ohm impedance.
2ND END: Same as first end.
RATING: Operating Voltage: 500 VRMS Max.

MODEL	Length
5223-36	914.4(36.0)
5223-60	1524.0(60.0)

MODEL 5054: 1ST END: Triaxial Male, 2 Lug. (Model 5056)
CABLE: Triaxial, Belden 9222, 6.15 mm (.242) O.D., 50 Ohm impedance.
2ND END: Same as first end.
RATING: Operating Voltage: 500 VRMS Max.

MODEL	Length
5054-36	914.4(36.0)
5054-60	1524.0(60.0)

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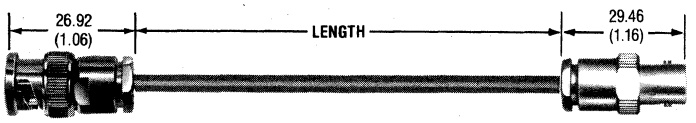
CABLE ASSEMBLIES

BNC MALE TO BNC FEMALE



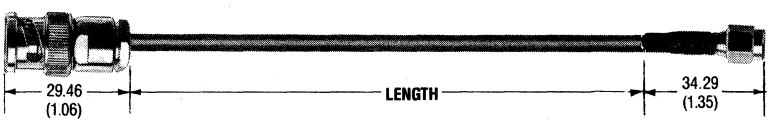
MODEL	Length
2223-C-12	304.8(12.0)
2223-C-24	609.6(24.0)
2223-C-36	914.4(36.0)
2223-C-48	1219.2(48.0)
2223-C-60	1524.0(60.0)

1ST END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms.

CABLE: RG58C/U 4.95 mm (.195) O.D.

2ND END: BNC Female. Brass body, tarnish resistant plated. Center contact, beryllium copper, gold plated. Impedance: 50 Ohms.
RATING: Operating Voltage: 500 VRMS Max.; +80°C. (+176°F.) Max.

BNC MALE TO SMA MALE



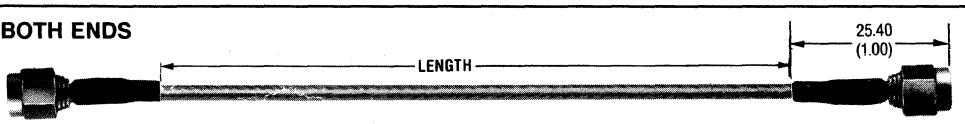
MODEL	Length
4935-BB-24	609.6 (24.0)
4935-BB-48	1219.2 (48.0)
4935-BB-60	1524.0 (60.0)

1ST END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms.

CABLE: RG316/U 2.49 mm (.098) O.D.

2ND END: Crimp SMA Male. Passivated steel shell. Gold plated center contact.
RATING: Operating Voltage: 335 VRMS Max.; +165°C. (+329°F.) Max.

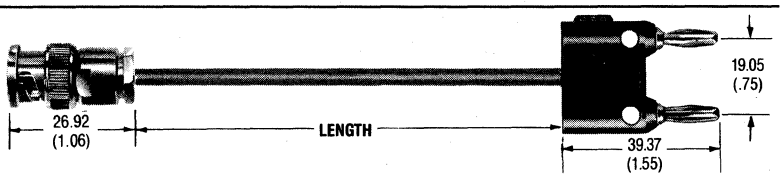
SMA MALE BOTH ENDS



MODEL RG174/U	MODEL RG316/U	MODEL RG142B/U	Length
4846-K-24	4846-BB-24	4846-X-24	609.6 (24.0)
4846-K-48	4846-BB-48	4846-X-48	1219.2 (48.0)
4846-K-60	4846-BB-60	4846-X-60	1524.0 (60.0)

1ST END: Crimp SMA Male. Passivated steel shell. Gold plated center contact. Meets conditions of MIL-C-39012. Impedance: 50 Ohms.
CABLE: RG 174/U 2.54 mm (.100) O.D. RG 316/U 2.49 mm (.098) O.D. or RG 142 B/U 4.95 mm (.195) O.D.
2ND END: Same as first end.

BNC MALE TO DOUBLE BANANA PLUG



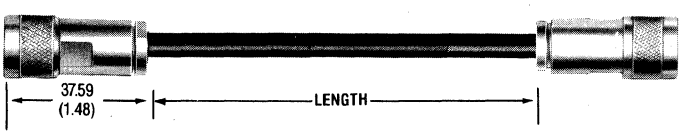
Shielded Mic. Cable	RG58C/U	Length
2BB-BNC-18	2BC-BNC-18	457.2(18.0)
2BB-BNC-24	2BC-BNC-24	609.6(24.0)
2BB-BNC-30	2BC-BNC-30	762.0(30.0)
2BB-BNC-36	2BC-BNC-36	914.4(36.0)
2BB-BNC-48	2BC-BNC-48	1219.2(48.0)
2BB-BNC-60	2BC-BNC-60	1524.0(60.0)

1ST END: BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms.

CABLE: RG58C/U 4.95 mm (.195) O.D.
Shielded mic. 4.95 mm (.195) O.D.

2ND END: Double Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation, polyethylene.
RATING: Operating Voltage: 500 VRMS Max.; +55°C. (+131°F.) Max.

TYPE "N" MALE EACH END



RG213/U	Length	RG214/U
1658-S-18	457.2(18.0)	1658-T-18
1658-S-24	609.6(24.0)	1658-T-24
1658-S-36	914.4(36.0)	1658-T-36
1658-S-48	1219.2(48.0)	1658-T-48
1658-S-60	1524.0(60.0)	1658-T-60

1ST END: Type "N" Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms.

CABLE: RG213/U 10.29 mm (.405) O.D. or RG214/U 10.80 mm (.425) O.D.

2ND END: Same as first end.
RATING: Operating Voltage: 1000 VRMS Max.; +80°C. (+176°F.) Max.

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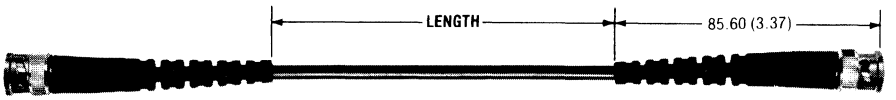
CABLE ASSEMBLIES

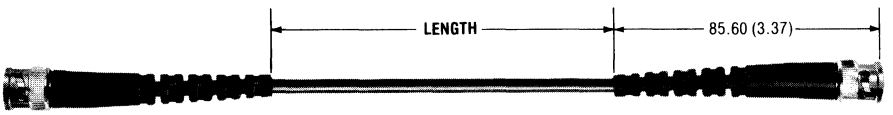
BNC MALE EACH END



RG58C/U 50 Ohm	RG59B/U 75 Ohm	RG174/U 50 Ohm	RG62A/U 93 Ohm	Length
2249-C-12	2249-E-12	2249-K-12	2249-M-12	304.8(12.0)
2249-C-24	2249-E-24	2249-K-24	2249-M-24	609.6(24.0)
2249-C-36	2249-E-36	2249-K-36	2249-M-36	914.4(36.0)
2249-C-48	2249-E-48	2249-K-48	2249-M-48	1219.2(48.0)
2249-C-60	2249-E-60	2249-K-60	2249-M-60	1524.0(60.0)
2249-C-72	2249-E-72			1828.8(72.0)
2249-C-120				3048.0(120.0)
2249-C-180				4572.0(180.0)

1ST END: Crimp BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms. Boot; PVC, black.
CABLE: RG58C/U 4.95 mm (.195) O.D.
RG59B/U 6.15 mm (.242) O.D.
RG62A/U 6.15 mm (.242) O.D.
RG174/U 2.54 mm (.100) O.D.
2ND END: Same as first end.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

LOW-NOISE BNC MALE EACH END



MODEL	Length
4964-SS-24	609.6 (24.0)
4964-SS-36	914.4(36.0)
4964-SS-48	1219.2(48.0)
4964-SS-60	1524.0(60.0)

1ST END: Crimp BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms. Boot; PVC, black.
CABLE: Belden 9223 or equivalent, 50 Ohm, 4.95 mm (.195) O.D.
2ND END: Same as first end.
RATING: Operating Voltage: 500 VRMS Max.; +50°C. (+122°F.) Max.

BNC MALE ON RETRACTILE (COILED) CORD

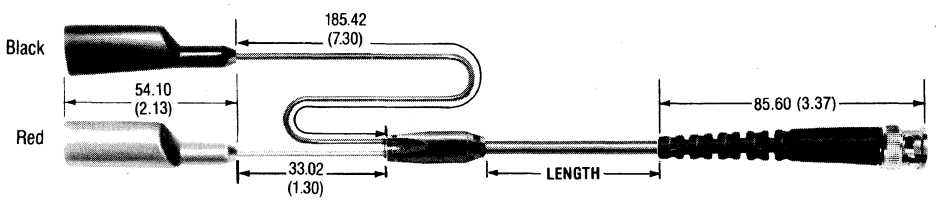
MODEL	Extended Length
4487-48	1219.2(48.0)
4487-60	1524.0(60.0)
4487-72	1829.0(72.0)

1ST END: Crimp BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms. Boot; PVC, black.

CABLE: Shielded microphone. Center conductor 24 AWG (45 x 40), polyurethane jacket 4.32 mm (.170) O.D.

2ND END: Same as first end.
RATING: 270 VDC-90 VAC cont. duty; +50°C. (+122°F.) Max.

ALLIGATOR CLIPS TO BNC MALE



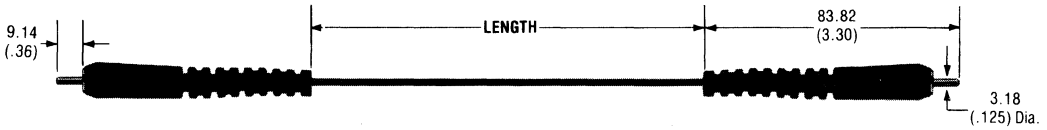
MODEL	Length
4531-C-18	457.2(18.0)
4531-C-24	609.6(24.0)
4531-C-30	762.0(30.0)
4531-C-36	914.4(36.0)
4531-C-48	1219.2(48.0)
4531-C-60	1524.0(60.0)

1ST END: Alligator Clips. Steel, nickel plated. Insulators; vinyl. One black and one red.

CABLE: RG58C/U 4.95 mm (.195) O.D. Y-mold insulation; PVC, black.

2ND END: Crimp BNC Male. Brass body, tarnish resistant plated. Center contact, brass, gold plated. Impedance: 50 Ohms. Boot; PVC, black.
RATING: Operating Voltage: 500 VRMS Max.; +50°C (+122°F.) Max.

PHONO PLUG BOTH ENDS



MODEL	Length
5092-K-18	457.2 (18.0)
5092-K-24	609.6 (24.0)
5092-K-36	914.4 (36.0)
5092-K-48	1219.2 (48.0)

1ST END: Phono plug. Brass, nickel plated. Boot; PVC, black.
CABLE: RG174/U, 2.54 mm (.100) O.D.

2ND END: Same as first end.
RATING: 500 VRMS; +50°C. (+122°F.) Max.

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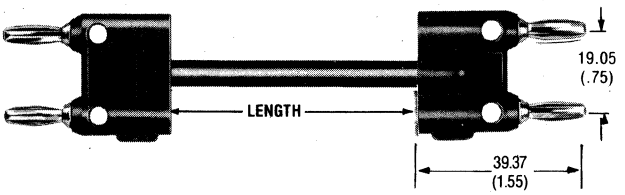
POMONA

CABLE ASSEMBLIES

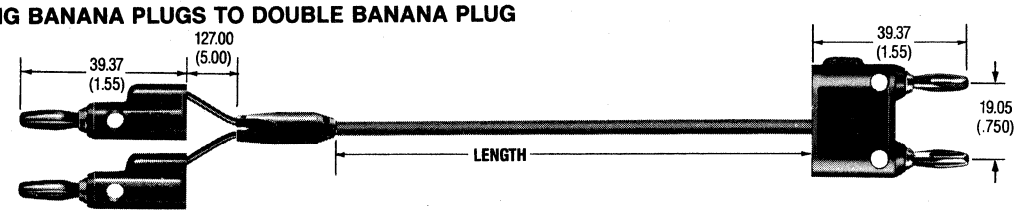
DOUBLE BANANA PLUG EACH END

1ST END: Double Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation, polyethylene.
CABLE: Two cond. twisted pair 6.35 mm (.250) O.D. rated at 300 VRMS.; Shielded mic. 4.95 mm (.195) O.D. rated at 1900 VRMS.; RG58C/U 4.95 mm (.195) O.D. rated at 1400 VRMS or RG59B/U 6.15 mm (.242) O.D. rated at 1700 VRMS.
2ND END: Same as first end.
RATING: +55°C. (+131°F.) Max.



Two Cond. Twisted Pr.	Shielded Mic. Cable	RG58C/U	RG59B/U	Length
2BA-18	2BB-18	2BC-18	2BE-18	457.2 (18.0)
2BA-24	2BB-24	2BC-24	2BE-24	609.6 (24.0)
2BA-36	2BB-36	2BC-36	2BE-36	914.4 (36.0)
2BA-48	2BB-48	2BC-48	2BE-48	1219.2 (48.0)
2BA-60	2BB-60	2BC-60	2BE-60	1524.0 (60.0)

STACKING BANANA PLUGS TO DOUBLE BANANA PLUG



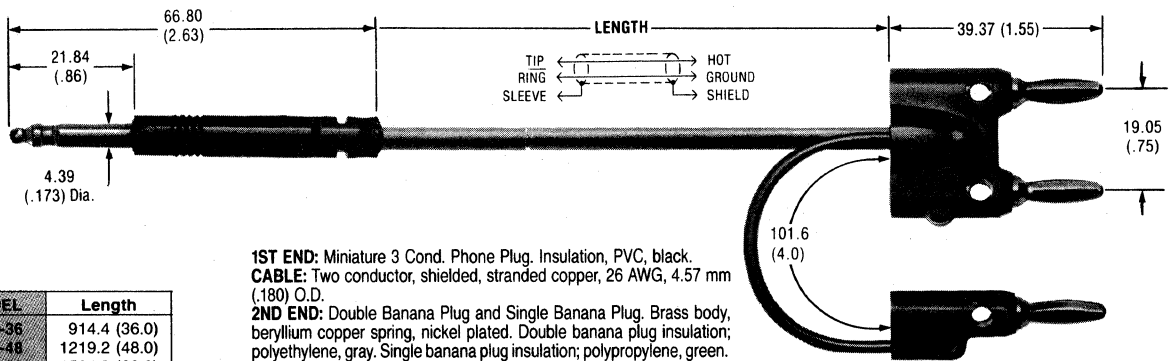
MODEL	Length
1368-A-18	457.2 (18.0)
1368-A-24	609.6 (24.0)
1368-A-30	762.0 (30.0)
1368-A-36	914.4 (36.0)
1368-A-48	1219.2 (48.0)
1368-A-60	1524.0 (60.0)

1ST END: Single Banana Plugs. Brass body, beryllium copper spring, nickel plated. Insulation, polypropylene. One black and one red.

CABLE: Two Cond., twisted pair, 6.35 mm (.250) O.D. Y-mold insulation; PVC, gray.

2ND END: Double Banana Plug. Brass body, beryllium copper spring, nickel plated. Insulation; polyethylene, gray.
RATING: 300 VRMS; +50°C. (+122°F.) Max.

BANTAM PLUG TO DOUBLE PLUG BALANCED LINE



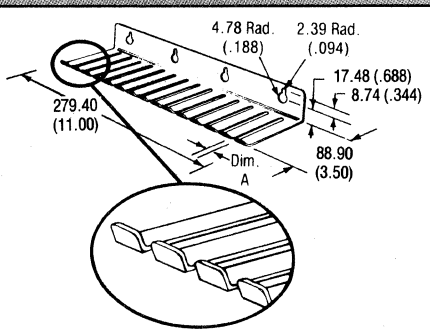
MODEL	Length
4281-36	914.4 (36.0)
4281-48	1219.2 (48.0)
4281-60	1524.0 (60.0)

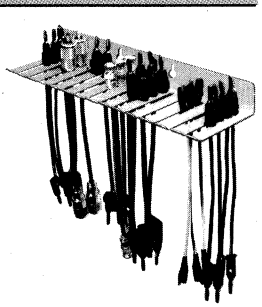
1ST END: Miniature 3 Cond. Phone Plug. Insulation, PVC, black.
CABLE: Two conductor, shielded, stranded copper, 26 AWG, 4.57 mm (.180) O.D.
2ND END: Double Banana Plug and Single Banana Plug. Brass body, beryllium copper spring, nickel plated. Double banana plug insulation; polyethylene, gray. Single banana plug insulation; polypropylene, green.
RATING: 500 V Peak; +55°C. (+131°F.) Max.

TEST LEAD HOLDER

TEST LEAD HOLDER

No need to spend time searching for a particular test lead. With these racks, all of your patch cords and cable assemblies can be conveniently filed for instant selection – within easy reach. Holder mounts quickly on any vertical surface. Test leads are easy to store, easy to remove. Three models to choose from for different size cables.
MATERIALS: Cold rolled steel.
FINISH: Baked enamel.





MODEL	Color	Max. Cable Dia. (Dim. A)
1508	Orange	5.33(.210)
4408	Black	8.13(.320)
2708	Blue	11.43(.450)

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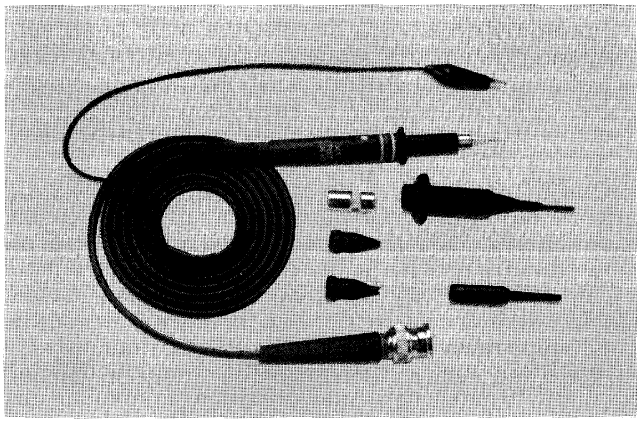
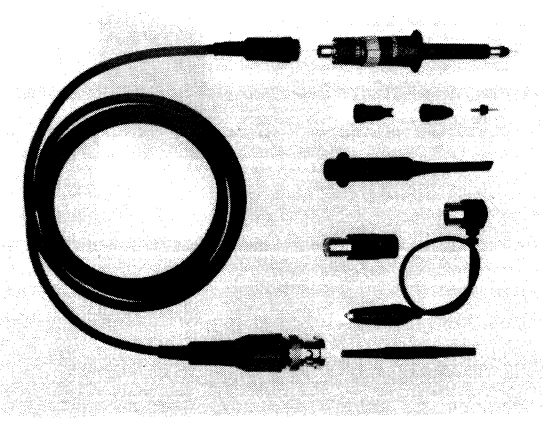
OSCILLOSCOPE PROBE KITS

SCOPE PROBES



MODEL 4550 Shown



MODEL 5587 Shown

Replacement probes for all oscilloscopes including Tektronix, HP, Phillips, B & K, and Leader. Standard probes provide low-cost, high quality signal reproduction. Modular probes assure the same high quality and have threaded connections for easy field repair.

STANDARD PROBES

FEATURES:

- Use with any scope
- Lower unit cost than modular
- X1, X10 attenuation and switchable X1, X10
- Bandwidths to 250 MHz
- Optional actuator pin for scopes with readout
- Gold plated probe tip on several models

MODEL	Style	Special Features	Bandwidth MHz at 3dB
5621	X1		20
5622	X10		100
4550	X1, X10 Switchable		100
5620	X10	Gold Plated	250
5618	X1, X10 Switchable		250
5619	X1, X10 Switchable	Gold Plated/ Readout Actuator	250

Contact factory to order replacement parts.

MODULAR PROBES

NEW

FEATURES:

- Use with any scope
- Inexpensive repair - cable, BNC and probe head screw together in seconds
- X1, X10 attenuation and switchable X1, X10
- Bandwidths to 250 MHz
- Optional actuator pin for scopes with readout

MODEL	Style	Special Features	Bandwidth MHz at 3dB
5586	X1		30
5587	X10		250
5588	X1, X10 Switchable		250
5590	X10	Readout Actuator	250

CUSTOM PRODUCTS:

ITT Pomona Electronics manufactures thousands of custom products each year to meet the particular needs of our customers. We have facilities to custom mold products with your logo. Even if it is brand new, we will be happy to quote to your design. Please contact our factory for quotations on custom products.

CATALOG:

Contact factory for a free current catalog displaying our full line of products.

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1500 East Ninth St. • P.O. Box 2767 • Pomona, Calif., 91769
Phone: (714) 623-3463 • TWX: 910-581-3822 • FAX: (714) 629-3317

Power Dynamics, Inc.

P.O. Box 539, 59 Lakeside Avenue, West Orange, NJ 07052 • (201) 736-5722 • FAX: (201) 736-8930 • Telex: 666173 (PDI)

IEC POWER RECEPTACLES/CONNECTORS

UL — United States
CSA — Canada
DEMKO — Denmark
NEMKO — Norway
SEMKO — Sweden
SEV — Switzerland
VDE — Germany

MATERIALS

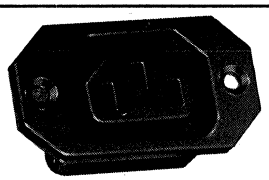
Housing Material: Polycarbonate Makrolon Type 60301
U/L-Pins: Nickel Plated Brass
Terminals: Electro Tin Plate over Copper Plate

Power Dynamics IEC Connectors have been submitted, tested and approved by most recognized National Testing Agencies. These prior approvals eliminate the necessity of a retesting program when submitted in equipment being evaluated by these same testing agencies.

Our IEC Connectors which conform to CEE-22 are accepted throughout the world for use in electrical equipment. Designers and manufacturers are offered maximum flexibility as PDI Connectors mate with all universally accepted CEE-22 Power Cords. PDI offers a complete selection of Power Cords. Equipment which incorporates PDI Connectors also offers the further advantage of shipping finished units with correct cord set, permitting immediate use without time consuming modifications on the part of the end customer.

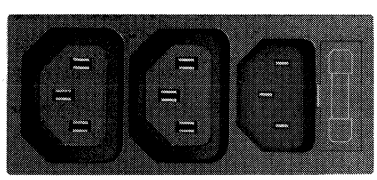
(42R01) (42R02) (42R03) UL VDE CSA SEV SEMKO NEMKO DEMKO

General purpose power cord connector. Screw, Quick Connect, or Solder Lug terminal configuration. Rated @ 10 amp., from 65°C to 155°C operating temperature. Designed for versatile mounting. Available in screw or snap-in panel mount and five mounting configurations.



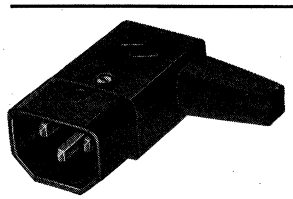
(43R02) (43R03) (43R04) UL VDE CSA

General purpose female power cord connector. Three terminal configurations: Screw, Quick Connect & Solder Lug. Rated 10 amp. 250V @ 65°C & 10 amp. 250V @ 120°C. Designed for versatile mounting. Screw or snap-in panel mount. Three mounting configurations.



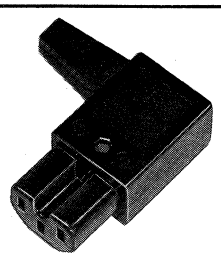
(COMBINATION) (44R01) UL CSA

Exceptionally versatile combination Fuse Connector. Combining our single male fuse connector 42R31, 32 33 with our female connector 43R02, 03, 04, allowing for a selection of 1 male outlet with from 1 to 6 female outlets. Rated 10 amp. Simple snap-in mounting.



(42R04) VDE

Male power cord plug with 10 amp. ratings. Contains integral cable clamp strain relief & internal screw type connections. Three mounting angle configurations.



(43R01) VDE SEV SEMKO NEMKO DEMKO

Female power cord plug with 10 amp. rating from 65°C to 155°C operating temperature. Integral cable clamp strain relief & internal screw type connection. Three mounting angle configurations.

Fuses are not included with unit

CONNECTORS AVAILABLE WITH QUICK CONNECT, SCREW & SOLDER TERMINALS

Mechanical Configurations Available in Combination with Any Electrical Configuration

CALL OR WRITE POWER DYNAMICS, INC. FOR COMPLETE ENGINEERING CATALOG • FSC60046

Power Dynamics, Inc.

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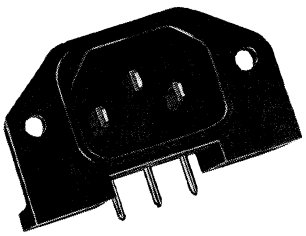
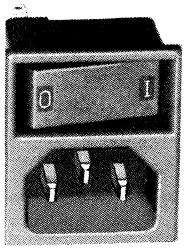
IEC POWER RECEPTACLES/CONNECTORS



(42R65)

UL
VDE
CSA
SEV
SEMKO
NEMKO
DEMKO

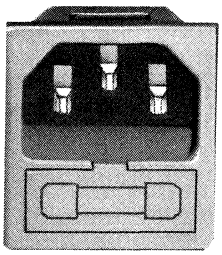
Combination Power Cord Connector with PRINTED CIRCUIT TERMINALS. Conforms with all international safety requirements. Rated 10 amp., 250V, 65°C to 120°C operating temperature. For automated assembly operations.



(42R36)

UL
VDE
CSA
SEV

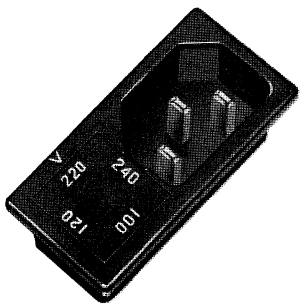
Combination power cord connector with single or double pole on/off snap action power switch. Conforms with all international product safety requirements. Designed to eliminate discrete purchase, inventory & assembly of connector & switch. Terminal connections are Solder or Quick Connect. Five terminal sizes. Rated 10 amp. single pole or double pole switch.



(42R35)

UL
VDE
CSA
SEV

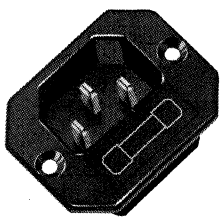
Combination single or double fuse holder power cord connector for domestic and international markets. Fuse holder is touch proof in accordance with international product safety requirements. Accepts either American or European fuse for maximum versatility in product applications. Fuse connections are externally accessible & isolated from power connections. Solder Lug & Quick Connect (terminal configurations) available in five terminal sizes. Rated 10 amp. with single or double fuse versions.



(42R34)
(42R38)

UL
VDE
CSA
SEV
SEMKO
NEMKO

Integral combination IEC power cord connector/ Fuse Holder/Voltage Selector. Meets all international safety requirements; may be used without modification at time of installation. Designed to switch voltages 100, 120, 240 by removing fuse cartridge & rotating to desired voltage, then snapping the cartridge back into connector housing. Fuse holder is touch proof in accordance with international product safety requirements. Series 42R34, page 20 accepts one international 5 x 20mm fuse. Series 42R38, accepts one standard 3 AG American type fuse. Rated @ 10 amp. from 65°C to 120°C operating temperature. Screw or Snap-in mount configurations.



(42R31)
(42R32)
(42R33)

UL
VDE
CSA
SEV
SEMKO
NEMKO

Combination single fuse holder/power cord connector of domestic & international markets. Fuse holder is touch proof in accordance with international product safety requirements. Accommodates one international 5 x 20mm fuse with space for a spare fuse. Terminal connections: Screw, Quick Connect or Solder Lug. Rated @ 10 amp., 65°C to 120°C operating temperature. Fuse connections are externally accessible and isolated from power connections. Screw or snap-in mount and five mounting configurations.

Fuses are not included with unit

CONNECTORS AVAILABLE WITH QUICK CONNECT, SCREW & SOLDER TERMINALS

Mechanical Configurations Available in Combination with Any Electrical Configuration

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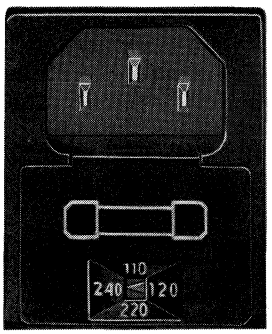
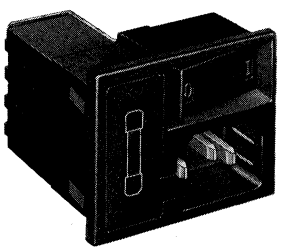
IEC POWER RECEPTACLES/CONNECTORS



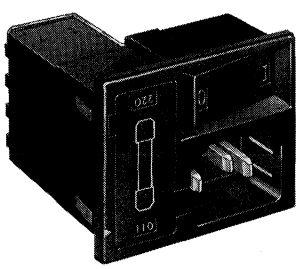
(42R40) UL CSA VDE

Integral combination IEC Connector, fuse holder & voltage selector. The voltage selector is designed to switch to four different voltages & provides a simple means to change transformer primary connections. Fuse Holder accepts either single or double IEC 5 x 20mm or U.S. ¼ x 1¼ fuses for maximum versatility in product applications. Fuse connections are externally accessible & isolated from power connections. Rated 10 amp. 250V @ 65°C & 10 amp. 250V @ 120°C. Connectors are available in Quick Connect or Solder terminals & three physical mounting configurations.



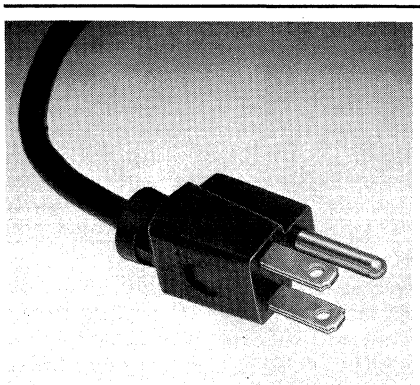
(42R37) UL VDE CSA SEV

Integral combination IEC power cord connector, fuse holder & on;off switch. Designed to eliminate, discrete purchase, inventory & assembly of individual components. Fuse holder accepts either single or double American or European fuses for maximum versatility (not interchangeable). Fuse connections are externally accessible & isolated from power connections. Rated 10 amp. 250V @ 65°C & 10 amp. 250V @ 120°C. Single or double pole snap action on/off switch. Terminal connections are Solder Lug or Quick Connect. Five terminal sizes. Meets all international safety requirements.



(42R39) UL VDE CSA SEV

Same features as 42R37 but with Voltage Selector. Changes voltages by rotating fuse cartridge. Meets all international safety requirements. Fuse Holder accepts American or 5 x 20mm European fuses.



POWER CORD SETS

UL	UTE	CEBEC
CSA	VDE	FEI
BSI	MQ	SEMKO
SECV	KEMA	SEV
OVE	NEMKO	

Approved by 14 international safety agencies. Compatible with all catalogued IEC Connectors.

See our complete line of American & International Power Cord Sets on page _____

Fuses are not included with unit

CONNECTORS AVAILABLE WITH QUICK CONNECT, SCREW & SOLDER TERMINALS

Mechanical Configurations Available in Combination with Any Electrical Configuration

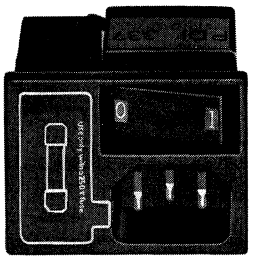
CALL OR WRITE POWER DYNAMICS, INC. FOR COMPLETE ENGINEERING CATALOG • FSC60046

Power Dynamics, Inc.

P.O. Box 539, 59 Lakeside Avenue, West Orange, NJ 07052 • (201) 736-5722 • FAX: (201) 736-8930 • Telex: 666173 (PDI)

RFI/EMI Filtered Power Entry Modules

HGN-337

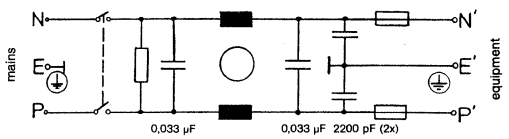


HGN-337 line filter modules feature a combination IEC Connector, two pole on/off switch and fuse holder that accepts both European 5 x 20mm or 3 AG fuses in-lin and neutral. The HGN-337 protects electronic equipment such as computers, terminals and typewriters from common mode and differential mode interferences.

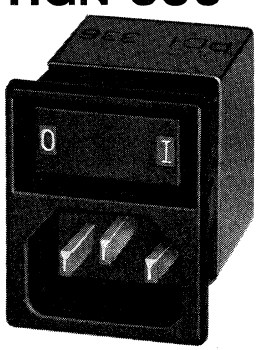
Technical data UL CSA VDE SEV

Operatingvoltage	250 V / 50 Hz 110 V / 60 Hz
Rated current	1 A / 2 A / 3 A / 4 A / 6 A
Leakage current	<0,5 mA / 250 VAC
Temperature range	−25° C — +85° C
Test voltage (VDE 0565)	1,8 kV / 50 Hz — 2 s

Circuit



HGN-336

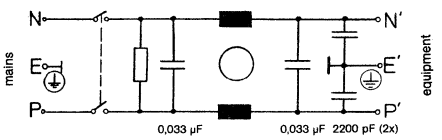


HGN-336 line filters feature an IEC Connector and a 2 pole on/off switch. The unit protects electronic equipment against malfunction due to fast common mode and differential mode interferences. Designed for labor saving snap-in mounting.

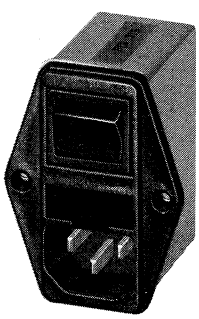
Technical data UL CSA VDE SEV

Operatingvoltage	250 V / 50 Hz 110 V / 60 Hz
Rated current	1 A / 2 A / 3 A / 4 A / 6 A
Leakage current	<0,5 mA / 250 VAC
Temperature range	−25° C — +85° C
Test voltage (VDE 0565)	1,8 kV / 50 Hz — 2 s

Circuit



HGN-375

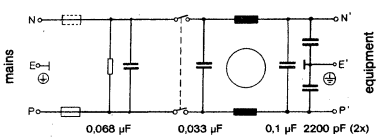


The comb-filter HGN-375 protects electronic equipment from common and differential mode line interference in the range of 10 KHz up to 30 MHz. The "combi-unit" is equipped with IEC Connector, fuse holder for one or two 5 x 20mm fuses, 2 pole on/off switch and fully enclosed metal housing.

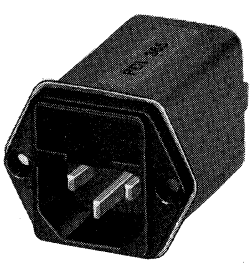
Technical data UL CSA VDE SEV

Operatingvoltage	250 V / 50 Hz 110 V / 60 Hz
Rated current	1 A / 2 A / 4 A
Leakage current	<0,5 mA / 250 VAC
Temperature range	−25° C — +85° C
Test voltage (VDE 0565)	1,8 kV / 50 Hz — 2 s

Circuit



HGN-365

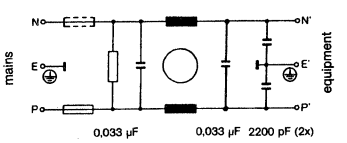


HGN-365 series line filters feature an IEC Connector with an integral fuse holder; available in versions with one or two 5 x 20mm fuses. (IEC601 prescribes fusing of both lines.)
Fully enclosed metal housing presents input of high frequency noise and protects ultra-sensitive equipment.

Technical data UL CSA VDE SEV

Operatingvoltage	250 V / 50 Hz 110 V / 60 Hz
Rated current	1 A / 2 A / 4 A
Leakage current	<0,5 mA / 250 VAC
Temperature range	−25° C — +85° C
Test voltage (VDE 0565)	1,8 kV / 50 Hz — 2 s

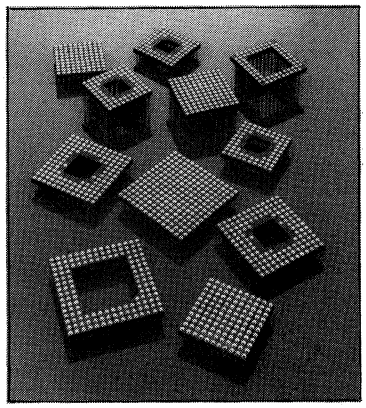
Circuit



Refer to our page in the Filter Section for additional Power Dynamics Filter Entry Modules.

Tomorrow's Products – Today

NEW

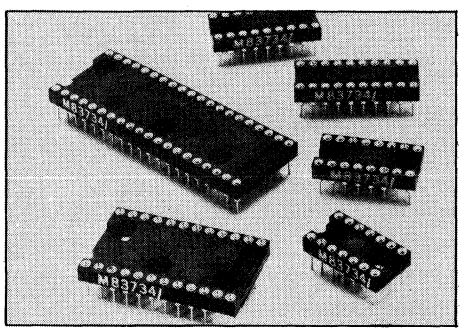


Molded Stand-Offs
Staggered Clips

NEW! MOLDED PIN GRID ARRAY SOCKETS
(Optional Staggered Clips & Molded Stand-Offs)

A very low insertion force four-finger contact allows for easy insertion and withdrawals. Optional staggered entry configurations reduce total package insertion forces to 1.75 oz. average* per pin. Molded stand-offs ensure reliable solder connection. Sockets are available for all popular devices. Call or write for samples—Today!

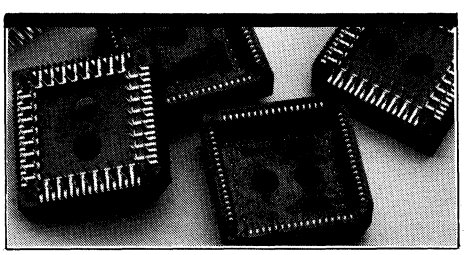
*Measured with a .018" dia. polished steel pin (average force per pin after measurement of total device insertion force).



MIL-S 83734 SCREW MACHINE SOCKETS

Precontact Series SOM socket assemblies meet new DESC specs for MIL-S-83734/1 thru /10 and MIL-S-83734/13 as follows:

010	Closed Frame	Wire-Wrap	Gold/Gold
011	Closed Frame	Wire-Wrap	Tin/Gold
012	Closed Frame	Wire-Wrap	Tin/Tin
028	Open Frame	Solder Tail	Gold/Gold
029	Open Frame	Solder Tail	Tin/Gold
030	Open Frame	Solder Tail	Tin/Tin
031	Closed Frame	Solder Tail	Gold/Gold
032	Closed Frame	Solder Tail	Tin/Gold
033	Closed Frame	Solder Tail	Tin/Tin



JEDEC-QUALIFIED
FOR TYPE "A" 68 and 84 PIN PACKAGES

PLASTIC LEADED CHIP CARRIER SOCKETS (PLCC)

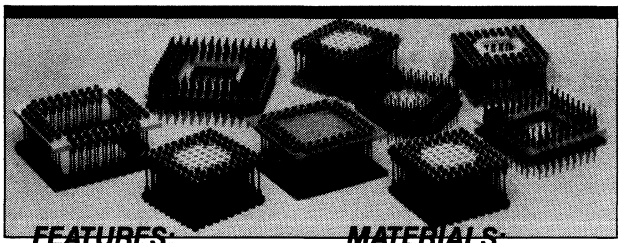
New Precontact 68 and 84 contact PLCC socket are JEDEC-qualified for type "A" J-leaded devices. Preloaded, stamped and formed contacts on .050" centers provides excellent stabilization. Compact, low-profile design. Perforated construction for easy cleaning. Can be test-probed after mounting. Accommodates an anti-shock retention clip. Copper alloy contacts with tin-lead plating and UL 94V-0 glass-filled insulator. Call today to place an order or request application assistance!

Precontact, inc.

835 Wheeler Way, P.O. Box 798, Langhorne, PA 19047 (215) 757-1202 Telex: 83-4253 Fax: (215) 757-8025

Precicontact, inc. Tomorrow's Products – Today

PIN GRID ARRAY SOCKETS

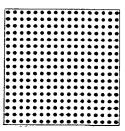


FEATURES:

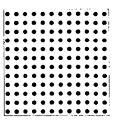
- Select from a large variety of configurations.
- Solder or wire-wrap tail styles.
- Tapered entry design of contact assembly insures low component insertion and withdrawal forces.
- Open and closed frame designs. 2.5 oz. insertion forces.
- Special grid designs upon request.

MATERIALS:

- Insulator—Glass epoxy .062" thick, UL-Rated 94V-0.
- Machined socket terminals—See General Notes*



X-1717-289
289 PIN
1.700 SQ.



X-1212-144
144 PIN
1.300 SQ.

We can socket your ASIC designs

SIZES AVAILABLE

5 x 5	11 x 11	15 x 15
8 x 8	12 x 12	16 x 16
9 x 9	13 x 13	17 x 17
10 x 10	14 x 14	18 x 18

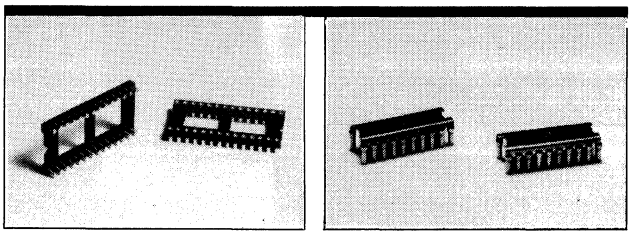
X-0505-012
12 PIN
500 SQ.

OVER 80 DESIGNS FROM 12 TO 400 PINS.

SURFACE MOUNTABLE SOCKETS

SERIES ULI

SERIES CNT



FEATURES:

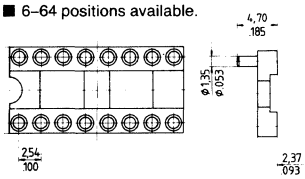
Series CNT–
- Suitable for surface mounting.
- Brass carrier, 6–40 positions.
- Direct visibility for soldering, inspection and repair.
- Allows maximum air circulation under IC's.

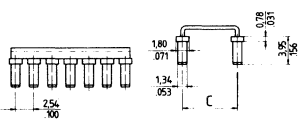
Series ULI–
- Suitable for surface mounting.
- Stackable end-to-end, side-to-side.
- Contact features closed end construction, eliminating any solder or flux wicking problems.
- Machined outer sleeve with precision inner contact, plated all over.
- 6–64 positions available.

MATERIALS:

Series CNT–
- Carrier–brass.
- Machined socket terminals–see general notes*

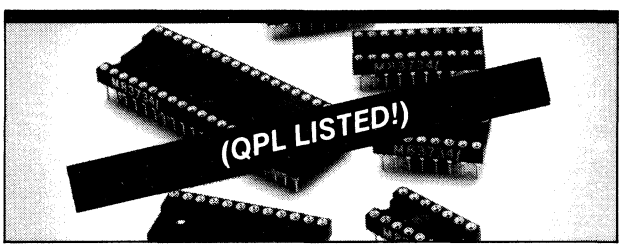
Series ULI–
- Insulator–glass filled PBTP, UL-rated 94V-0.
- Machined socket terminals–see general notes*





Consult Precicontact I.C. Socket Catalog for positions and part numbers available.

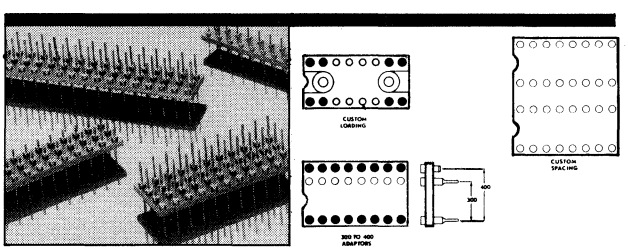
SERIES SOM MIL-S-83734 SOCKETS



CROSS-REFERENCE LIST OF DESC-APPROVED SOCKETS

MILITARY P/N	PRECICONTACT P/N
M83734/1-010	WWM306GH353
-011	WWM306TL353
-012	WWM306TL354
-028	USOM306GHA53
-029	USOM306TLA53
-030	USOM306TLA54
-031	SOM306GHA53
-032	SOM306TLA53
-033	SOM306TLA54
M83734/2-010	WWM308GH353
-011	WWM308TL353
-012	WWM308TL354
-028	USOM308GHA53
-029	USOM308TLA53
-030	USOM308TLA54
-031	SOM308GHA53
-032	SOM308TLA53
-033	SOM308TLA54
M83734/3-010	WWM314GH353
-011	WWM314TL353
-012	WWM314TL354
-028	USOM314GHA53
-029	USOM314TLA53
-030	USOM314TLA54
-031	SOM314GHA53
-032	SOM314TLA53
-033	SOM314TLA54
M83734/4-010	WWM316GH353
-011	WWM316TL353
-012	WWM316TL354
-028	USOM316GHA53
-029	USOM316TLA53
-030	USOM316TLA54
-031	SOM316GHA53
-032	SOM316TLA53
-033	SOM316TLA54
M83734/5-010	WWM318GH353
-011	WWM318TL353
-012	WWM318TL354
-028	USOM318GHA53
-029	USOM318TLA53
-030	USOM318TLA54
-031	SOM318GHA53
-032	SOM318TLA53
-033	SOM318TLA54
M83734/6-010	WWM442GH353
-011	WWM422TL353
-012	WWM422TL354
-028	USOM422GHA53
-029	USOM422TLA53
-030	USOM422TLA54
-031	SOM422GHA53
-032	SOM422TLA53
-033	SOM422TLA54
M83734/7-010	WWM628GH353
-011	WWM628TL353
-012	WWM628TL354
-028	USOM628GHA53
-029	USOM628TLA53
-030	USOM628TLA54
-031	SOM628GHA53
-032	SOM628TLA53
-033	SOM628TLA54
M83734/8-010	WWM624GH353
-011	WWM624TL353
-012	WWM624TL354
-028	USOM624GHA53
-029	USOM624TLA53
-030	USOM624TLA54
-031	SOM624GHA53
-032	SOM624TLA53
-033	SOM624TLA54
M83734/9-010	WWM636GH353
-011	WWM636TL353
-012	WWM636TL354
-031	SOM636GHA53
-032	SOM636TLA53
-033	SOM636TLA54
M83734/10-010	WWM640GH353
-011	WWM640TL353
-012	WWM640TL354
-028	USOM640GHA53
-029	USOM640TLA53
-030	USOM640TLA54
-031	SOM640GHA53
-032	SOM640TLA53
-033	SOM640TLA54
M83734/13-010	WWM320GH353
-011	WWM320TL353
-012	WWM320TL354
-028	USOM320GHA53
-029	USOM320TLA53
-030	USOM320TLA54
-031	SOM320GHA53
-032	SOM320TLA53
-033	SOM320TLA54

CUSTOM SOCKETS



Our custom capability is as diverse as your requirements. We design to your specs efficiently and economically. Prototypes and samples are available. Please contact the factory with specific details.

Other Precicontact products include:

SERIES CSO—Socket Terminal Carrier Assemblies
Easy group insertion. Matched socket terminals.

SERIES USCAC/UWCAC—Hush Socket™
Decoupling capacitor sockets. Free-standing spring contacts. Solder or wire-wrap tails. Machined socket terminals.

SERIES LSI—Adaptor Sockets
For dual-in-line and quad-in-line circuits. Up to 64 pins on 600" or 900" spacing.

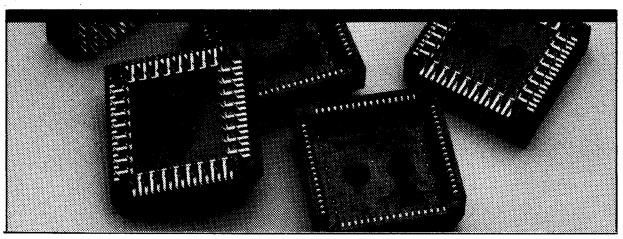
MIL-C-39029 Pin & Socket Contacts
Screw machined MIL-C-39029/56 & 63 sockets and MIL-C-39029/58 & 64 pins have QPL approval.

GENERAL NOTES ABOUT PRECICONTACT SOCKETS
Low profile Precicontact sockets are designed to meet MIL-S-83734. All socket assembles (except Series LTO) feature four-leaf inner contact springs assembled into closed-entry, machined sockets that accept short IC leads. Inner contacts are BeCu, gold-over-nickel per MIL-S-45204, outer sleeves are brass, gold-over-nickel, or tin-plated. Standard insulator material is thermoplastic polyester, UL-rated 94V-0, except where noted. Contact design eliminates solder or flux wicking problems.

PRECICONTACT, INC., 835 WHEELER WAY, P.O. BOX 798, LANGHORNE, PA 19047. 215-757-1202. TELEX: 83-4253. FAX: 215-757-8025.

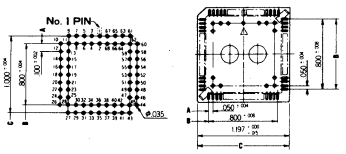
Precicontact, inc. Tomorrow's Products—Today

PLASTIC LEADED CHIP CARRIER SOCKETS(PLCC)
JEDEC-qualified 68 & 84 pins



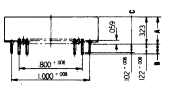
FEATURES:
- JEDEC-qualified for standard leaded chip carrier type "A".
- Compact, low-profile design.
- Perforated construction for easy cleaning.
- Permit test probing after mounting.
- Mountable anti-shock/anti-vibration retention clip.
- Preloaded stamped and formed contacts.

MATERIALS:
- Insulator—See General Notes*.
- Contacts: Stamped and formed copper alloy with tin-lead plating.



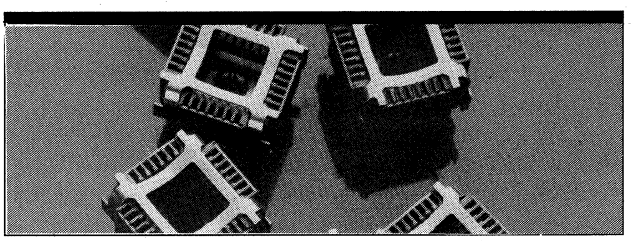
DIMENSIONS

	A	B	C
Socket Pattern	.250	.800	1.20
PC-board Pattern	.100	.800	1.00
Profile	.323	.122	.102



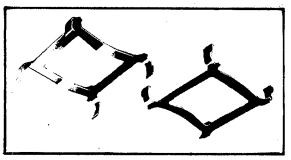
All dimensions in inches.

LEADLESS CHIP CARRIER
(LCC)



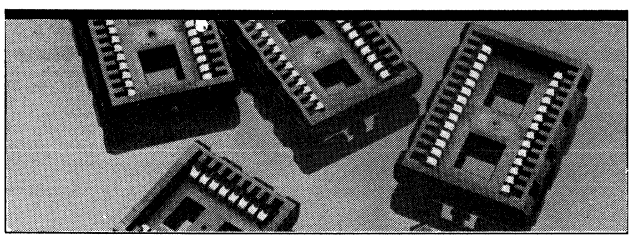
FEATURES:
- Precicontact is introducing sockets for ceramic leadless chip carrier conform to JEDEC standard A, B, C, and D types from 28 to 84 contacts.
- The sockets are designed for use in industrial, telecommunication and military applications.
- 6 sizes: 28, 44, 52, 68, 84 contacts variants.
- 2 types of polarization:
  A for ceramic leadless chip carrier A, B and D
  C for ceramic leadless chip carrier C
- 2 terminations: dip solder surface mount

MATERIALS:
- Material: glass filled thermoplastic
- Contacts: copper alloy with gold on contact area

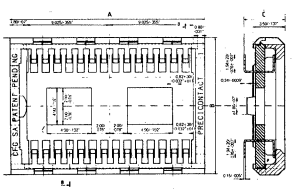


The choice of a spring latch is determined by the thickness, the size of the ceramic leadless chip carrier and whether the chip is single or double sided.

SURFACE MOUNT SOCKETS
SERIES SMS

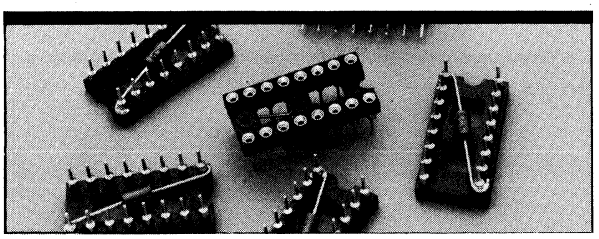


FEATURES:
PRECICONTACT's SMS line of sockets offers the designer a large array of benefits, to name but a few:
- Low insertion force.
- 70 gr (2.47 oz) contact force when IC is in place.
- Same footprint as integrated circuits.
- Same substrate can be used with or without socket.
- Can be glued for double side printed circuit board population.
- High temperature resistant plastic compatible with SMD soldering techniques such as heated surface reflow, infra red, vapor phase and wave soldering.
- Designed to allow for the mounting of SMD components under the socket.
- Compatible with pick & place machines.
- Available on standard 330mm (12.99 inch) reels.
- Designed according to IEC SO (small outline) packaging standards.
- Available in eight sizes from 8 to 28 pins.
- Available as standard, to meet European or Japanese specification.



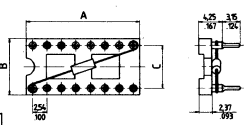
Part Number	A	B	C	D
SMS108TL	.330	.370	.170	.101
SMS114TL	.480	.370	.170	.101
SMS116TL	.530	.370	.170	.101
SMS216TL	.530	.590	.170	.288
SMS218TL	.580	.590	.170	.288
SMS220TL	.630	.590	.170	.288
SMS224TL	.730	.590	.170	.288
SMS228TL	.830	.590	.170	.288

DECOUPLING CAPACITOR SOCKETS
SERIES UCO



FEATURES:
- High reliability at low cost.
- Available in .018 dia. solder tail in variety of lengths or in .025 square tail in 3, 2, or 1-level of wrap.
- Operating temperature –54°C to 150°C.

MATERIALS:
- Insulator—See General Notes*.
- Machined socket terminals: See General Notes*.



Standard parts

Part number Numéro de pièce	No. of pins Nb. de contacts	Dimension A	Dimension B	Dimension C
UCOCAPA308ILA31	8	10.16/400	10.16/400	7.62/300
UCOCAPA314ILA31	14	17.78/700		
UCOCAPA315ILA31	16	20.32/800		
UCOCAPA318ILA31	18	22.86/900		
UCOCAPA320ILA31	20	25.40/1000		
UCOCAPA422ILA31	22	27.94/1000	12.70/500	10.16/400
UCOCAPA324ILA31	24	30.48/1200	10.16/400	7.62/300
UCOCAPA624ILA31	24	30.48/1200	17.78/700	15.24/600
UCOCAPA628ILA31	28	35.56/1400		
UCOCAPA460ILA31	40	50.80/2000		

Dimensions mm/inch

OPTIONS

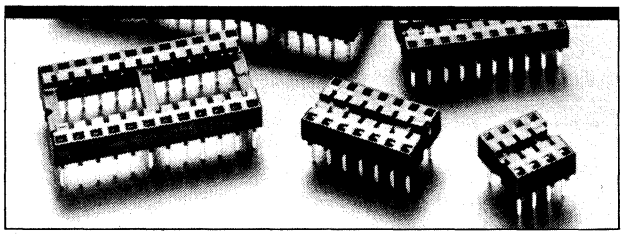
Capa	µF	Volts
0010	0.010	50 VDC
0015	0.015	50 VDC
0022	0.022	50 VDC
0047	0.047	50 VDC
0100	0.100	50 VDC

GENERAL NOTES ABOUT PRECICONTACT SOCKETS
Low profile Precicontact sockets are designed to meet MIL-S-83734. All socket assembles (except Series LTO) feature four-leaf inner contact springs assembled into closed-entry, machined sockets that accept short IC leads. Inner contacts are BeCu, gold-over-nickel per MIL-S-45204, outer sleeves are brass, gold-over-nickel, or tin-plated. Standard insulator material is thermoplastic polyester, UL-rated 94V-0, except where noted. Contact design eliminates solder or flux wicking problems.

PRECICONTACT, INC., 835 WHEELER WAY, P.O. BOX 798, LANGHORNE, PA 19047. 215-757-1202. TELEX: 83-4253. FAX: 215-757-8025.

Precicontact, inc. Tomorrow's Products—Today

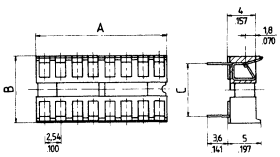
STAMPED AND FORMED CONTACTS
Dual Wipe–SERIES LTO



FEATURES:
- 8 thru 40 positions.
- Stackable end-to-end and side-to-side for high board density.
- Tapered lead-in ramps.
- Very low cost.
- Housing standoffs help cooling, cleaning and soldering.

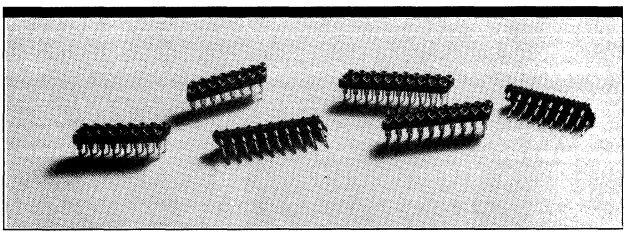
MATERIALS:
- Insulator—See General Notes*.
- Contacts: (Dual Wipe) Phos. bronze, tin-lead plating.

SERIES LTO
Dual Wipe Dip Sockets



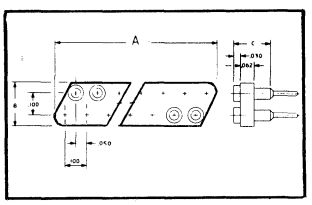
Part Number	No. Pins	A	B	C
LTO308TBB	8	.400	.400	.300
LTO314TBB	14	.700	.400	.300
LTO316TBB	16	.800	.400	.300
LTO318TBB	18	.900	.400	.300
LTO320TBB	20	1.000	.400	.300
LTO624TBB	24	1.200	.700	.600
LTO628TBB	28	1.400	.700	.600
LTO640TBB	40	2.000	.700	.600

ZIP SOCKETS
for DRAM Applications



FEATURES:
- 14, 16, 18, 20, 24 28, 40 and 60 positions.
- High-reliability screw-machine design.
- Solder tail configurations have mounted heights of .098″ to .165″ above board.
- Also available in wire-wrap. Protects IC's from flux contamination and soldering or cleaning damage. Stackable design.
- Quick and easy removal or replacement.

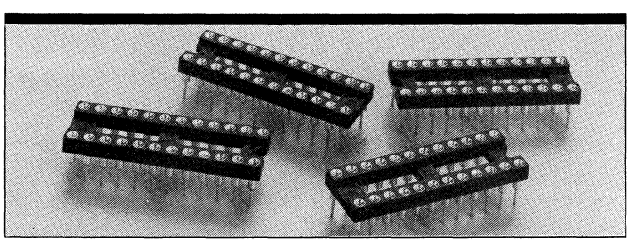
MATERIALS:
- Insulator—Glass epoxy G-10.
- Machined socket terminal —See General Notes*.



Standard Parts

Part number	No. of pins	Dimension A	Dimension B	Dimension C
ZIP014TLA31	14	.746	.197	.165
ZIP016TLA31	16	.846	.197	.165
ZIP018TLA31	18	.946	.197	.165
ZIP020TLA31	20	1.046	.197	.165
ZIP024TLA31	24	1.246	.197	.165
ZIP028TLA31	28	1.446	.197	.165
ZIP040TLA31	40	2.146	.197	.167
ZIP060TLA31	60	3.146	.197	.167

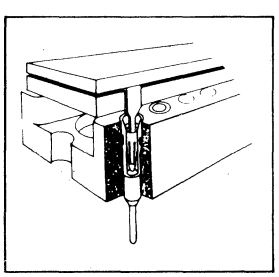
DIP SOCKETS
Solder tail & wire wrap



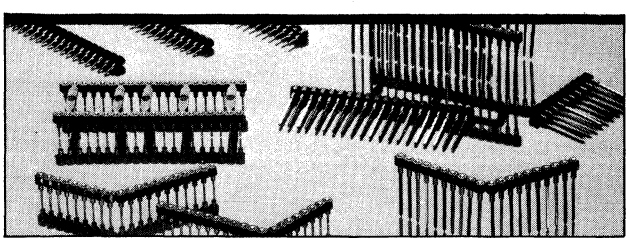
FEATURES:
- High-reliability at low cost.
- Available in .018 dia. solder tail variety of lengths or in .025 square tail in 3, 2, or 1-level of wrap.
- Operating temperature – 54°C to 150°C.

Series SO/WW (DIP)
Accommodates 6 thru 40 flat lead DIP IC's or 0,41/.016 to 0,51/.021 dia. round leads.
Series USO/UWW (DIP)
Accommodates 6 thru 64 flat lead DIP IC's or 0,41/.016 to 0,51/.021 dia. round leads.

MATERIALS:
- Insultator—See General Notes*.
- Machined socket terminals: See General Notes.*



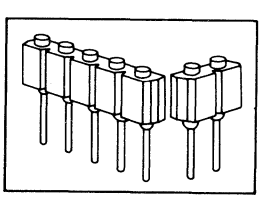
SIP SOCKETS
Solder tail & wire wrap



FEATURES:
- High-reliability at low cost.
- Available in .018 dia. solder tail in variety of lengths or in 0.25 square tail in 3, 2, or 1-level of wrap.
- Operating temperature – 54°C to 150°C.

Series SSO/SWW (SIP)
Snap-a-Part
Single-in-line 32 pins, .100″ spacing. Accepts probes of .016″ thru .022″.
Create your own part on any centers. Install end-to-end or side-by-side.

MATERIALS:
- Insulator—See General Notes*.
- Machined socket terminals: See General Notes*.



**GENERAL NOTES ABOUT PRECICONTACT SOCKETS*
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PRECICONTACT, INC., 835 WHEELER WAY, P.O. BOX 798, LANGHORNE, PA 19047. 215-757-1202. TELEX: 83-4253. FAX: 215-757-8025.

Preh Electronic Industries, Inc.
470 East Main Street, Lake Zurich, IL 60047-2578 U.S.A.
Phone (312) 438-4000 • Telex 297-112 PEI UR • FAX 312-438-5522

DIN CIRCULAR CONNECTORS

Preh circular DIN connectors are rugged, miniaturized connectors designed to provide reliable interconnections to peripheral equipment, test and measurement instrumentation, medical equipment, control devices, etc. Originally designed for audio applications they range from 3 to 8 contacts per connector at operating power up to 3A/34V. Preh connectors are available in nickel plated die cast zinc alloy bodies for applications requiring durability and also in plastic bodies where durability is not a problem. Insert material is molded phenolic. Female "tuning fork" type contacts are silver plated while male pins are tinned. Connectors and contacts can be custom plated to customer specification.

PLUGS

CORD PLUG Extended Barrel Series 71408
For cable-to-cable or cable-to-panel applications not requiring "locking" type connection.

CORD PLUG Locking Series 71430
Cable-to-cable or cable-to-panel termination with 30° locking ring. Heavy duty cable clamp with flexible black cable sleeve.

CORD PLUG Cable & Sleeve Series 76597
Economical connector for applications not requiring the metal bodies. Standard color is gray with gray cable sleeve.

CORD PLUG Plastic Shell No Sleeve Series 71414
Useful in limited access applications. Standard color is gray with gray cable sleeve.

RIGHT ANGLE 8 Position Barrel Series 71432
Right angle configuration for limited space applications. Barrel can be set for 8 cable approach angles.

RIGHT ANGLE 8 Position Barrel Locking Series 71434
Right angle design 8 position barrel and locking ring. Polarized body and grounding contact insure proper connection.

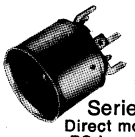
RECEPTACLES

CORD RECEPTACLE Series 71502
For normal cable-to-cable or cable-panel applications. Nickel plated, die cast metal shell with flexible black cable sleeve.

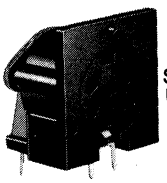
CORD RECEPTACLE Locking Series 71506
Mates with males equipped with 30° locking rings. Die cast body with nickel plated finish

PANEL MOUNT Series 71200
Receptacle designed to mate with males having shielded or extended bodies. Drawn metal recessed shell includes grounding contact.

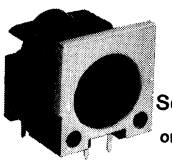
PANEL MOUNT Locking Series 71206
Extended die cast shell has locking flange for males with 30° locking rings. Automatic grounding protects equipment.



BOARD MOUNT Series 71204
Direct mounting to PC boards. Drawn metal shell automatically grounds to protect equipment.



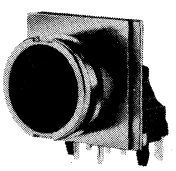
BOARD MOUNT Series 71222
Mounts directly to PC board, mating plugs connect at 90° to board surface. Black plastic body with grounding contact.



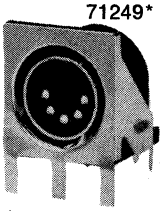
BOARD MOUNT EMI/RFI Shielded Series 71222
Metal flange on face is used as a common ground between mated connectors to board and chassis. Provides 360° shielding.

PANEL MOUNT Disconnect Contact Series 71210
Shell carries an insulated "disconnect" contact that is activated by the mating plug.

Series 71251*



Series 71249*



PIN AND CONTACT CONFIGURATIONS

NEW IN 1989:
MOLDABLE PLUGS AND MINI-DIN

PLUGS — RECEPTACLES

PIN ARRANGEMENT	Straight Cord Series 71408	Straight Cord Locking Series 71430	Straight Cord Plastic Shell Series 76597	Cord Plug Plastic Shell Series 71414	Right Angle Series 71432	Right Angle Locking Series 71434	Right Angle PC Mount Shielded	Right Angle PC Mount Locking
A - 3 Pins at 180°	71408-030	71430-030	76597-630	71414-030	71432-030	71434-030	71249-034	71251-030
B - 4 Pins at 210°	71408-040	71430-040	76597-640	71414-040	71432-040	71434-040	—	71251-040
C - 5 Pins at 240°	71408-250	71430-250	76597-652	71414-250	71432-250	71434-250	—	71251-250
D - 5 Pins at 180°	71408-153	71430-050	76597-650	71414-050	71432-050	71434-050	71249-054	71251-050
E - 6 Pins at 240°	71408-060	71430-060	76597-660	71414-060	71432-060	—	—	71251-060
F - 7 Pins at 270°	71408-070	71430-070	76597-670	—	71432-070	—	71249-074	71251-070
G - 8 Pins at 270°	71408-080	71430-080	76597-680	—	71432-080	—	—	71251-080

RECEPTACLES

PIN ARRANGEMENT	Straight Cord Series 71502	Straight Cord Locking Series 71506	Panel Mt. Recessed Series 71200	Panel Mt. Locking Series 71206	PC Mt. Series 71204	90° PC Mt. Series 71222	90° PC— Shielded Series 71222	Disconnect Series 71210
A - 3 Pins at 180°	71502-030	71506-030	71200-030	71206-030	71204-030	71222-030	71222-034	71210-030
B - 4 Pins at 210°	71502-040	71506-040	71200-040	71206-040	71204-040	71222-040	71222-041	71210-040
C - 5 Pins at 240°	71502-250	71506-250	71200-150	71206-050	71204-051	71222-059	71222-153	71210-050
D - 5 Pins at 180°	71502-050	71506-050	71200-050	71206-051	71204-065	71222-054	71222-152	—
E - 6 Pins at 240°	71502-060	—	71200-060	—	71204-060	71222-061	71222-064	—
F - 7 Pins at 270°	71502-070	71506-070	71200-070	71206-070	71204-070	71222-070	71222-071	71210-070
G - 8 Pins at 270°	71502-080	71506-080	71200-080	71206-080	71204-080	71222-081	71222-084	—

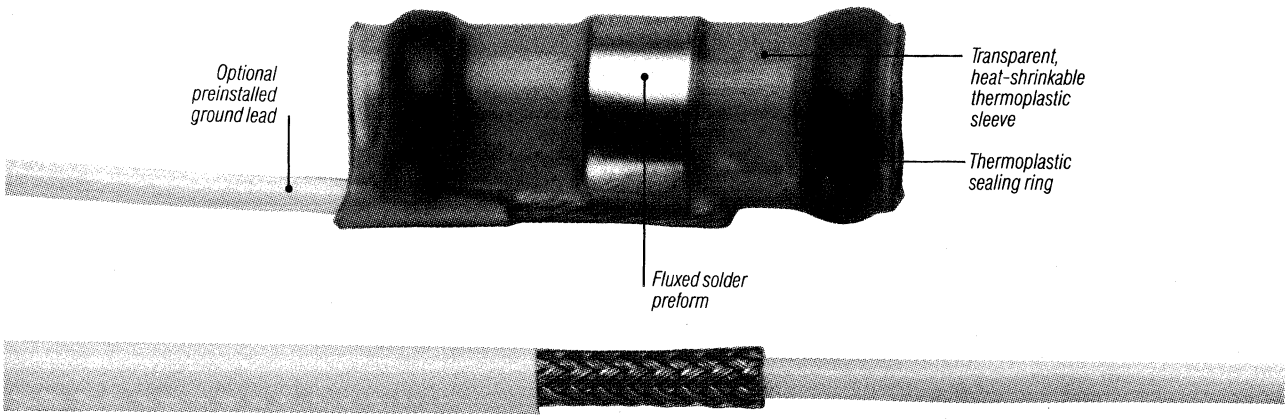
* NOTE: 030 & 034 are 3 Pin, 050 & 054 are 5 Pin, 070 & 074 are 7 Pin.

PEI is a wholly owned subsidiary of Preh Elektrofeinmechanische Werke, Bad Neustadt a/d Saale, West Germany with offices and plants in Germany, Austria, Portugal, and Singapore.

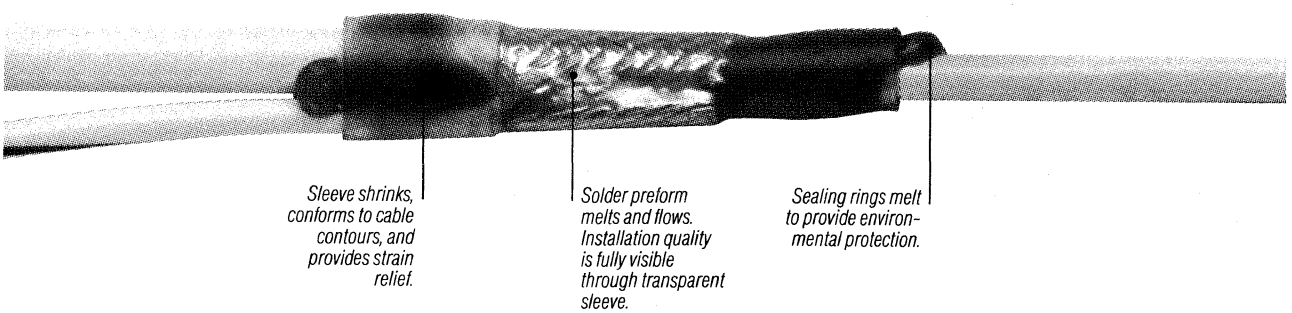
***DETAILED CATALOG AVAILABLE UPON REQUEST**

INSTANT RELIABILITY.

Typical SolderSleeve® Shield Terminator
(enlarged over four times)



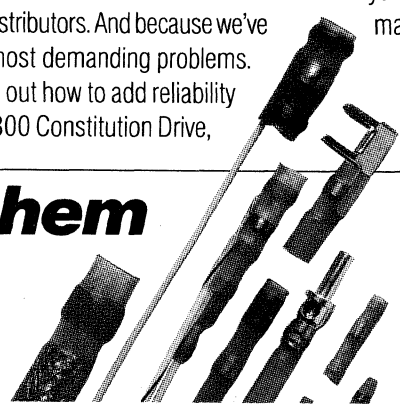
JUST ADD HEAT.



There's no interconnect or termination a Raychem SolderSleeve® device can't instantly improve. Because a SolderSleeve device instantly adds reliability. What makes it possible is controlled soldering, sealing and strain relief. Plus unique design. Solder, sealant and tubing come as one piece, so installation is simple and fast. Just slip on a SolderSleeve device and heat.

We have hundreds to choose from so there are hundreds of ways to improve the reliability of your products. All of them available through the world's best distributors. And because we've made SolderSleeve devices for over 25 years, we have plenty of experience solving the most demanding problems. Call 415) 361-3860 for our free brochure and distributor location nearest you. And find out how to add reliability just by adding heat.

Raychem Corporation, 300 Constitution Drive, Menlo Park, CA 94025-1164.



Raychem ***SolderSleeve® Terminators***

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COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

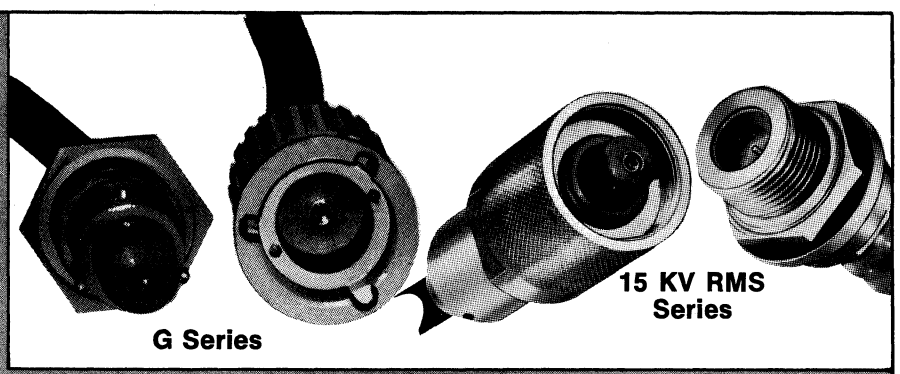
W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

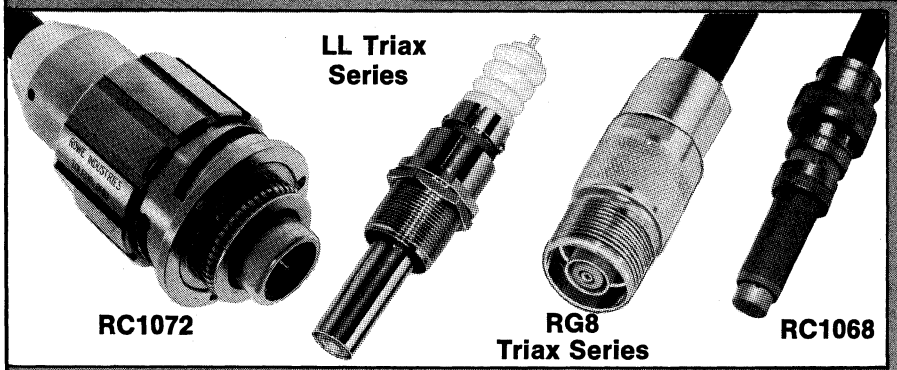
Rowe Coaxial Connectors and Cable Assemblies

Employ high-voltage, corona-free design techniques. They are ideal for use in pulse as well as DC voltage applications, through 150 KV. A wide variety of molded-on or field assembly types are offered. Available in quick disconnect or screw couplings.



G Series

15 KV RMS Series



LL Triax Series

RC1072

RG8 Triax Series

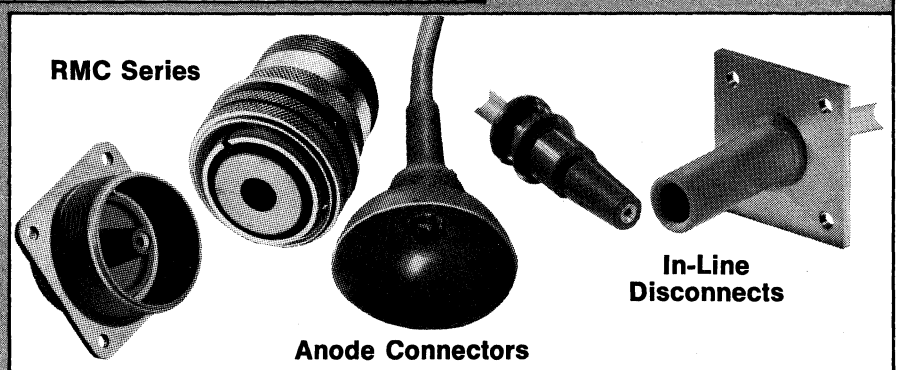
RC1068

Rowe Triaxial Connectors and Cable Assemblies

A full spectrum of both molded-on and field assembly types are available for a wide variety of cable types such as the triaxial version of RG-8, up through and including specialized construction for operation in excess of 100 KV.

Rowe Single Contact Connectors and Cable Assemblies

Offered is an extensive listing of single contact high-voltage assemblies, which include anode connectors, in-line disconnects and others which are used unshielded to solve your simple high-voltage interconnection problems.



RMC Series

Anode Connectors

In-Line Disconnects

RMC Series

4RC3147

RMC Series

RMC Series

2RC3146

Rack and Panel Connector

RMC Series

Lanyard Series

Rowe Multiple Contact Connectors and Cable Assemblies

Offer contact arrangements from one to thirty contacts, panel receptacles, cable plugs, rack and panel combinations, in-line types and many others. Both field assemblies and molded-on types are standard in this line.

Rowe Industries has designed and developed over 700 specialized interconnections for which tooling is available.

World's Leader in High-Voltage

(through 200 KV)

Corona-Free CONNECTORS and CABLE ASSEMBLIES

ROWE INDUSTRIES, INC. | Talley™ Industries

Connectors • Cable Assemblies • Electronic Products
Specialists in Corona-Free High Voltage Interconnections

6225 Benore Road • P.O. Box 6877 • Toledo, OH 43612-0877
Toledo: 419-729-9761

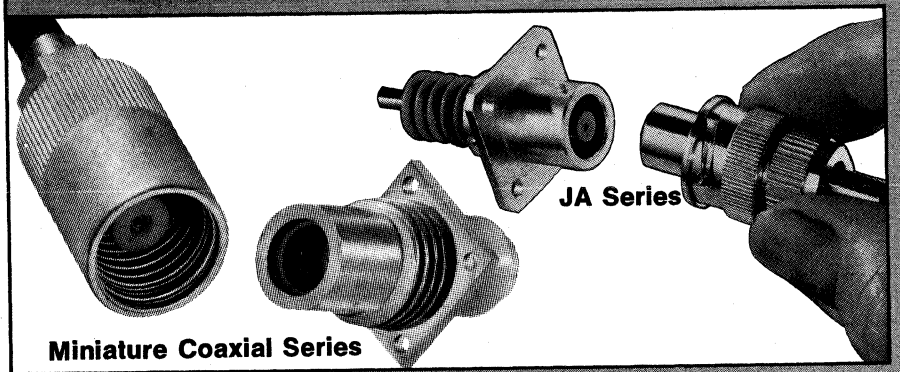
FAX: 419-729-1794 • TWX: 810-442-1734 • East Coast Office: 617-273-3888 • East Coast Fax: 617-272-6724

West Coast Offices: 408-778-6210 • 213-235-2070
West Coast Fax: 408-779-0917

DESIGN — DEVELOPMENT — MANUFACTURING

For reliable high voltage and all temperature wire and cable, see Rowe's ad in the Wire/Cable/Harnesses Section.

FOR YOUR COMMERCIAL, INDUSTRIAL OR MILITARY DESIGN NEEDS

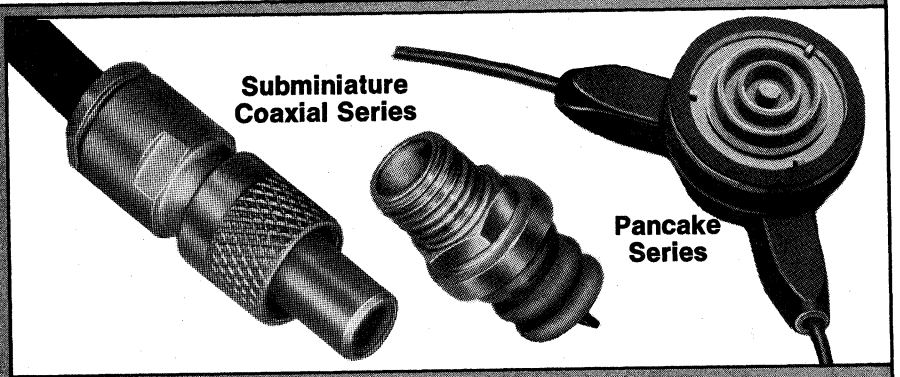


Rowe Miniature Coaxial Connectors and Cable Assemblies

Employ the same high-voltage design techniques as the coaxial series, but are much smaller in size for use in restricted spaces. Available in quick disconnect and screw couplings (the JA Series can be adapted to such standard type cables as RG 58 and RG 59).

Rowe Subminiature Coaxial Connectors and Cable Assemblies

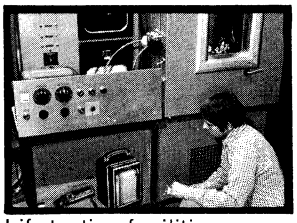
Are ideally suited for use where space is at a premium. Employing the traditional Rowe high capability features, the subminiature sizes offer unusually high voltage operating capabilities, through 20 KV.

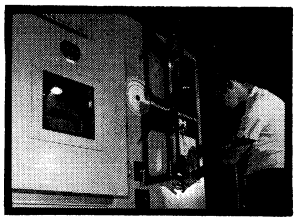


Rowe Low-Voltage, Molded-On Connectors and Cable Assemblies

For use in severe environments. We can mold your STD connectors to cable for an environmental seal and provide a molded strain relief. Our exclusive Insta-Change series was designed for factory, mining, nuclear and oil well use.

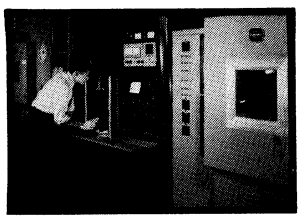
ROWE knows Specialized Interconnections

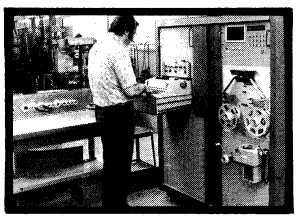

Life testing facilities.

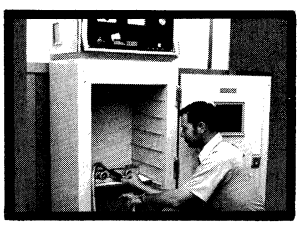

High altitude pressure chamber.

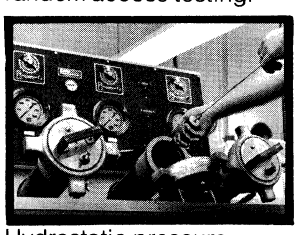
RFI-EMI-EMP test chamber.

High voltage, corona and dielectric test chamber.


Humidity chamber.


DIT-MCO computerized random access testing.


X-Ray equipment.


Hydrostatic pressure testing.

We're specialists in complete interconnection systems and, in particular, connectors and cable assemblies for extreme environments and unique applications. In fact, we've designed and manufactured hundreds of different connectors and cable assemblies for nuclear instrumentation and control, high voltage, corona-free thru 200 KV+, underwater instrumentation, geophysical, high and low temperatures, corrosive environments, high altitude and deep space, high and low pressures and other sophisticated military and industrial systems.

Rowe engineers design and specify custom products to meet exacting requirements and Rowe craftsmen produce them to the highest quality standards. In addition, we operate one of the most complete testing facilities in the industry. Our destructive and non-destructive testing capability includes:

Electrical Testing
Dielectric strength, corona measurement, RFI/EMI and DIT-MCO computer controlled circuit testing.

Mechanical and Physical Testing
Plating verification thru microscopic analysis, shock and vibration, hydrostatic pressure and helium leak, tensile strength,contact force measurement, optical comparitor equipment, complete x-ray lab.

Environmental Testing
Altitude thru 150,000 feet, temperature, humidity, corrosive atmospheres, accelerated life combining various conditions simultaneously.

Quality Control
Rowe's quality control and inspection systems meet or exceed MIL-Q-9858, ISR-1, NRC's 10CFR50 appendix B and standards of all aerospace and industrial firms.

With so many interconnections to choose from, chances are that we've already developed the one that meets your needs. If not, we'll custom design one for you.

Rowe Industries, Dept. 241/6100 Benore Rd, Toledo, OH 43612

Gentlemen: Please send technical literature I've checked. Thank you.

- ☐ Corona: simple techniques to eliminate it
- ☐ H.V. In-Line Disconnects and Anode Connectors thru 60 KV
- ☐ Rowe multi-contact H.V. connectors
- ☐ Sub-Miniature H.V. coax connectors thru 15 KV
- ☐ RG cable H.V. connectors (JA Series)
- ☐ Miniature Coax Connectors thru 30 KV
- ☐ Corona-free coax connectors thru 20 KV
- ☐ Corona-free high pulse coax connectors thru 40 KV
- ☐ 75 KV coax connectors (R75 Series)
- ☐ Lanyard/Umbilical Connectors
- ☐ Triaxial Connectors thru 30 KV
- ☐ Triaxial Connectors thru 55 KV
- ☐ Molded-On Interconnections
- ☐ Low-Voltage Multi-Pin Connectors (Insta-Change Series)
- ☐ High-Voltage Cable & Wire
- ☐ "All-Temp" High Temperature Wire and Cable
- ☐ SRML, SF-2, SFF-2, Aircraft & Locomotive

Print Name _____

Company _____

Address _____

City _____ Zip _____

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West Coast Fax: 408-779-0917

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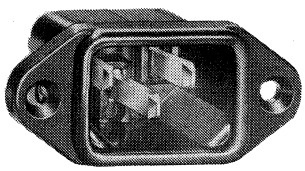
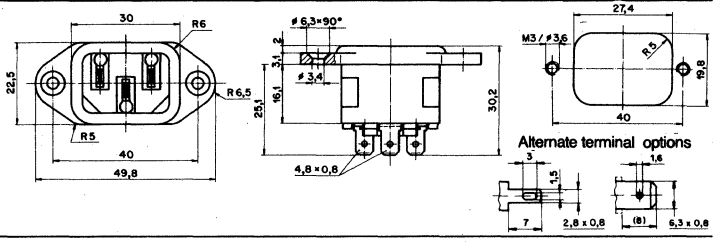
AC POWER CONNECTORS •

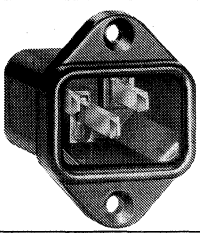
International Standards: CEE, IEC, DIN, SEV, SNV



Chassis mount power connector.
UL and CSA rated at 15A, 125V and 6A, 250V. **VDE** rated at 10A, 250V. **SEMKO and SEV** rated at 6A, 250V. **UL** flame class 94 V-2

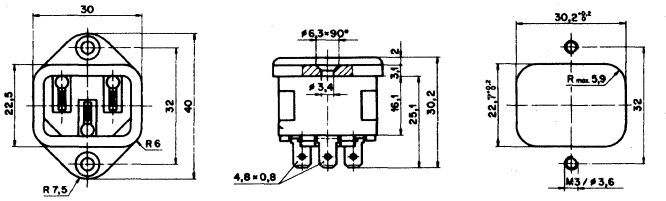
4300.0062
w/.187" x .032" q.d. terminals
4300.0063
w/.250" x .032" q.d. terminals
4300.0064
w/.110" x .032" solder terminals

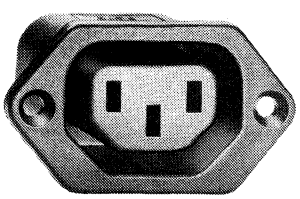




Chassis mount power connector with vertical mounting ears.
UL, CSA, VDE, SEMKO, and SEV rated at 6A, 250V.
UL flame class 94 V-2

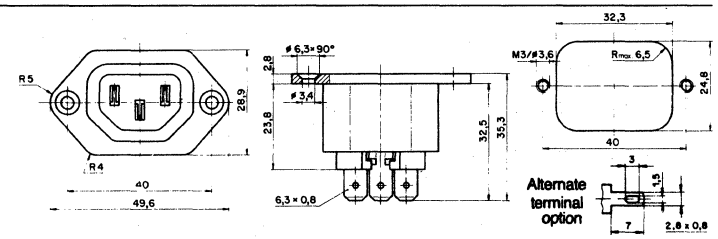
4300.0052
w/.187" x .032" q.d. terminals

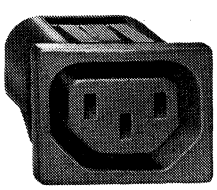




Chassis mount female power connector.
UL, CSA, VDE, and SEV rated at 6A, 250V.
UL flame class 94 V-2

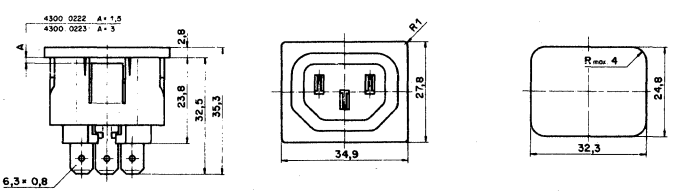
4300.0203
w/.250" x .032" q.d. terminals
4300.0204
w/.110" x .032" solder terminals

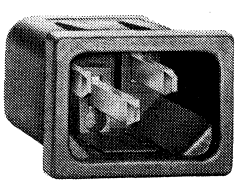




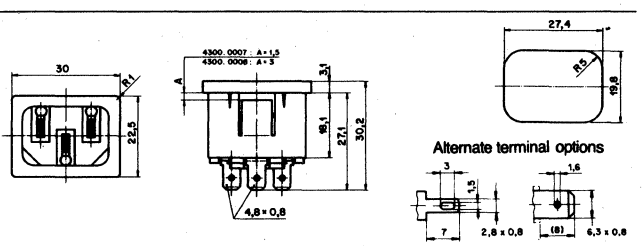
Snap-in female power connector.
UL, CSA, VDE, and SEV rated at 6A, 250V.
UL flame class 94 V-2

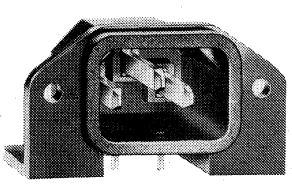
4300.0222 w/.250" x .032" q.d., 1.5 mm panel thickness
4300.0223 w/.250" x .032" q.d., 3.0 mm panel thickness





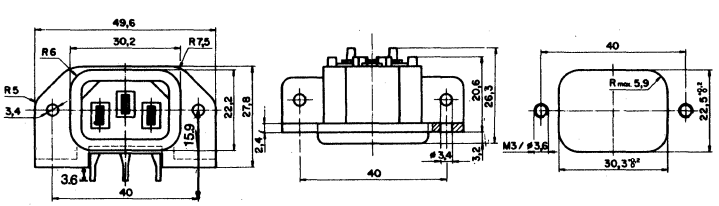
Snap-in power connector. **UL & CSA** rated at 15A, 125V or 6A, 250V. **VDE** rated at 10A, 250V. **SEMKO & SEV** rated at 6A, 250V. **UL** flame class 94 V-2
4300.0007 w/.187" x .032" q.d., 1.5 mm panel thickness
4300.0008 w/.187" x .032" q.d., 3.0 mm panel thickness
4300.0012 w/.250" x .032" q.d. 1.5 mm panel thickness
4300.0013 w/.250" x .032" q.d. 3.0 mm panel thickness
4300.0016 w/.110" x .032", sold. term. 1.5 mm panel thickness

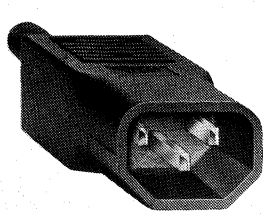


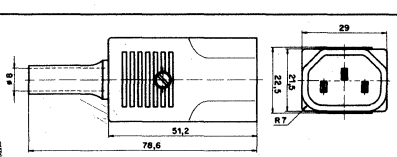


PCB mount power connector.
UL, CSA, VDE, SEMKO, and SEV rated at 6A, 250V.
UL flame class 94 V-2
Wave solderable and washable in aqueous solutions.

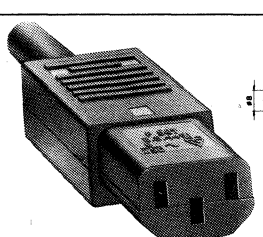
4300.0071
w/pc terminals

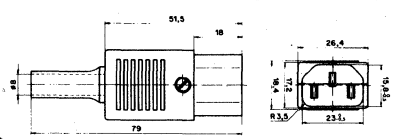






4300.0406 Plug, rated 6A/250V





4300.0602 Female Plug, rated 6A/250V

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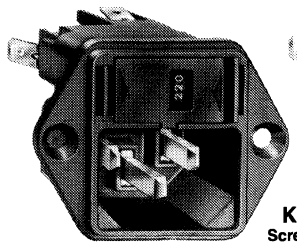
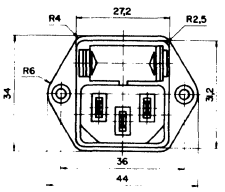
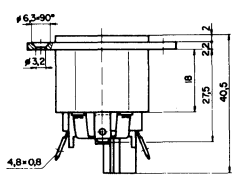
POWER ENTRY MODULES •

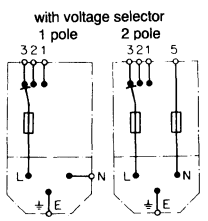
KEA ≙ AC Power Connector with 1 or 2 pole fuseholder and optional 3 position voltage selector.
KEB ≙ AC Power Connector with 1 pole lighted or unlighted 110V or 220V on/off line switch.

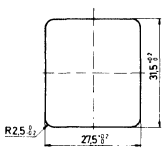


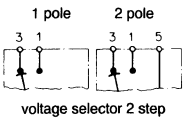
KEA
Screw-on Mount

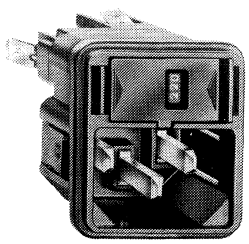




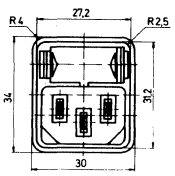


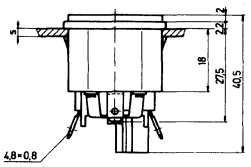


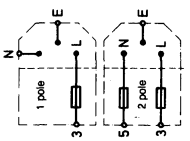




KEA
Snap-on Mount







KEA Part Numbers (casing and fusedrawer must be ordered separately)

CASING PART NUMBERS

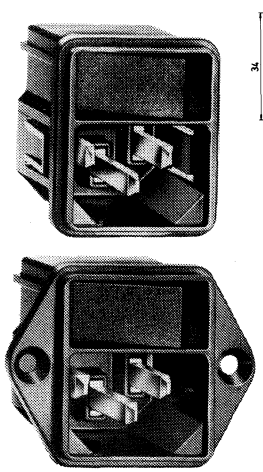
Protection 1 Pole	Protection 2 Pole	Voltage Selector w/out	Voltage Selector with	Mounting Snap-in 1.5	Mounting Snap-in 2.0	Mounting Snap-in 2.5	Mounting Screw-on
KEA 4301.0021	KEA 4301.0001		•				•
4301.0022	4301.0002		•	•			
4301.0023	4301.0003		•		•		
4301.0024	4301.0004		•			•	
4301.0521	4301.0501	•					•
4301.0522	4301.0502	•		•			
4301.0523	4301.0503	•			•		
4301.0524	4301.0504	•				•	

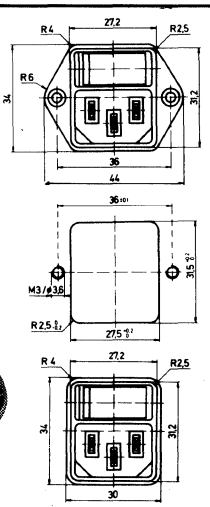
FUSEDRAWER PART NUMBERS

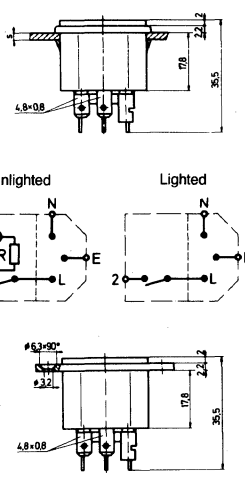
Voltage Marking	Protection 1 Pole	Protection 2 Pole
110, 150, 220	4301.1201	4301.1001
110, 220, 240	4301.1212	4301.1012
N/A	4301.1405	4301.1401

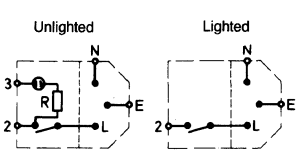
UL, CSA, VDE, SEMKO and SEV rated @ 10A, 250V.

KEB









Part Numbers

	Lighted Switch 110V 220V	Unlighted Switch	Mounting Snap-in 1.5 mm	Mounting Snap-in 2.0 mm	Mounting Snap-in 2.5 mm	Mounting Screw-on
KEB 4302.0001		•				•
4302.0002		•	•			
4302.0003		•		•		
4302.0004		•			•	
4302.0101	•					•
4302.0102	•		•			
4302.0103	•			•		
4302.0104	•				•	
4302.0121	•					•
4302.0122	•		•			
4302.0123	•			•		
4302.0124	•				•	

UL, CSA, VDE, SEMKO and SEV rated @ 10A, 250V.

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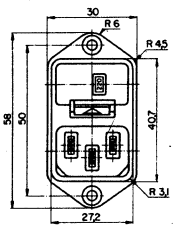
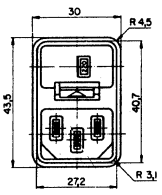
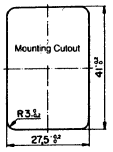
POWER ENTRY MODULES •

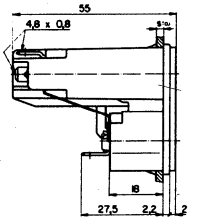
KEC, KD ⏚ AC Power Connector with 1 or 2 pole fuseholder for 5 x 20 mm or ¼ x 1¼" fuses and optional 2 or 4 position voltage selector. KD includes on/off line switch.

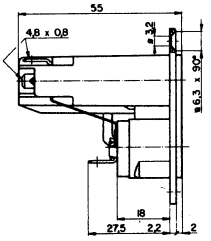
Example of
KEC





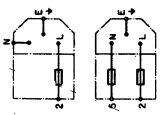






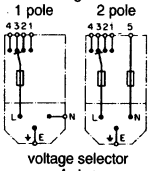
without voltage selector

1 pole 2 pole



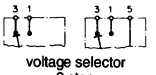
with voltage selector

1 pole 2 pole

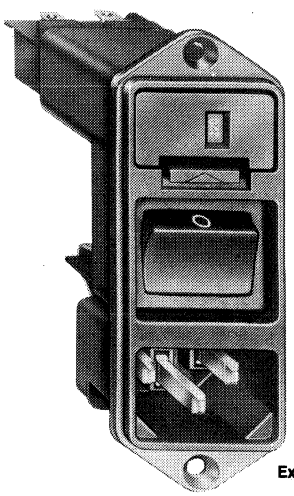


voltage selector
4 step

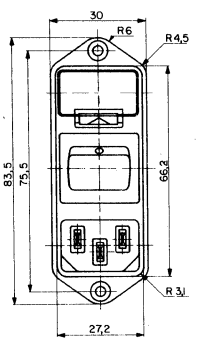
1 pole 2 pole

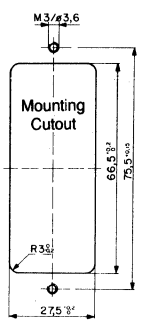


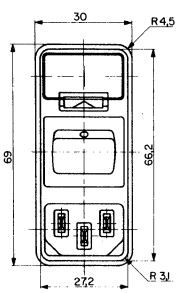
voltage selector
2 step

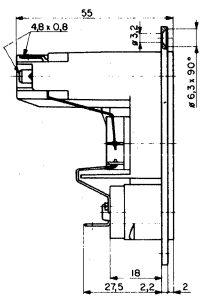


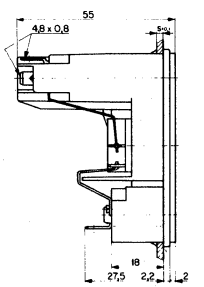
Example
KD





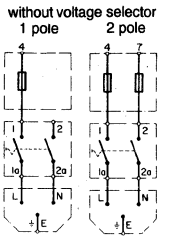






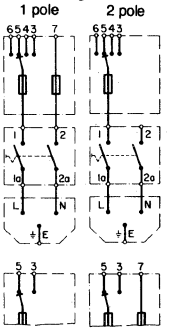
without voltage selector

1 pole 2 pole



with voltage selector

1 pole 2 pole



voltage selector 2 step

KEC, KD Part Numbers (casing and fusedrawer must be ordered separately)

CASING PART NUMBERS

Protection 1 Pole	Protection 2 Pole	Voltage Selector w/out	Voltage Selector with	Mounting Snap-in 1.5mm	Mounting Snap-in 2.0mm	Mounting Snap-in 2.5mm	Screw-on
KEC 4303.0211	KEC 4303.0181		•				•
4303.0212	4303.0182		•	•			
4303.0213	4303.0183		•		•		
4303.0214	4303.0184		•			•	
4303.0031	4303.0001	•					•
4303.0032	4303.0002	•		•			
4303.0033	4303.0003	•			•		
4303.0034	4303.0004	•				•	
KD 13.4101.151	KD 14.4101.151		•				•
13.4101.105	14.4101.105		•	•			
13.4101.107	14.4101.107		•		•		
13.4101.109	14.4101.109		•			•	
13.1101.151	14.1101.151	•					•
13.1101.105	14.1101.105	•		•			
13.1101.107	14.1101.107	•			•		
13.1101.109	14.1101.109	•				•	

FUSEDRAWER PART NUMBERS

Voltage Marking	Protection 1 Pole 5 x 20 mm	Protection 2 Pole 5 x 20 mm
100, 120, 220, 240	4303.2114.01	4303.2014.01
110. 220	4303.2114.03	4303.2014.03
blank	4303.2406	4303.2401

Voltage Marking	Protection 1 Pole ¼ x 1¼"	Protection 2 Pole ¼ x 1¼"
100, 120, 220, 240	4303.2814.01	4303.2714.01
110, 220	4303.2814.03	4303.2714.03
blank	4303.2907	4303.2902

APPROVAL RATINGS:	KEC	KD
UL	15A, 250V	10A, 250V
CSA	16A, 250V	10A, 250V
VDE	10A, 250V	10A, 250V
SEMKO	10A, 250V	10A, 250V
SEV	10A, 250V	10A, 250V

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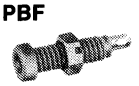
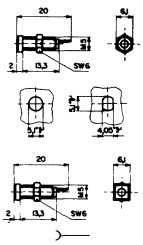
TEST JACKS AND PROBES

.080" For Panel and PCB Mounting

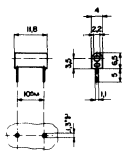
PBF





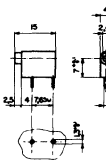
040.1031 black
040.1032 red
040.1033 green
040.1034 blue
040.1035 yellow

PB



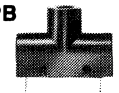
040.1071 black
040.1072 red
040.1073 green
040.1074 blue
040.1075 yellow

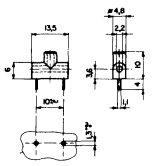
PB



040.1011 black
040.1012 red
040.1013 green
040.1014 blue
040.1015 yellow

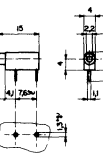
PB





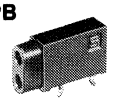
040.1021 black
040.1022 red
040.1023 green
040.1024 blue
040.1025 yellow

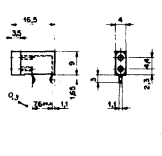
PB



040.1101 black
040.1102 red
040.1103 green
040.1104 blue
040.1105 yellow

PB

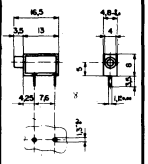




040.1151 black
040.1152 red
040.1153 green
040.1154 blue
040.1155 yellow

PBD

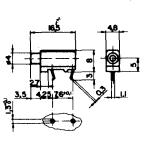
flux proof



040.1211 black
040.1212 red
040.1213 green
040.1214 blue
040.1215 yellow

PBD

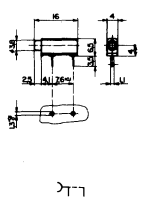
flux proof



040.1281 black
040.1282 red
040.1283 green
040.1284 blue
040.1285 yellow

PBK

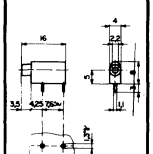
flux proof



040.1311 black

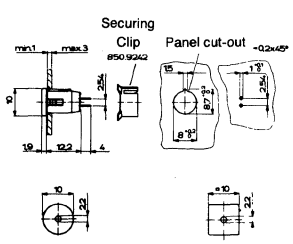
other colors on special order

PB



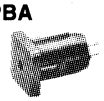
040.1111 black
040.1112 red
040.1113 green
040.1114 blue
040.1115 yellow

PBA



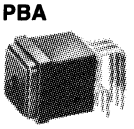
040.9202 red
040.9206 black

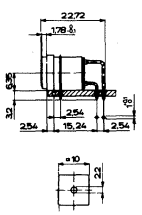
PBA



040.9212 red
040.9216 black

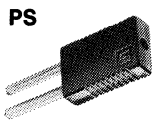
PBA

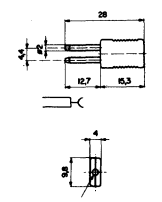




040.9222 red
040.9226 black

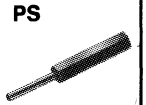
PS

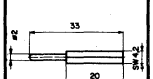




040.1161 black
040.1162 red
040.1163 green
040.1164 blue
040.1165 yellow

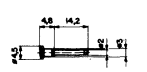
PS





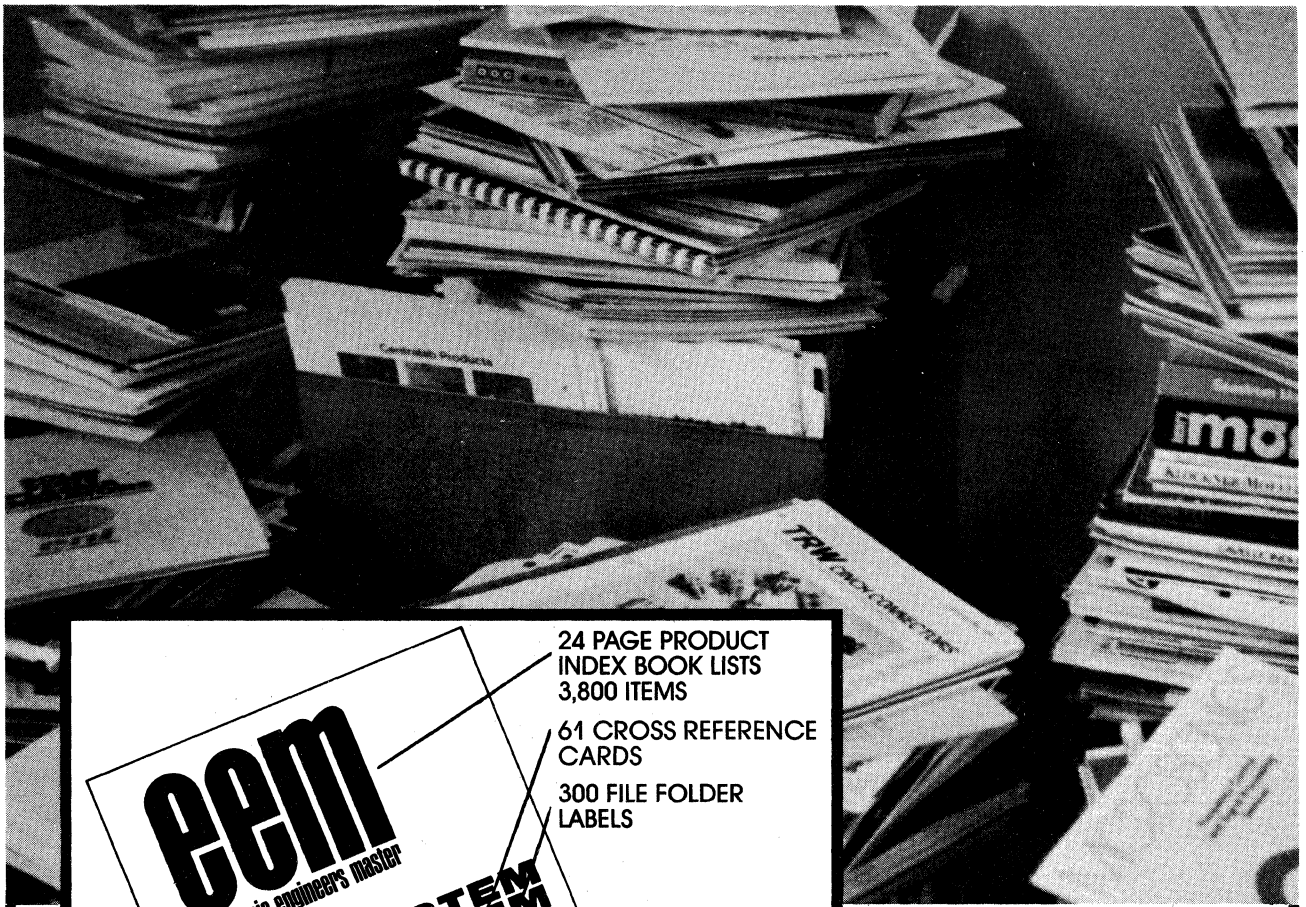
040.1141 black
040.1142 red
040.1143 green
040.1144 blue
040.1145 yellow

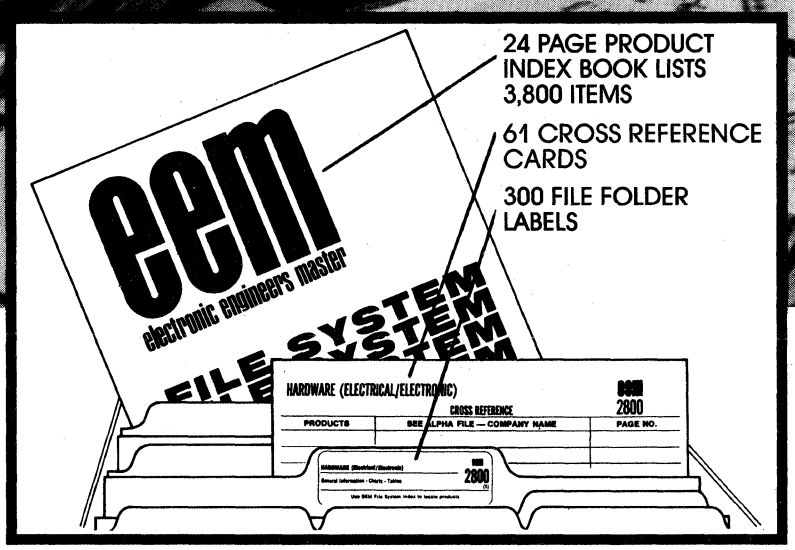
PS



040.1061 black
040.1062 red
040.1063 green
040.1064 blue
040.1065 yellow

	PB 040.1011 -.1015	PB 040.1021 -.1025	PBF 040.1031 -.1035	PS 040.1061 -.1065	PB 040.1071 -.1075	PB 040.1101 -.1105	PB 040.1111 -.1115	PS 040.1141 -.1145	PB 040.1151 -.1155	PS 040.1161 -.1165	PBD 040.1211 -.1215	PBD 040.1281 -.1285	PBK 040.1311 -	PBA 040.9202 -.9226
Rated current	10 A	6.3 A	6.3 A	6.3 A	6.3 A	10 A	10 A	10 A	6.3 A	6.3 A	6.3 A	6.3 A	10 A	2 A
Insulation resistance Contact/Contact	-	-	-	-	-	$>10^4$mΩ	$>10^4$mΩ	-	$>10^4$mΩ	-	$>10^4$mΩ	$>10^4$mΩ	$>10^4$mΩ	-
dry. 500 V = Contact/Mounting plate	$>10^4$mΩ	$>10^4$mΩ	$>10^4$mΩ			$>10^4$mΩ	$>10^4$mΩ		$>10^4$mΩ	$>10^4$mΩ	$>10^4$mΩ	$>10^4$mΩ	$>10^4$mΩ	$>10^4$mΩ
Contact resistance at 20 m V	<7mΩ	<7mΩ	<5mΩ	-	<10mΩ	<7mΩ	<7mΩ	-	<7mΩ	<7mΩ	<10mΩ	<10mΩ	<5mΩ	<5mΩ
Test voltage, dry Contact/Contact	-	-	-	-	-	>3 kV	>2 kV	-	>2 kV	-	>2 kV	>2 kV	>2 kV	-
50 Hz, 1 min. Contact/Mounting plate	>2 kV	>1 kV	>1.5 kV		>0.5 kV	>3 kV	>3 kV		>2 kV	>1.8 kV	>2 kV	>1.2 kV	>3 kV	>1.5 kV
Temperature rating at no current	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C	-25°C-+100°C
Temperature rating at rated current	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C	-25°C-+70°C
Solderability 2 sec. 235°C IEC 68-2-20 Test Ta method 1	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Soldering Heat resistance 3 sec. 350°C			•											
5 sec. 260°C IEC 68-2-20 Test Tb method 1A	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Contact material	0.5μm Au	0.5μm Au	0.5μm Au	1μm Au	0.5μm Au	0.5μm Au	1μm Au	1.5μm Au	2μm Au	2μm Au	2.5μm Au	1μm Au	1μm Au	0.5μm Au on 2μNi
Insulator material	Polycarbonate											Polybutylen-therephtalate		Polycar-bonate
UL Flamability rating	UL 94 V-2											UL 94 V-0		UL 94 V-2





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  modular, panel mount, chassis mount, pin printed circuit mount, DIN, coaxial cable, cable, miniature consent, feeder consent, tube socket, BNC, UHF, and MIC
- *Jacks:*
  RCA phono and chassis mount, communications, phone, multi-conductor, closed and open circuit, stereo, in-line, barrel, sub miniature enclosed phone, PC mount, panel mount, DC, open frame, DC power, earphone, DIN, headphone, combination, auto antenna, pin polarized, and banana
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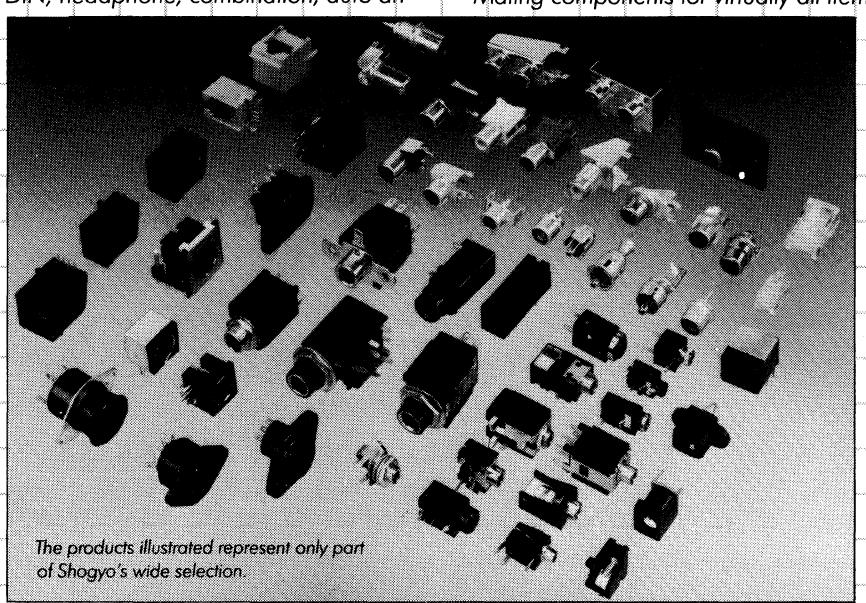
And featuring:

- *Shielding*
- *A wide variety of angles, mountings, sizes and shapes*
- *Mating components for virtually all items*



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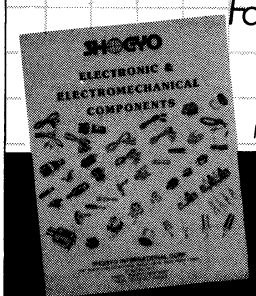

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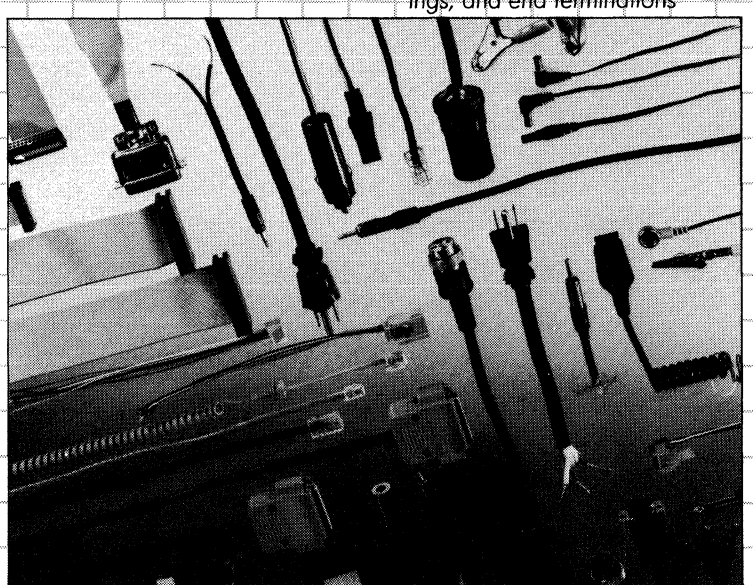
  coiled, straight, round, flat, or oval; copper, stranded or tinsel; with 4, 6 or 8-position modular plugs or spade lugs; and keyed or un-keyed for mating with connectors
- *Audio:*
  shielded, unshielded, single or multi-conductor, with molded plugs and in-line jacks
- *Zip:*
  standard or custom lengths, gauges, insulation thicknesses and jacket colors, with DC or phone plugs in a variety of sizes
- *Computer/Video:*
  (from 9–50 pins, male or female, plastic or metal, low-profile, edgewise or multi-polar), DIN cables produced to spec (available with shielding), and RCA phono
- *Power:*
  European or American, single or multi-conductor, custom made to specified current and temperature ratings, standard SPT-1 & 2, ST, SVT, SJT, XT or PXT, UL/CSA approved

And featuring:

- *A comprehensive selection of lengths, thicknesses, coilings, and end terminations*



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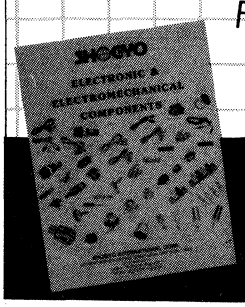

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SHOGYO BATTERY HOLDERS & SNAPS

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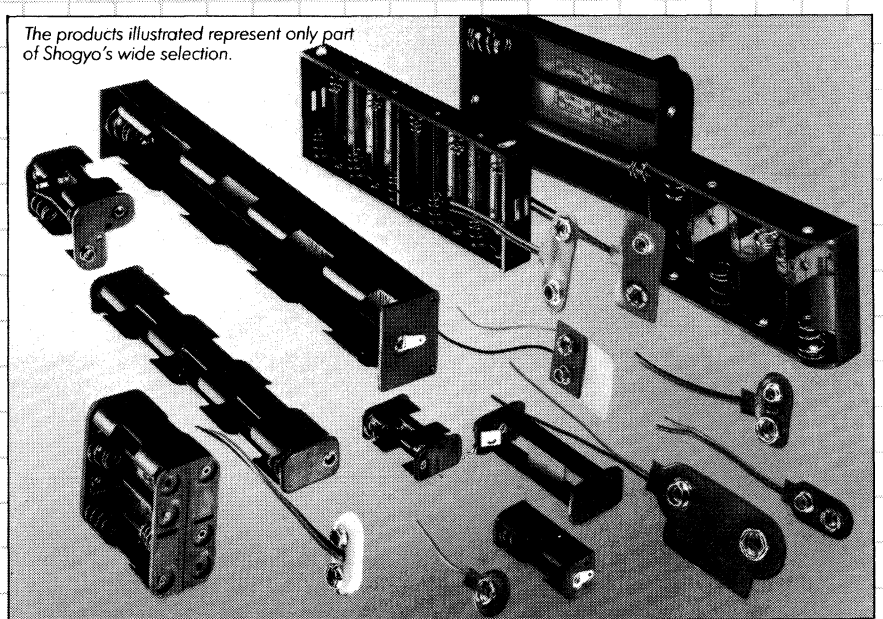
Including a diverse offering of:
- *D, C, A, AA, AAA holders.*
- *1, 2, 3, 4, 6, 8, 10 cell holders.*
- *Specialty holders (eg. two C cell/one 9V holders).*
- *Standard and high-retention holders.*
- *Holders and snaps with PC mountable pins.*
- *Holders with pre-fitted mounting holes; battery snaps, lead wires, or solder terminals; black, white or metal finishes; and polyethylene, UL 94 VO or stainless steel construction.*
- *Snaps in your choice of mountings, or unmounted.*
- *Snaps made from stainless steel or extra high-retention phosphorous-bronze.*
- *Hand straps in nylon, vinyl and cloth, your choice of lengths and attachment devices.*
- *And much more.*



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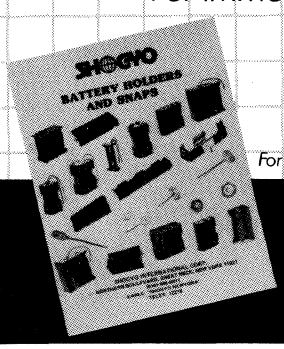

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- G.E.
- National
- Raytheon
- R.C.A.
- Varian (Klystrons)

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- Electrovert
- Heli-Tube
- Panduit

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- Belden
- Cablewave
- Carol
- Iboco
- Madison
- Manhattan
- Quabbin

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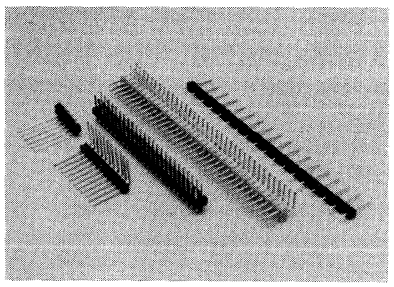
CURTIS

Printed Circuit Board Interconnections



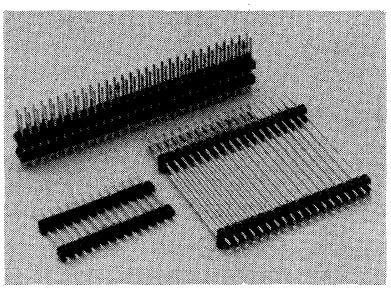
Pin Headers

Retention Tail

.025" Square Pin Headers are available in single row 1-36 positions and dual row 2-72 positions, straight and right angle versions. These pin headers are available with the following features and options.

- PCB retention tail*
- SMT
- Tin overall or selective gold plating
- Variety of post heights and tail lengths
- Variety of housing materials for high temperature applications

* Specialty Electronics Inc. Retention Tail covered by U.S. patent and/or patents pending.



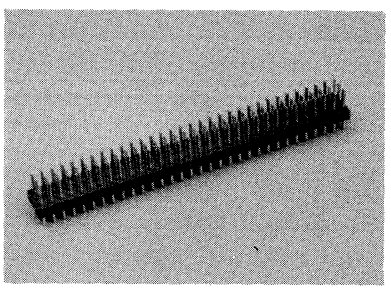
Stacking Pin Headers

Retention Tail

.025" Square Stacking Pin Headers are available in single row 1-36 positions and dual row 2-72 positions, straight headers. These stacking pin headers are available with the following features and options.

- PCB retention tail*
- High temperature housing material available
- Tin overall or selective gold plating
- Variety of post heights and tail lengths

*Specialty Electronics Inc. Retention Tail covered by U.S. patent and/or patents pending.



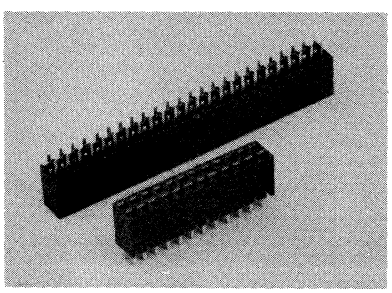
Three Row Pin Headers

Retention Tail

.025" Square Three Row Pin Headers are available in straight and right angle configurations.

- PCB retention tail* (optional)
- Sizes 9 to 108 positions
- High temperature housing material available
- Tin overall or selective gold plating

*Specialty Electronics Inc. Retention Tail covered by U.S. patent and/or patents pending.

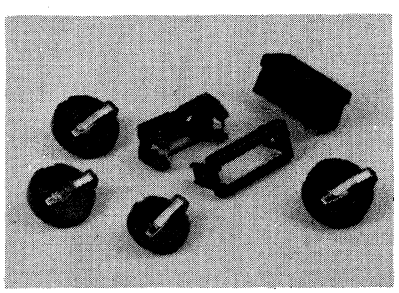


.025 Receptacles

Board Retention Feature

.025" Square Receptacles are available in a variety of sizes and configurations as follows.

- Variety of housing materials for high temperature applications
- Variety of configurations, single and dual row versions, up to 64 positions per row with vertical and horizontal pin entry
- SMT
- PCB retention tail
- Dimensions are compatible with other manufacturers



Battery Holders

Battery Holders for lithium coin cell batteries & 1/2 AA standard horizontal cylindrical cells.

- Compatible with existing board layouts.
- Easy battery insertion and removal.
- High contact force.
- Housing material: glass filled polyester, UL 94 V-O.
- Battery Holder specials and other sizes will be considered.

SPECIALTY ELECTRONICS INCORPORATED

105 E. Rutherford Street, Landrum, S.C. 29356, TEL (803) 457-3824, FAX (803) 457-2535

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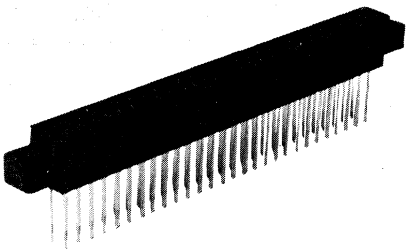
EZ SERIES—HIGH PROFILE DIP SOLDER/WIRE WRAP*

* Trademark of Gardner Denver

LOW-PROFILE SERIES ALSO AVAILABLE, CONTACT FACTORY FOR DETAILS



FEATURES

- Insulation Resistance: 5,000 Megohms
- Solvent Resistance: Perchloroethylene Freon 113, Freon 11, Trichloroethylene
- Rated Voltage (At sea level): 600 VDC, 800 VDC, 1800 VDC, for contact centers of .100, .125, .156, respectively
- Current Rating: 3 amperes

MATERIALS

- Insulator: Glass filled thermoplastic polyester (Blue Valox)
- Contacts: Phosphor Bronze contacts with gold or tin/lead over nickel plating

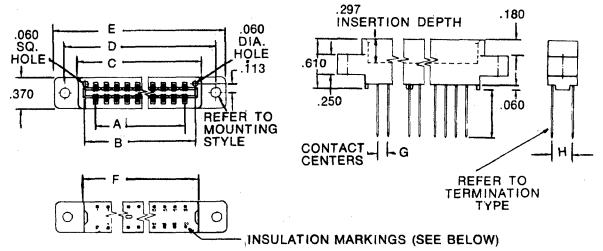
- Voltage Drop: 30 MV at rated current
- Contact Resistance: 10 milliohms maximum
- Operating Temperature: −65°C to +125°C
- Board Insertion Force: 16 ozs maximum per contact pair using .062 steel test blade
- Board Withdrawal Force: 1 oz minimum per contact pair using .062 steel test blade
- Accommodates .062 PC board
- Bifurcated bellows contacts

POLARIZATION KEYS

- P/N PLC-K1 (Order separately) for between contact polarization

DIMENSIONS

	Part Number*	No. of Contacts	Contact ID TYPE	A	B	C	D	E	F	G	H
.100 CONTACT CENTERS	EZC 06D _ _	**6/12**	**5**	**.500**	**.700**	.760	1.075	1.435	0.750	.100	.200
	EZC 08D _ _	8/16	5	**0.700**	**0.900**	0.960	1.275	1.635	0.950	.100	.200
	EZC 10D _ _	10/20	5	0.900	**1.100**	1.260	1.575	1.835	1.150	.100	.200
	EZC 12D _ _	12/24	5	1.100	1.300	1.460	1.775	2.035	1.350	.100	.200
	EZC 15D _ _	15/30	5	1.400	1.600	1.760	2.075	2.335	1.650	.100	.200
	EZC 17D	17/34	5	1.600	1.700	1.860	2.175	2.535	1.850	.100	.200
	EZC 18D _ _	18/36	5	1.700	1.900	2.060	2.375	2.635	1.950	.100	.200
	EZC 20D _ _	20/40	5	1.900	2.100	2.260	2.575	2.835	2.150	.100	.200
	EZC 22D _ _	22/44	5	2.100	2.300	2.460	2.775	3.035	2.350	.100	.200
	EZC 25D _ _	25/50	5	2.400	2.600	2.760	3.075	3.335	2.650	.100	.200
	EZC 28D _ _	28/56	5	2.700	2.900	3.060	3.375	3.635	2.950	.100	.200
	EZC 30D _ _	30/60	5	2.900	3.100	3.260	3.575	3.835	3.150	.100	.200
	EZC 31D _ _	31/62	5	3.000	3.200	3.360	3.675	3.935	3.250	.100	.200
	EZC 35D _ _	35/70	5	3.400	3.600	3.760	4.075	4.335	3.650	.100	.200
	EZC 36D _ _	36/72	5	3.500	3.700	3.860	4.175	4.435	3.750	.100	.200
	EZC 40D _ _	40/80	5	3.900	4.100	4.260	4.575	4.835	4.150	.100	.200
	EZC 43D _ _	43/86	5	4.200	4.400	4.560	4.875	5.135	4.450	.100	.200
	EZC 44D _ _	44/88	5	4.300	4.500	4.660	4.975	5.235	4.550	.100	.200
	EZC 49D _ _	49/98	5	4.800	5.000	5.160	5.475	5.735	5.050	.100	.200
	EZC 50D _ _	50/100	5	4.900	5.100	5.260	5.575	5.835	5.150	.100	.200
	EZC 55D _ _**	55/110	5	5.400	5.600	5.760	6.075	6.335	5.650	.100	.200
	EZC 60D _ _	60/120	5	5.900	6.100	6.260	6.575	6.835	6.150	.100	.200
	EZC 61D _ _	61/122	5	6.000	6.200	6.360	6.675	6.935	6.250	.100	.200
	EZC 65D _ _	65/130	5	6.400	6.600	6.760	7.075	7.335	6.650	.100	.200
	EZC 70D _ _	70/140	5	6.900	7.100	7.260	7.575	7.835	7.150	.100	.200
.125 CONTACT CENTERS	EZA 06D _ _	6/12	5	0.625	0.875	1.035	1.295	1.555	0.875	.125	.250
	EZA 10D _ _	10/20	5	1.125	1.375	1.535	1.795	2.055	1.375	.125	.250
	EZA 14D _ _**	14/28	5	1.625	1.875	2.035	2.295	2.555	1.875	.125	.250
	EZA 15D _ _	15/30	5	1.750	2.000	2.160	2.420	2.680	2.000	.125	.250
	EZA 18D _ _	18/36	5	2.125	2.375	2.535	2.795	3.055	2.375	.125	.250
	EZA 22D _ _	22/44	5	2.625	2.875	3.035	3.295	3.555	2.875	.125	.250
	EZA 24D _ _**	24/48	5	2.875	3.125	3.285	3.545	3.805	3.125	.125	.250
	EZA 25D _ _	**25/50**	**5**	**3.000**	**3.250**	**3.410**	**3.670**	**3.930**	**3.250**	**.125**	**.250**
	EZA 28D _ _	28/56	5	3.375	3.625	3.785	4.045	4.305	3.625	.125	.250
	EZA 30D _ _	30/60	5	3.625	3.875	4.035	4.295	4.555	3.875	.125	.250
	EZA 31D _ _	31/62	5	3.750	4.000	4.160	4.420	4.680	4.000	.125	.250
	EZA 32D _ _	32/64	5	3.875	4.125	4.285	4.545	4.805	4.125	.125	.250
	EZA 35D _ _	35/70	5	4.250	4.500	4.660	4.920	5.180	4.500	.125	.250
	EZA 36D _ _	36/72	5	4.375	4.625	4.785	5.045	5.305	4.625	.125	.250
	EZA 40D _ _	40/80	5	4.875	5.125	5.285	5.545	5.805	5.125	.125	.250
	EZA 43D _ _	43/86	5	5.250	5.500	5.660	5.920	6.180	5.500	.125	.250
	EZA 44D _ _	44/88	5	5.375	5.625	5.785	6.045	6.305	5.625	.125	.250
	EZA 45D _ _	**45/90**	**5**	**5.500**	**5.750**	5.910	6.170	**6.430**	**5.750**	.125	**.250**
	EZA 49D _ _	49/98	5	6.000	6.250	6.410	6.670	6.930	6.250	.125	.250
	EZA 50D _ _	50/100	5	6.125	6.375	6.535	6.795	7.055	6.375	.125	.250
.156 CONTACT CENTERS	EZM06D _ _	6/12	6	0.780	1.102	1.221	1.534	1.784	1.030	.156	.200
	EZM08D _ _**	8/16	6	1.092	1.414	1.533	1.846	2.096	1.342	.156	.200
	EZM10D _ _	10/20	6	1.404	1.726	1.845	2.158	2.408	1.654	.156	.200
	EZM12D _ _	12/24	6	1.716	2.038	2.157	2.470	2.720	1.966	.156	.200
	EZM15D _ _	15/30	6	2.184	2.506	2.625	2.938	3.188	2.434	.156	.200
	EZM18D _ _	18/36	6	2.652	2.974	3.093	3.406	3.656	2.902	.156	.200
	EZM20D _ _**	20/40	6	2.964	3.286	3.405	3.718	3.968	3.214	.156	.200
	EZM22D _ _	22/44	6	3.276	3.598	3.717	4.030	4.330	3.526	.156	.200
	EZM24D _ _	24/48	6	3.588	3.910	4.029	4.342	4.642	3.838	.156	.200
	EZM25D _ _	25/50	6	3.744	4.066	4.185	4.498	4.748	3.994	.156	.200
	EZM28D _ _	28/56	7	4.212	4.534	4.653	4.966	5.216	4.462	.156	.200
	EZM30D _ _	30/60	6	4.524	4.846	4.965	5.278	5.528	4.774	.156	.200
	EZM31D _ _	31/62	7	4.680	5.002	5.121	5.434	5.684	4.930	.156	.200
	EZM36D _ _	36/72	8	5.460	5.782	5.901	6.214	6.464	5.710	.156	.200
	EZM40D _ _	40/80	8	6.084	6.406	6.525	6.838	7.088	6.334	.156	.200
	EZM43D _ _	43/86	8	6.552	6.874	6.993	7.306	7.556	6.802	.156	.200

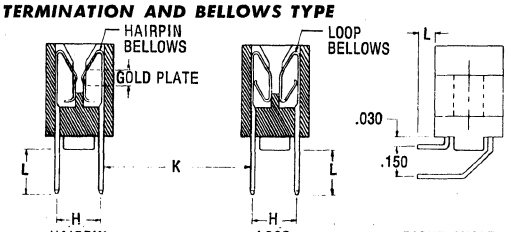


CONTACT ID TYPE	INSULATOR MARKINGS LETTERS G, I, O & Q NOT USED
5	1 3 ..... 45 47 ..... 89 91 ..... 2 4 ..... 46 48 ..... 90 92 .....
6	1 2 ..... 23 24 ..... 45 46 ..... A B ..... A B ..... a b .....
7	1 2 ..... 23 24 ..... 45 46 ..... A B ..... A B ..... a b .....
8	A B ..... A B ..... a b ..... 1 2 ..... 23 24 ..... 45 46 .....

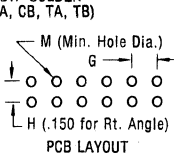
* For complete part number, add termination type and mounting style from PART NUMBER CODING (e.g.: EZA40DRMH).

** Consult factory for availability.

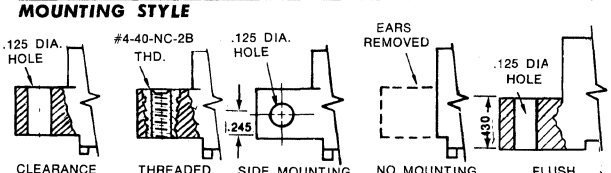
TERMINATION AND BELLOWS TYPE



HAIRPIN	LOOP	TERMINATION	K	L	M
CK	TK	Dip Solder	.026 Round	.190	.030
CS	RS	Dip Solder	.025 Square	.190	.040
CM	RM	Wire Wrap	.025 Square	.560	.040
CA	TA	Right Angle	.025 Square	.100	.043
CB	TB	Right Angle	.025 Square	.180	.043
CT		Dip Solder	.015 x .025	.165	.030
CW		Dip Solder	.015 x .025	.125	.030



MOUNTING STYLE



PART NUMBER CODING

EXAMPLE: E Z C 22 D CS H

MATERIALS
E = Valox/Phosphor Bronze

PLATING

Contact Surface	Termination
Z = .000010 Gold	.000100 Tin/Lead
X = .000030 Gold	.000100 Tin/Lead
G = .000010 Gold	.000005 Gold
Y = .000030 Gold	.000005 Gold

CONTACT CENTERS
C = .100, A = .125, M = .156

NUMBER OF POSITION — 06 thru 70

READOUT — D = Dual

TERMINATION TYPE (SEE TABLE)

Hairpin Bellows	Loop Bellows
CS = .025 x .025 dip solder	RS = .025 x .025 dip solder
CK = .026 round dip solder	TK = .026 round dip solder
CM = .025 x .025 wire wrap	RM = .025 x .025 wire wrap
CA = right angle dip solder	TA = right angle dip solder
CB = right angle dip solder	TB = right angle dip solder
CT = .015 x .025 dip solder	

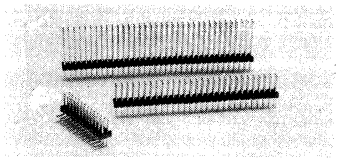
MOUNTING (SEE ABOVE)—H, I, S, N, W or X

SULLINS ELECTRONICS CORPORATION / P.O. Box 189E. San Marcos, CA 92069 / (619) 744-0125 / TWX 910-322-1472 / FAX 619/744-6081

Sullins ELECTRONICS CORP. / PRINTED CIRCUIT CONNECTORS

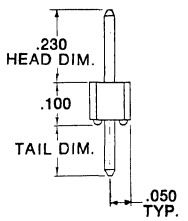
PZ SERIES—.025 SQ. POST HEADERS

(.100 x .100 GRID)



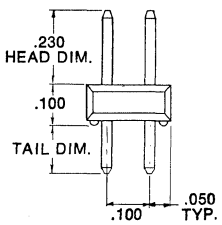
.230 HEAD LENGTHS

PZCS**N**
(See P/N Coding)



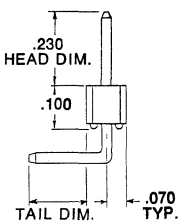
**TERM P/N CODE	TAIL DIM.
AA	.120 in.
AB	.210 in.
AC	.310 in.
AD	.410 in.
AE	.510 in.
AF	.610 in.
AG	.710 in.
AH	.810 in.

PZCD**N**
(See P/N Coding)



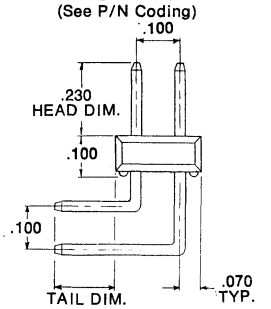
**TERM P/N CODE	TAIL DIM.
AA	.120 in.
AB	.210 in.
AC	.310 in.
AD	.410 in.
AE	.510 in.
AF	.610 in.
AG	.710 in.
AH	.810 in.

PZCS**N**
(See P/N Coding)



**TERM P/N CODE	TAIL DIM.
BA	.100 in.
BB	.200 in.
BC	.300 in.
BD	.400 in.
BE	.500 in.
BF	.600 in.
BG	.700 in.

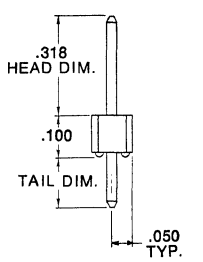
PZCD**N**
(See P/N Coding)



**TERM P/N CODE	TAIL DIM.
BA	.100 in.
BB	.200 in.
BC	.300 in.
BD	.400 in.
BE	.500 in.

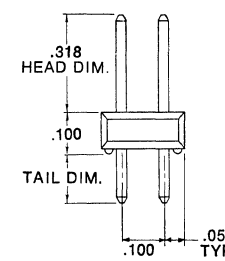
.318 HEAD LENGTHS

PZCS**N**
(See P/N Coding)



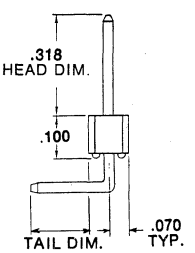
**TERM P/N CODE	TAIL DIM.
FA	.120 in.
FB	.210 in.
FC	.310 in.
FD	.410 in.
FE	.510 in.

PZCD**N**
(See P/N Coding)



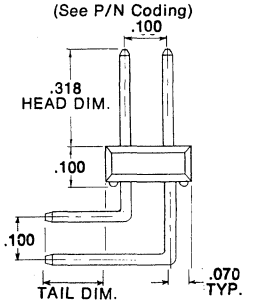
**TERM P/N CODE	TAIL DIM.
FA	.120 in.
FB	.210 in.
FC	.310 in.
FD	.410 in.
FE	.510 in.

PZCS**N**
(See P/N Coding)



**TERM P/N CODE	TAIL DIM.
GA	.100 in.
GB	.200 in.
GC	.300 in.
GD	.400 in.

PZCD**N**
(See P/N Coding)



**TERM P/N CODE	TAIL DIM.
GA	.100 in.
GB	.200 in.

PART NUMBER CODE

P Z C 32 D AA N — MXXX

SERIES
P = .025 Sq. Post Head

CONTACT FINISH

Head Surface	Tail Surface
Z = .000010 Gold	.000100 Tin
X = .000030 Gold	.000100 Tin
G = .000010 Gold	.000005 Gold
Y = .000030 Gold	.000005 Gold
T = .000100 Tin	.000100 Tin

CONTACT CENTERS
C = .100(2.54)

NUMBER OF POSITIONS
01 thru 36 Consult Factory for 50 Position
(e.g. 32 Dual = 64 contacts)

READOUT
S = Single
D = Dual

TERMINATION TYPE
AA, AB, AC, AD, AE, AF, AG, AH,
FA, FB, FC, FD, FE,
BA, BB, BC, BD, BF, BG, GA, GB,
GC, GD
Consult Factory for Other Termination Types

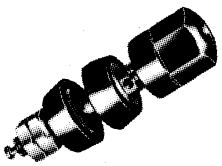
MOUNTING STYLE
N = Standard
R = Retent Lead (Consult Factory)

MODIFICATION
(Consult Factory)
Omit for Standard

SULLINS ELECTRONICS CORPORATION / P.O. Box 189E. San Marcos, CA 92069 / (619) 744-0125 / TWX 910-322-1472 / FAX 619/744-6081

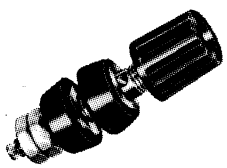
5-way® BINDING POSTS

5 WAYS TO CONNECT • GOLD-PLATED BRASS PARTS • RANGE OF COLORS



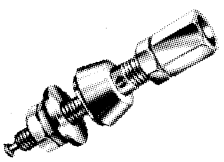
FLUTED NUT TYPES

Plastic parts of standard (not miniature) size types molded of Lexan polycarbonate resin; brass parts are gold-plated. Rated for 30 amperes, 1000 volts working. Available with #8-32 or #10-32 stud behind panel.



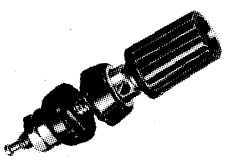
HEX NUT TYPES

Rated for 30 amperes, 1000 volts working. Brass parts gold-plated; plastic parts are of nylon compounded to meet military specifications MIL-P-20693A, Type IV. Available with #8-32 or #10-32 stud behind panel.



GROUNDING TYPE

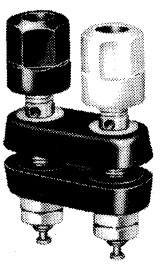
For making rapid connections to ground. Made of finely machined brass nickel-plated and polished. Panel grounding collar frozen to shaft has "D" type shoulder for locking in keyed panel hole. Has #10-32 stud behind panel.



MINIATURE TYPES

Fluted nut design. Rated for 15 amperes, 1000 volts working. Nylon parts meet military specification MIL-P-20693A, Type IV. Has #6-32 stud behind panel.

DOUBLE ASSEMBLY TYPES



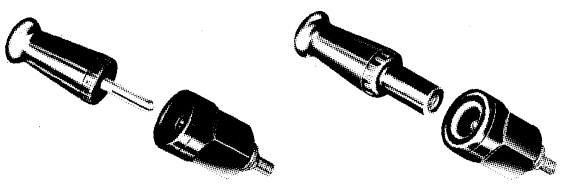
For instrument and equipment panels requiring binding posts mounted on 3/4" centers. Available in standard or miniature sizes. Construction and ratings same as for corresponding single types. Self-contained assembly makes mounting more accurate, faster and easier than two individual binding posts and gives maximum strength where connections are frequently made.

	STYLE	TYPE
Fluted Nut	#8-32 Stud	BP31*
Fluted Nut	#10-32 Stud	BP31-10*
Hex Nut	#8-32 Stud	BP30*
Hex Nut	#10-32 Stud	BP30-10*
Grounding	All Metal	BP30GP10
Fluted Nut	Miniature	BP21*
DOUBLE ASSEMBLY TYPE		
Standard	#8-32 Stud	BP30-2BR
Standard	#10-32 Stud	BP30-2BR10
Miniature	#6-32 Stud	BP21-2BR

*Indicate color desired: red, white, blue, black, yellow or green.

Supercon®

ELECTRICAL CONNECTORS



Nylon plastic parts; gold-plated brass current-carrying parts. Wiring connections to the same plug can be either soldered or solderless. Plug cable-fastening screws permit a wide range of cable sizes. Plug grips are of a simple, two-piece threaded construction for quick assembly. All receptacle plastic parts are molded of the same color to permit more rapid and accurate circuit identification front and back of panel when installed. The 25, 50 and 100 ampere types are listed by Underwriters' Laboratories, Inc. In red, black, white, blue, green or yellow.

5-way™

TEST PROBES

For test connections to PC boards and other electronic components. Design allows connections by hooking onto component leads or by plugging into Superior Electric 207146-001-JB terminals or others having 0.080" diameter receptacles. For plug-in, conductor holds firmly to inside of receptacle under spring tension. When used for hook-on, probe clamps to component lead or wire wrapping pin with approximately 16 oz. force. Conductor beryllium copper tempered to spring hardness. Insulating parts durable nylon plastic capable of withstanding 250°F without deforming. Available in red, black, white, blue, green or yellow.

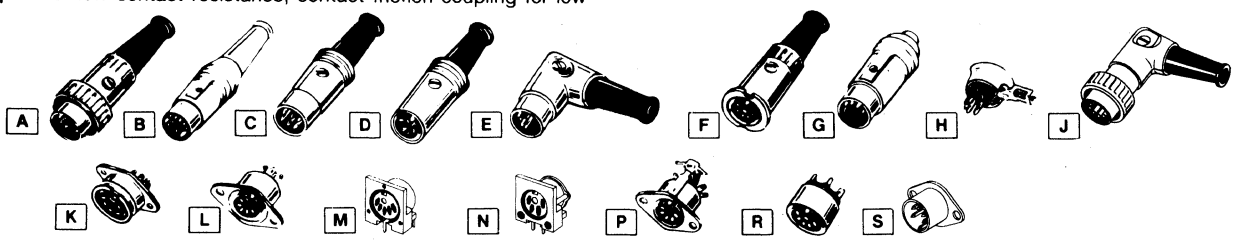
Superior Electric 383M Middle Street Bristol, Connecticut 06010 USA

TEL: (203) 582-9561 TELEX: 96-2446 TWX: 710-454-0682 Cable Address: SUPELEC FAX: (203) 584-1483

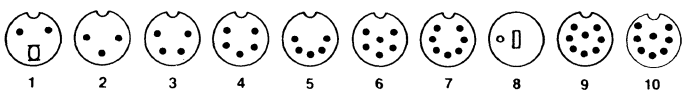
Switchcraft
A **Raytheon** Company

CIRCULAR DIN CONNECTORS

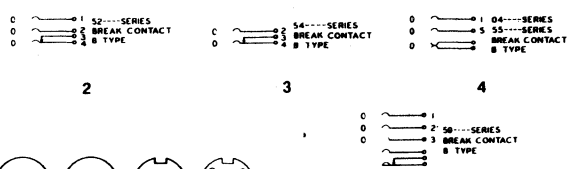
Designed for low level circuitry, for unlimited use in computer, commercial, industrial, consumer and military applications. Exact replacements for plugs and receptacles, used on most foreign built recorders, radios and dictation equipment. Also used extensively for computer keyboard, I/O and peripheral applications. "Switchcraft/DIN" 2 to 8 contact connectors include male and female plugs and receptacles with bright nickel-plated barrels & plastic snap-on shells. Lock-ring coupling, silver plated contact pins for low contact resistance, contact friction coupling for low mechanical interference noise, exclusive "automatic" grounding and polarization provisions. Full line of receptacles offer thru panel, PC board and surface mounting. Positioning "Ground Key-Rib" or "Ground Contact" — electrically integral with the connector shell — is provided in each plug and receptacle (except those with plastic housing or shells) to ground or shield the connector shell. Right angle PC board mount for common ground use also available.



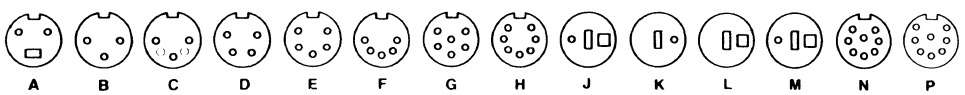
PIN ARRANGEMENTS



SCHEMATIC CIRCUITS



CONTACT ARRANGEMENTS

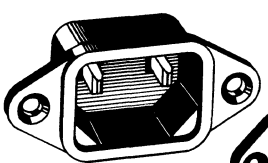


MOLDED CABLES WITH DIN PLUGS

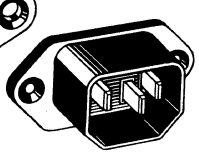
Switchcraft's versatile system of molded cable assemblies and mating receptacles meets the increased demand for modern, miniature connectors for a wide range of electrical/electronic applications. Connectors are DIN circular type and are fully field-proven in electronic applications. Strict requirements of FCC 20780 docket are fully addressed in offering fully shielded links.

The system comprises male and female plugs, locking and non-locking, with from 3 to 8 pins/contacts. Units are fully molded and protected with a rugged handle and advanced design cable relief. A complete range of mating receptacles is also available.

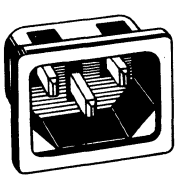
EUROPEAN AC RECEPTACLES



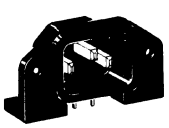
EAC-228
UL, CSA



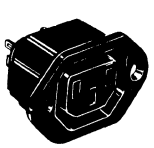
EAC-325
UL, CSA, VDE



No. EAC-409



EAC-303
UL, CSA, VDE



EAC-305,
EAC-306
UL, CSA, VDE

Part No. EAC-228 — 2-pin male receptacle with std. solder lugs. Mounts from front/rear of panel with 2, #5 screws or .125 in. (3.18 mm) dia. rivets (not supplied). 15 A, 250 V AC rated; UL & CSA listed. Mates with Switchcraft power cord Nos. P-2723 & P-2724.

Receptacles mate with European power plugs. Choose from panel/chassis or PC mount types. U.L. and C.S.A. listed types. Rating 6 A, 250 V AC or 15 A, 250 V AC. Nos. EAC-305 & EAC-309 are VDE approved. Contacts/Terminals: Brass, nickel sulfamate & electrotinned.

Part No. EAC-303 — Grounding type 3-pin male receptacle with right-angle housing and pins for PC board mtg. Ground lug (solder type) also supplied. .136 in. (3.45 mm) dia. housing holes also permit panel/chassis mount. 6 A, 250 V AC rating: U.L. & C.S.A. listed. Same rear mount as No. EAC-309. Pin terminals silver-plated brass. Mates with Switchcraft power cord Nos. P-2722, P-2725, P-2727 & P-2728.

Part No. EAC-305 — Grounding type, 3-contact female receptacle. Rated: 6 A, 250 V AC: U.L. & C.S.A. listed. Front panel/chassis mount in 1.275 in. (32.39 mm) x 1.56 in. (39.62 mm) hole with 2, #5 screws or .125 in. (3.18 mm) rivets (not supplied). Mates with Switchcraft power cords Parts Nos. P-2721, P-2725; Belden SPH-388; or equiv. Contacts/terminals: brass.

No. EAC-306 — Similar to EAC-305, except 15 A, 250 V AC rating U.L. & C.S.A. listed.

Part No. EAC-309 — Grounding types, 3 pin male receptacle. 6 A, 250 V AC; U.L., C.S.A., VDE listed. Mates with Switchcraft power cords Nos. P-2392, P-2720, P-2721, P-2722, P-2725, P-2727, P-2728; Belden SPH-386; or equiv. Rear mounts in 1.201 in. (30.51 mm) x .875 in. (22.22 mm) hole or front mounts in 1.08 in. (27.43 mm) x .785 in. (19.94 mm) hole in chassis/panel with 2, #5 screws or .125 in. (3.18 mm) dia. rivets (not supplied). Longer grounding pin allows ground circuit to "make" before power circuit, and "break" after power circuit disconnects. Pins .045 in. (1.14 mm) x .157 in. (3.99 mm) and terminals: silver plated.

Part No. EAC-324 — 3-pin male receptacle with short solder lugs. Extended socket housing (mtg. flange on rear) provides more behind panel depth. Mounts with 2, #4 screws or .094 in. (2.38 mm) dia. rivets (not supplied) from front/rear of panel. 15 A, 250 V AC; UL & CSA listed. Mates with Switchcraft power cord Nos. P-2723 & P-2724.

Part No. EAC-325 — Similar to EAC-324, except female. Mates with Switchcraft power cord Nos. P-2721 & P-2725.

Part No. EAC—405 — Same as EAC-305, except "snap-in" mount.

Part No. EAC-409 — 3-pin male recep. with solder lug terms. Rated: 6 A, 250 V. "Snap-in" front panel mount.

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Switchcraft
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"Q-G" AUDIO CONNECTORS WITH COMPLETE GROUNDING PROVISIONS!

Switchcraft "Quick-Ground" connectors feature a separate "Ground-Terminal" electrically integral with connector shell. Ground continuity between mating plugs automatically accomplished through exclusive "Ground Contactors". Possible loss of insert screw is eliminated by new "Captive-Design" insert screw. Socket and pin assemblies utilize "wedge-action" to insure firm, reliable positioning in connector shell. Inserts are easily removable for wiring & soldering. High impact thermosetting plastic material insures long reliable insert assy. life. Female connectors have latch lock feature to hold connectors firmly together. Plugs and receptacle mechanically keyed for proper mating. "Q-G" (*) Series 3-, 4-, 5-, 6-, and 7-pin/contact connectors offer 4-, 5-, 6-, 7-, & 8-pin contact versatility when "Ground-Terminal" is used. Used interchangeably with Switchcraft QGP connectors (page 41): 3- and 4-contact (Amphenol 91-850 and Excellite 91-450 Series, and Cannon XLR-3, XLR-4): 5-contact (Cannon XLR-5 and Amphenol Excellite 91-450 Series).
Cord plug part no. suffix "L" indicates strain relief accepts cables from .25 in. (6.35 mm) to .328 in. (8.33 mm) dia.; other plugs accept cables up to .25 in. (6.35 mm) dia. (*) Number of insert contacts or pins must be specified to complete part number.
Part number with suffix "B" indicates cord plug with "Black-Velvet" black finish (minimizes glare and permits stable "through-connector" shielding). Suffix "D" indicates type with "FAS-DISCONNECT" detent feature. U.S. Patent 3,219,961; Canadian Patent No. 761,114 (June 13, 1967)

Specifications:

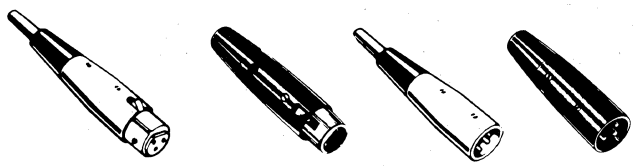
ELECTRICAL (QG Connectors Only)
Contact Resistance: 50 milliohm max., per pole
Current Rating: 3 pole-15 A; 4 pole-10 A, 5 & 6 pole—7.5 A; 7 pole-5 A at 125 Vac.
Insulation Resistance: 1,000 megohms, min.
Dielectric Withstanding Voltage: 1,000 V (rms)
Capacitance: 2 Pf between pins and 4 Pf between pins and shell, max. (A3M & A3F).

MECHANICAL (QG Connectors Only)
Insertion/Withdrawal Forces: 7 lb. max., 5 lb. nominal, insertion; 7 lb. max., 5 lb. nominal, withdrawal.

MATERIAL QG Connectors
Shell: Die-cast zinc. Satin nickel finish on all shells, except a black, electrically conductive, chrome plate finish on "Black-Velvet" shells.
Insert Insulation: High-impact, molded thermo-setting plastic.
Socket Contacts: Phosphor bronze, silver plated, chromate dipped; bifurcated on 3-contact type.
Pin Contacts: Brass, silver plated, chromate dipped, Resists tarnishing, and provides excellent electrical conductivity.
Latchlock: High-strength die-cast zinc.
Latch Release: Steel, nickel plated.
Latch Detent: Formed stainless steel.
Insert Screw: Stainless steel.
Cable Relief Bushing: Neoprene.
Mounting Nut and Washer: Brass, nickel plated. (Black, electrically conductive chrome plate finish for "Black Velvet" receptacles).
Mounting Wall Plates: Cold-rolled steel, with stainless steel finish.

QGP Connectors
Shell: Die-cast zinc, non-reflective Vel-Tone finish.
Insert Insulation: High strength, reinforced thermoset plastic.
Socket Contacts: Phosphor bronze, 50 microinch gold (over 50 microinch nickel) plated.
Pin Contact: Brass, 50 microinch gold (over 50 microinch nickel) plated.
Latchlock: Die-cast zinc, non-reflective nickel finish.
Latch Release: Steel, nickel plated.
Cable Relief Bushing: Flexible gray neoprene.
Barrel: (Female connectors only) Stainless steel.
Mounting Screws: Stainless steel, passivated, non-reflective finish.
Spanner Nut: (QGP-3-28) Die-cast zinc, nickel plated.
Nut: (QGP-3-29) Brass, nickel plated.
Washer: (QGP-3-29) Steel, nickel plated.

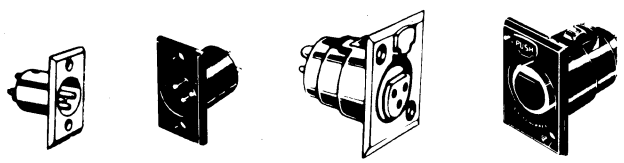
PLUGS



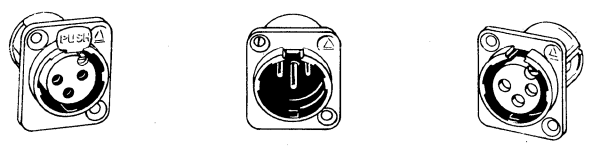
A(*)F A(*)FB A(*)M A(*)MB

RECEPTACLES

Series B(*)M Series B(*)MB Series B(*)F Series B(*)FB



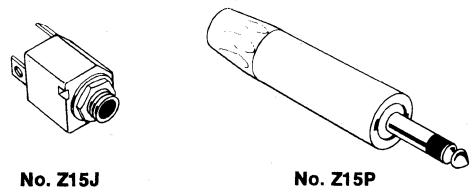
Series D(*)M Series D(*)MB Series D(*)F, D(*)FD Series D(*)FB



Series E (*) Fxx Series E (*) Mxx Series E (*) FDxx

Y3FD Y3FPC

HIGH POWER SPEAKER JACK AND PLUG



No. Z15J No. Z15P

FEATURES

- First .25 in. dia. plug to accept up to 10 AWG WIRE WITHOUT SOLDERED CONNECTION.
- 15 A continuous with 30°C heat rise.
- Collet strain relief provide positive cable retention.
- 10,000 insertion/withdrawal cycle (min.)
- Positive detent retains plug.
- RED jack housing & RED tip insulator indicates high power rating.
- Screwdriver or solder terminations.
- Plug accommodates cables up to .334 in. (8.7mm) dia. with cable clamp.

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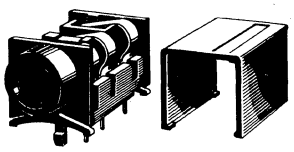


SN Jax

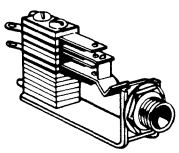
RIGHT ANGLE PHONE JACKS

2 & 3-cond., low profile right angle phone jacks snap into PC boards up to .062 in. thick. Jacks accept phone plugs with .25 in. dia. fingers. Location pin assures correct mounting, and molded housing protects internal parts and allows high density packaging. **Series SN37A** — .375 in. high, plastic non-threaded metal bushing. **Series SN49A** — .492 in. high, insulated non-threaded metal bushing. **Series SN49B** — .492 in. high, insulated threaded metal bushing. **Series SN49C** — .492 in. high, threaded metal bushing. **Series SN70B** — .708 in. high, insulated threaded metal bushing. **Series SN70C** — .708 in. high, threaded metal bushing.

Series SN37A[1]	Series SN49A[1]	Series SN49B[1]	Series SN49C	Series SN70B	Series SN70C	Description	Schematic[2]	Typical Mating Plug
SN37A-11	SN49A-11	SN49B-11	SN49C-11	SN70B-11	SN70C-11	2-cond. open circuit	I	250
SN37A-12A	SN49A-12A	SN49B-12A	SN49C-12A	SN70B-12A	SN70C-12A	2-cond. shunt on tip	III	
SN37A-12B	SN49A-12B	SN49B-12B	SN49C-12B	SN70B-12B	SN70C-12B	3-cond. double open circuit	IV	260
SN37A-14B	SN49A-14B	SN49B-14B	SN49C-14B	SN70B-14B	SN70C-14B	3-cond. double closed circuit	XII	

NOTES: [1] Series SN37A supplied with **Part No. P-2993** cover. Series SN49A and SN49B can be supplied with **Part No. P-2994** cover on special order. Contact Switchcraft.
[2] See Hi-D Jax page for schematics.

Series 30 — "LF-Jax" LONG FRAME JACKS



Long frame phone jacks have ground lug integral with frame. Welded fine silver cross bar contacts rated at 8 A, 125 V AC. Mounts in single .375 in. (9.52 mm) dia. hole in panels up to .25 in. (6.35 mm) thick. Mounting centers .625 in. (15.88 mm) min. Behind panel depth: 2.781 in. (70.64 mm). For non-turn mtg. device, prefix part no. with letter "R".

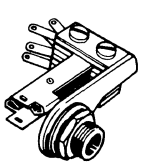
Part No.	Schematic No.	Typical Mating Plug	Cond.
★31	I	250	2
★32B	IV	267	3
★34B	XII	267	3
★36	XIV	267	3

NOTE: See Hi-D Jax page for schematics.
★ **Not stocked; contact Switchcraft.**

"SF-Jax" SHORT FRAME JACKS

Long spring design reliability with minimum behind-panel depth. Series 50 same as Series 20, except solder lug location necessitates more depth, but requires less panel space. No. C55B has MIL type insulation & finish.

SERIES 20



SERIES 50

Part No.	Cond.	Schematic No.	Typical Mating Plug	MIL Type	Contacts	Rating	Mounting In. (mm)
24B	3	XII	267	—	Fine silver	3 A 125 V AC	.375 (9.52) hole, mounts in panels up to .156 (3.96) thick.
25	2	XIII	250	—			
★ 53B	3	VII	267	—			
54A	2	XI	250	—			
★ 54B	3	XII	267	—			
★ 55	2	XIII	250	—			
★C-55B	3	XV	482	JJ-095, M641/14-1			

NOTE: See Hi-D Jax page for schematics.
★ **Not stocked; contact Switchcraft.**

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Switchcraft
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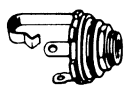
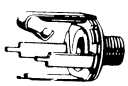
Littel-Jax PHONE JACKS

Quality phone jacks that mate with standard .25 in. (6.35 mm) or .21 in. (5.33 mm) phone plugs. Notched insulating washers mechanically interlock springs and solder lugs. "V" bend in tip spring firmly holds mating plug. Minimum space requirements. Mounts in single .375 in. (9.52 mm) hole, panels up to .156 in. (3.96 mm) thick, except L-11 and L-12A in panels up to .25 in. (6.35 mm) thick. PC-12A; std. .25 in. (6.35 mm) dia. bushing.

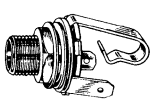
Littel-Jax PHONE JACKS with QUICK CONNECT TERMINALS. Littel-Jax jacks, Nos. FA-11 & FAL-11 with quick connect terminals accept AMP FASTON* 205 Series receptacles. Mounts in .375 in. (9.52 mm) dia. holes on 1.375 in. (34.92 mm) centers (min.) Locknut and washer supplied. *Trademark of AMP INC.



C-11



PC-12A



FA-11

TWO CONDUCTOR TYPES

Part No.	Schematic No.	Typical Mating Plug	MIL-Type	Description
11	I	250	—	Open circuit
C-11	I	440,445, 470[1]	MIL Type JJ-034, Part No. M641/6-1	With locating pin (non-turn device)
FA-11	I	250	—	AMP FASTON 205 Series. Quick connect terminals.
FAL-11	I	250	—	.375 in. (9.52 mm) lg. bushing. Quick connect terminals.
L-11	I	250	—	.375 in. (9.52 mm) lg. bushing
S-11	I	S-250	—	.210 in. (5.33 mm) I.D. bushing
12A	III	250	—	Tip shunt
C-12A	III	440, 445, 470[1]	MIL Type JJ-089, Part No. M641/12-1	—
L-12A	III	250	—	.375 in. (9.52 mm) lg. bushing
S-12A	III	S-250	—	.210 in. (5.33 mm) I.D. bushing
PC-12A	III	250	—	P.C. board mtg.
13	V	250	—	Isolated "make" circuit
13A	VI	250	—	Transfer circuit
13E	IX	250	—	Isolated "break" circuit

NOTE: [1] Mating Plugs — PJ-055B, M642/4-1; PJ-055R, M642/4-2; PJ-055M, 642/4-3.

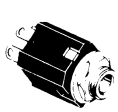
THREE CONDUCTOR TYPES

12B	IV	267	—	Double open circuit
C-12B	IV	480 (PJ-068, M642/5-1)	MIL Type JJ-033, Part No. M641/5-1	—
L-12B	IV	267	—	.375 in. (9.52 mm) lg. bushing
S-12B	IV	480 (PJ-068, M642/5-1)	—	.21 in. (5.33 mm) I.D. bushing
13B	VII	267	—	Tip shunt
S-13B	VII	480 (PJ-068, M642/5-1)	—	.21 in. (5.33 mm) I.D. bushing
14B	XII	267	—	Double closed circuit

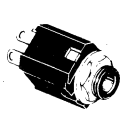
Hi-D Jax ENCLOSED PHONE JACKS

Series 110: Smaller, compact phone jacks mate with std. .25 in. (6.35 mm) phone plugs. Molded body protects integral silver-plated springs. Low contact resistance; low electrical leakage and low capacity between springs. Mounts on .625 in. (15.88 mm) center in single .375 in. (9.52 mm) hole in panels up to .156 in. (3.96 mm) thick, depth behind panel 1.094 in. (27.79 mm). All jacks with "M" prefix designed and adjusted to mate with telephone and MIL-std. plugs. Jacks with PC terms, mount to single, double-sided and multilayer boards up to .094 in. (2.39 mm) thick. Standoff shoulders; mounting hardware supplied.

Series RN-110: Right angle jack, saves mounting space on PC boards for commercial and telephone/MIL applications. Available in 2- and 3-cond. types with or without shunt circuits; all mate with .25 in. (6.35 mm) dia. COMMERCIAL or TELEPHONE/MIL plug finger configurations. Right angle jack permits tip of mating plug to be inserted parallel with PC board. Can be mtd. on PC boards, combined PC board and panel/chassis, or panel/chassis only. Jack bushing mounts through .375 in. (9.52 mm) dia. hole in panels or chassis up to .141 in. (3.58 mm) thick. Mtg. centers .625 in. (15.88 mm) min. Washer & locknut supplied.



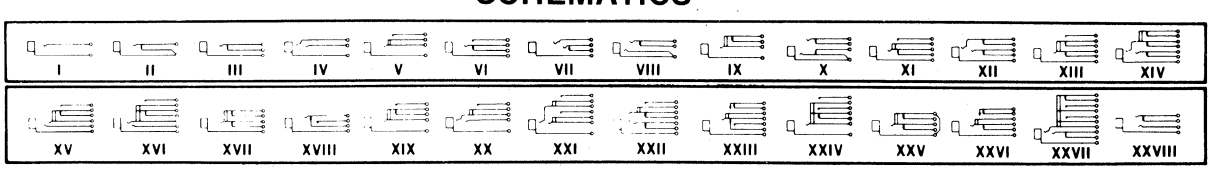
SERIES 110



SERIES N-110

SERIES RN-110

SCHEMATICS



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Switchcraft

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"Tini-D Jax" MINIATURE ENCLOSED PHONE JACKS

PC-142A

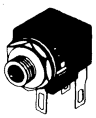
Small, completely enclosed 2-cond. molded phone jack. Phenolic housing protects bifurcated beryllium copper springs from bending during mounting. Mounts on .375 in. (9.52 mm) centers in .25 in. (6.35 mm) dia. hole in panels up to .125 in. (3.18 mm) thick. Depth behind panel .625 in. (15.88 mm).

Part No.	Description	Schematic No.	Typical Mating Plug
142A	Bushing mount	III	750
PC-142A	PC board mount[1]		

NOTE: [1] Threaded bushing for conventional mounting and special spring terminals that "snap-in" PC boards up to .125 in. (3.18 mm) thick.

"Micro-D Jax" SUBMINIATURE ENCLOSED PHONE JACK

MDSL-2A



MDSL-2A-RA

MDPC-2A

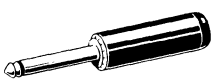
"Super-small," shunted, fully enclosed jack — only .312 in. (7.92 mm) x .344 in. (8.74 mm) x .688 in. (17.48 mm). 1-piece molded body locks all internal parts in place. Mates with Switchcraft Micro-Plug phone plugs. PC terminals have standoff shoulders. Nos. MDSL-2A & MDSL-2A-RA have #10-48 threaded bushing; mounting washer & locknut supplied.

MDPC-2A-RA

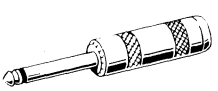
Part No.	Schematic No.	Typical Mating Plug	Cond.	Terminals	Mounting In. (mm)
MDSL-2A	III	850, 851	2	Solder lug	Mounts thru .203 (5.16) hole, in panels up to .063 (1.6) thick. Singly or in rows on .350 (8.89) min. centers. Adjacent sleeves touch when mtd. on .315 (8.00) centers.
MDPC-2A	III	850	2	PC	Mounts singly or in rows on .315 (8.00) min. centers or .350 (8.89) min. centers
MDSL-2A-RA	III	850, 851	2	Solder lug	Same as Part No. MDSL-2A except right angle solder lug terms. for min. space. Behind panel clearance .382 (9.70)
MDPC-2A-RA	III	850	2	PC	Same as Part No. MDPC-2A except right angle PC terms. Above PC board clearance .345 (8.76)

Littel-Plug PHONE PLUGS

Phone plugs fit std. .25 in. (6.35 mm) phone jacks. Solder terminal plugs have built-in cable clamp. Shielded metal handles are nickel-plated brass or durable molded plastic: 1.688 in. (42.88 mm) long x .5 in. (12.7 mm) dia. Max. cable dia.: 2.97 in. (7.54 mm).



No. 250



No. 280

THREE CONDUCTOR

260	Screw terminals, black handle.	12B
S-260	Screw terminals, black handle, .206 in. (5.23 mm) dia. sleeve & tip.	S-12B
267	Combination cable clamp & solder lugs, black handle.	12B
269	Same as 267 except red handle.	12B
290	Screw terminals, shielded handle.	12B
297	Same as 267 except shielded handle.	12B

TWO CONDUCTOR

Part No.	Description	Typical Mating Littel-Jax Jacks
240	Screw terminals, black handle.	11
C-240	Screw terminals with integral cord clamp, black handle.	11
245	Screw terminals, red handle.	11
C-245	Same as C-240 except red handle.	11
250	Solder lugs, black handle.	11
255	Solder lugs, red handle	11
270	Screw terminals, shielded handle.	11
C-270	Same as C-240 except shielded handle.	11
280	Solder lugs, shielded handle.	11
288	Special shielded type. Wide insulator between tip-sleeve; use in 3-cond. jack to perform a 2-cond. function without shorting.	11
S-250	Solder lugs, black handle, .206 in. (5.23 mm) dia. sleeve and tip.	S-11
S-280	Same as S-250 except shielded handle.	S-11

3501F

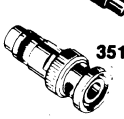
3501MC

3501FR

3502

3503

3558



3513

3511, 3511A
3512, 3512A

PHONO JACKS AND PLUGS

Low cost 2-cond. jacks and plugs for record players, FM-AM tuners, tape recorders, test equipment, etc. 3501MC has .375 in. (9.52 mm) O.D. shell and cable clamp. 3501FP for front panel mount in .25 in. (6.35 mm) hole in panels up to .125 in. (3.18 mm) thick. 3501FR for rear panel mount in .375 in. (9.52 mm) hole in panels up to .203 in. (5.16 mm) thick. 3502 has unique cable clamp with .406 in. (10.31 mm) O.D. shielded removable handle. 3503 extension jack has shielded removable handle .406 in. (10.31 mm) O.D. with cable clamp.

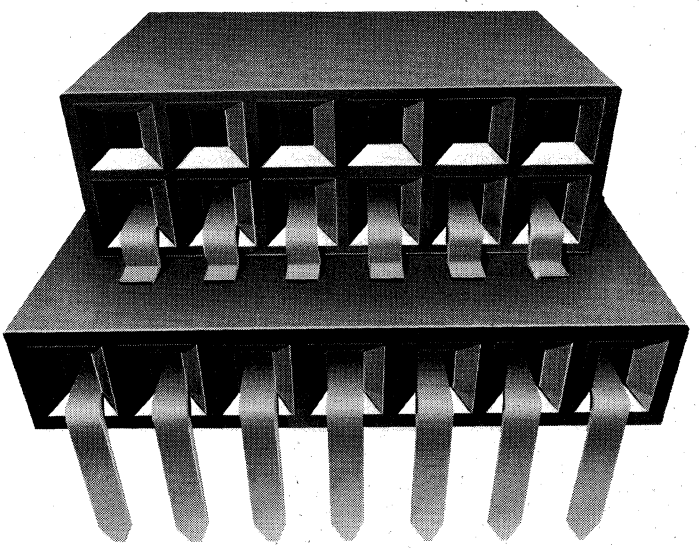
Series 3558 are phono plugs with cable clamp and "snap-on" color-coded plastic handles in red, black and white.

Series 3511, 4 Leaf Clover Jax, molded phono Jack with dual contact surfaces for low shunt resistance. Open and closed circuit types. Mates with all Switchcraft phono plugs.

Part No.	Description
3501F	Phono jack
3501M	Plug, less cable clamp
3501MC	Plug with cable clamp
3501FP	—
3501FR	Phono jack
3502	Plug
3503	Extension Plug
3558-1	Plug, red handle
3558-2	Plug, black handle
3558-5	Plug, white handle
3511	Phono jack, open circuit
3511A	Phono jack, open circuit grounded
3512	Phono jack, closed circuit
3512A	Phono jack, closed circuit grounded
3513	Phono Jack-to-BNC Connector Adapter

Switchcraft, Inc., 5555 N. Elston Ave., Chicago, IL 60630 Tel. (312) 792-2700 TWX 910 221 5199 FAX (312) 792-2129

KNOCKOUTS



The TKO™ PCB Connector Series

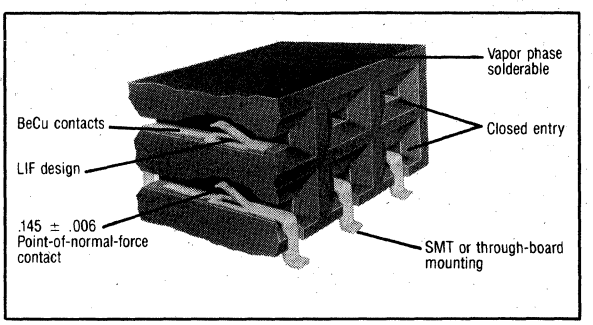
HIGH PERFORMANCE AND LOW COST

COMPARE TKO™ FEATURES

See for yourself. TKO outscores the competition and even Teka's own standard "Taper Box" Connector in every category.

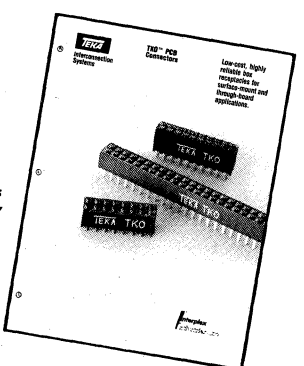
Specification	Teka TKO	Teka Taper Box	Competitor
Cycles	200 min.	100 min.	
Point of Wipe	.145"	.160"	
BeCu Contact	Standard	Optional	
High Temp Plastic	Standard	Not Avail.	
Low Profile Height	Available	Not Avail.	
SMT Configuration	Available	Not Avail.	
Solder Bearing Leads	Available	Not Avail.	
Top or Bottom Entry (vertical style)	Optional	Top Only	
UL Approved	Yes	Yes	
LIF Design	Yes	No	
Cost	Low	Moderate	

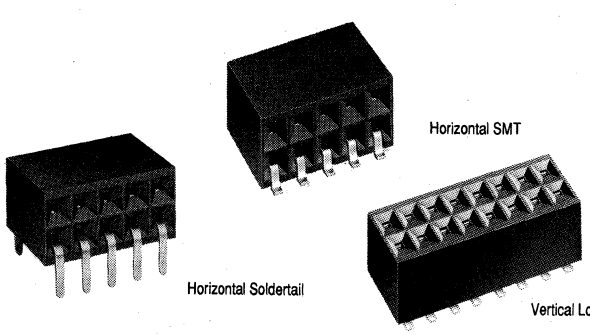
TKO is a proven receptacle series that is currently in use throughout the industry in a wide variety of applications. For information and technical assistance re: your application, please contact Teka Customer Service.



Quality features in a low-cost design.

Call for a catalog or samples and the location of your nearest representative. Call (401) 785-4110.





TEKA
an Interplex Industries company

INTERCONNECTION SYSTEMS, INC.

45 Salem Street
Providence, RI 02907-2888
(401) 785-4110
TWX: 710-381-1606
FAX: (401) 461-2310

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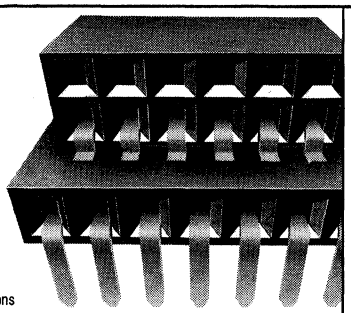
TEKA TKO

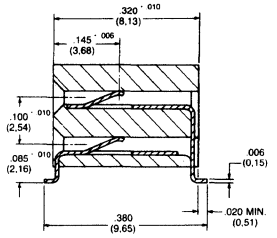
PCB Connectors
SMT or Soldertail

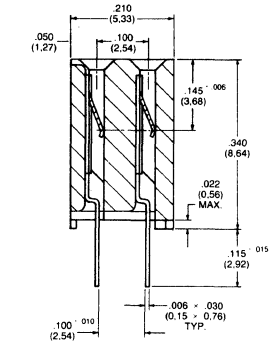


General Information
- Design provides low cost, highly reliable interconnection
- Ideal for mother/daughter board interconnections
- Mates with both .025 square or round pins
- Vertical or horizontal configurations
- Single or Double row

Features
- Surface mount and solder tail configurations
- Designed for use with double-sided and multilayered PCB's
- High-temp. plastic allows infra-red and vapor phase soldering
- .145 ± .006 point-of-normal-force contact
- Low insertion force design
- BeCu contacts
- Selective gold plating
- Standoffs
- Packaging for robotic assembly available

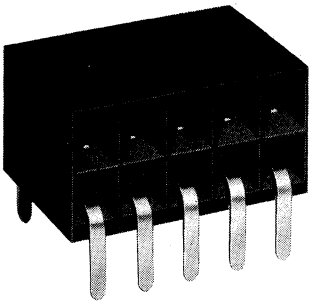
Technical Data
- Current rating = 3 amp (maximum)
- Dielectric withstanding voltage = 1000 VAC RMS (minimum)
- Insulation resistance = 10,000 megaohms (minimum)
- Contact resistance = 30 milliohms (maximum)
- Contact retention = 2 lbs. (minimum)
- Durability = 200 mating cycles (minimum)
- Temperature ranges = −65 degrees celsius to +125 degrees celsius
- Mating force: = 4 oz./contact (maximum)





TEKA TAPER BOX

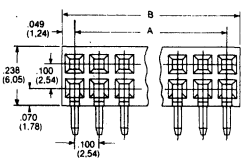
PCB Connectors
.100"&.150" Centerlines

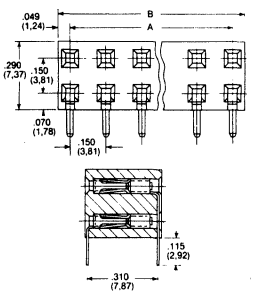


General Information
- Patented design features centering action to position male header pins for optimum contact redundancy
- Four-sided contacts are tapered to avoid off-center pin alignment.
- Design provides highly reliable performance under high vibration conditions
- Interchangeable with connectors of similar type
- Ideal for mother/daughter board interconnections

Features
- .160" ± .006" point-of-normal-force contact
- Copper alloy contacts with selective gold plating
- Standoffs
- Mates with .025" square or round pins
- Single and double row, vertical and horizontal configurations

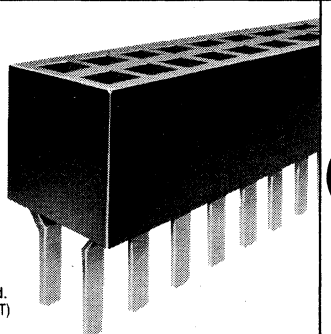
Technical Data
- Current rating = 3 amps
- Dielectric withstanding voltage at sea level:
  1250 VRMS (.100" centers)
  1500 VRMS (.150" centers)
- Insulation resistance = 5,000 megaohms (min.)
- Contact resistance = 15 milliohms (max..)
- Insertion force = 5 oz. max. per contact
- Withdrawal force = 2 0z. min. per contact
- Normal force = 2 oz. min. per contact point
- Operating Temperature = -65°C to +125°C
- Housing: glass-filled polyester
- UL approval





TEKA LOW PROFILE

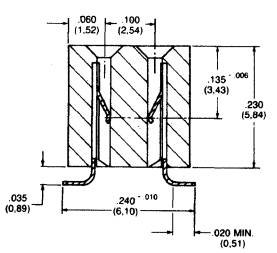
Vertical PCB Connectors

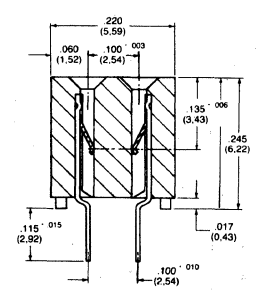


General Information
- For use where space between PC boards is limited.
- Above board height: .245" (solder tail). 265" (SMT)
- Design provides low cost, highly reliable interconnection
- Ideal for mother/daughter board interconnections
- Mates with both .025 square or round pins
- Single or double row

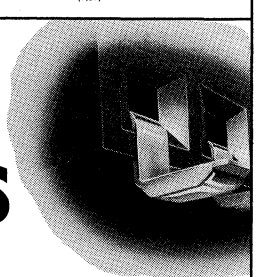
Features
- Surface mount and solder tail configurations
- Designed for use with double-sided and multilayered PCB's
- High-temp. plastic allows infra-red and vapor phase soldering
- .145 ± .006 point-of-normal-force contact
- Low insertion force design
- BeCu contacts
- Selective gold plating
- Standoffs
- Packaging for robotic assembly available

Technical Data
- Current rating = 3 amp (maximum)
- Dielectric withstanding voltage = 1000 VAC RMS (minimum)
- Insulation resistance = 10,000 megaohms (minimum)
- Contact resistance = 30 milliohms (maximum)
- Contact retention = 2 lbs. (minimum)
- Durability = 200 mating cycles (minimum)
- Temperature ranges = −65 degrees celsius to +125 degrees celsius
- Mating force: = 4 oz./contact (maximum)





TEKA SBL-SMT CONNECTORS

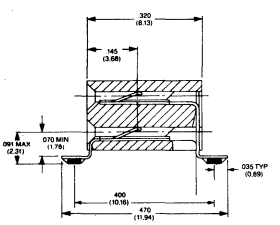


Solder-bearing Lead
Surface Mount PCB Connectors

General Information

Teka introduces the *SBL (solder-bearing lead) Connectors*, a new generation of two-piece SMT connectors designed to virtually eliminate rework on PCB's due to connector solder-joint problems.

The patented design features a precise amount of flux core solder, attached to each contact leg, assuring confidence of solder-joint integrity using vapor reflow and infrared processes. This design advance was made possible by a precision tamping process developed by Interplex Industries.



Features
- Interchangeable with connectors of similar design
- .145 ± .006 Point-of-normal-force contact
- .100 centerline spacing
- Mates with .025 square or round pin
- BeCu contacts with selective gold plating
- Low insertion force design
- Vapor phase solderable: Rynite housing
- Approvals: UL

Technical Data
- Current rating = 3 amp (maximum
- Dielectric withstanding voltage = 1000 VAC RMS (minimum)
- Insulation resistance = 10,000 megohms (minimum)
- Durability = 200 mating cycles (minimum)
- Temperature ranges = −65C to +125C
- Mating force: = 4 oz./contact (maximum)

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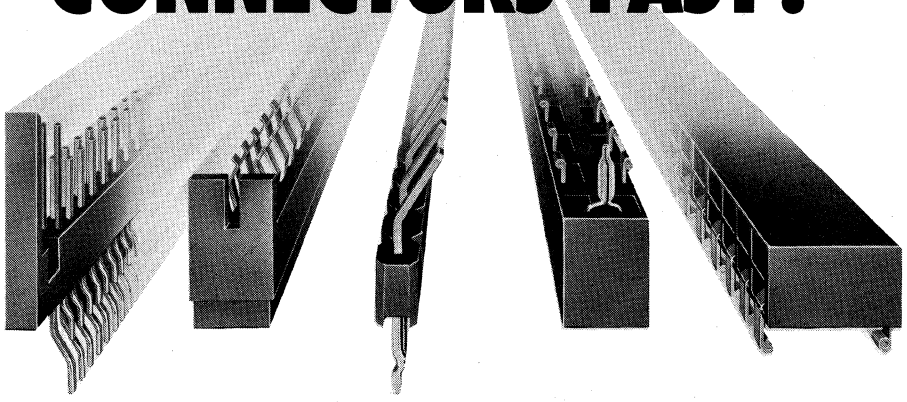
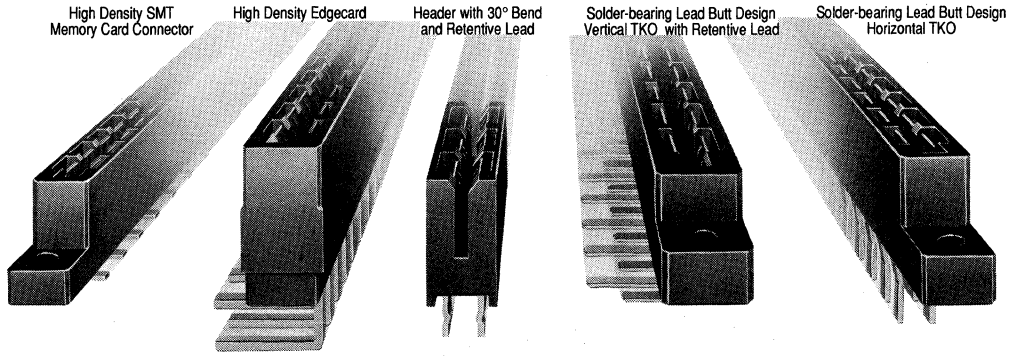
NEED SPECIAL OR CUSTOM CONNECTORS FAST?

Custom Examples (enlarged):



High Density SMT Memory Card Connector | High Density Edgecard | Header with 30° Bend and Retentive Lead | Solder-bearing Lead Butt Design Vertical TKO with Retentive Lead | Solder-bearing Lead Butt Design Horizontal TKO

Edgecard Special Examples:



Surface-mount Edgecard | Right Angle Edgecard with Even Tails | 3 Position Edgecard with Retentive Leads | Right Angle Edgecard .156" Spacing with Uneven Tails | Edgecard with 062" Card Extender

CALL TEKA.

YOUR PROBLEM IS THAT...
most connector companies are not organized to effectively respond to the demanding needs of the custom connector business. Fast-paced development and production schedules require extremely tight coordination of the manufacturing process, while the reliability of the end-product remains critical.

YOUR SINGLE SOURCE
You need only make one call... Teka Interconnection Systems. We provide all the expertise you need *right in-house* — including connector design, tooling, molding, stamping, plating, assembly and testing. Applying the same advanced engineering skills and technology that built the broad line of quality Teka PCB connectors.

SOLVING PCB CONNECTOR PROBLEMS
Teka harnesses the resources and experience within the entire group of Interplex Industries companies, and puts it to work for you. Your project benefits through increased cost-efficiency and faster turnaround.

CALL US TODAY !
End your search for custom and modified standard PCB connectors right here.

Call Teka Interconnection Systems at (401) 785-4110. We have representatives nation-wide, ready to assist you.

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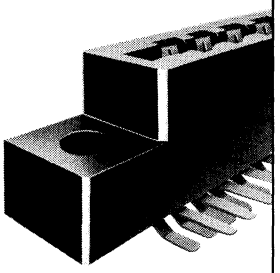
TEKA SPECIAL EDGECARD

High Reliability



General Information

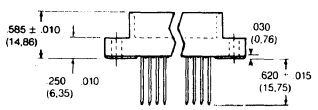
- Modified to fit your requirements
- Spacing: .100, .125 and .156"
- Flush mount or center mount
- Variety of tail configurations:
  - External PCB retention tail
  - Card extender
  - Wire wrap
  - DIP solder
  - Right angle-flush
  - Right angle-uneven
- 2 x 52 PC edgecard available

Features

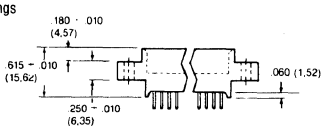
- High reliability pre-loaded bifurcated simple cantilever contact design
- Mates with .054" to .071" PC boards
- With or without mounting ears, threaded bushings or inserts
- Polarization keys: in-contact, in-between
- Shorting contacts
- Standoffs
- Selective plating

Technical Data

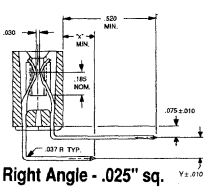
- Insulation Resistance: 5000 megohms min.
- Capacitance (picofarads): 2 max.
- Operating Temperature: – 65° to + 125° C
- Insertion Force: 16 oz. max. per contact pair
- Withdrawal Force: 1 oz. min. per contact pair
- Life: 500 cycles min.
- Normal Forces: 150 grams min. (.062 PCB)
- Housing: Glass-Filled Thermo-Plastic
  - Polyester UL 94 V-O
- Contact: CA510 Phosphor Bronze
  - CA 172 Beryllium Copper (Soldertail only)
  - CA725 Alloy Copper Nickel
- Floating Bushings: Brass, nickel plated (standard)
- Threaded Inserts: Brass, nickel plated (standard
- *Tin alloy: – 40° C to + 105° C
- **For high temperature material consult factory.



Wire Wrap - .025" sq.



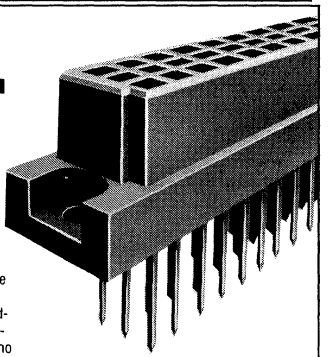
DIP Solder



Right Angle - .025" sq.

TEKA LOW-COST DIN

Styles C & R



General Information:

The Teka Econo DIN series is an economical alternative to existing female DIN connectors. The patented one piece dual-beam contact design offers a reliable board-to-board interconnection with optimum contact redundancy, without compromising performance. Teka Econo DIN meets the requirements of the 41612 specification.

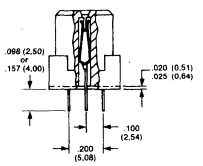
This design advance was made possible by a precision stamping process developed by Teka parent company, Interplex Industries Inc.

Features

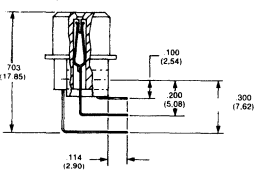
- Low cost/high performance design
- Density: up to 96 contacts in 3 rows
- Mounting: standard and inverse
- Contacts, female: self centering, pre-loaded
- Tails: DIP solder or compliant
- Housings: chamfered lead-ins
- Plating: selective gold on contact area, tin alloy tails
- Specifications: conforms to DIN 41612 styles C & R

Technical Data

- Operating Voltage: 300 VRMS
- Current (Max): 3 amps per contact
- Contact Resistance: 20 Milliohms (max)
- Dielectric Strength: 1000 V
- Insulation Resistance: 10^{12} Ohms
- Operating Temperature: – 55° C to + 125° C
- UL Flammability: 94 V-O
- Insertion Force: Style C, 20.2 pounds max. (96 positions)
- Withdrawal Force: Style C, 3.24 pounds min. (96 positions)
- Contacts: Phospor Bronze
- Housing: Glass filled polyester



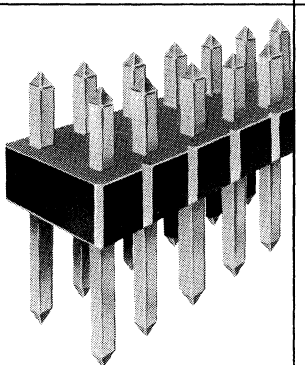
Style C - Standard



Style R - Inverse

TEKA HI-TEMP HEADERS

Standard .025" Square Posts
.100" x .100" Matrix



General Information

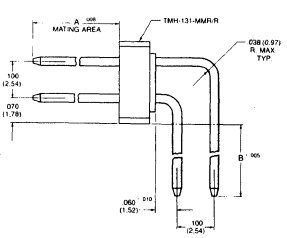
- Single & dual row, vertical and right angle configurations
- Single row available in 1x36 position double row available in 2x36 position
- .100" centerline spacing; double row headers are on .100" x .100" grid
- Low cost I/O interconnection
- Standard mating pin lengths are .230" and .318"
- Stackable end-to-end
- Consult factory for optional pin lengths and plating

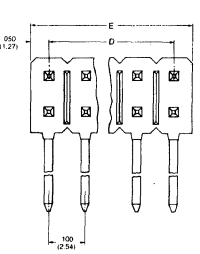
Features

- High temperature plastic allows infra-red and vapor phase soldering.
- Standoffs permit cleaning of soldering contaminates.
- Barb feature provides improved retention.
- Drawn wire pins provide smooth contact surfaces on all sides.
- Selective gold plating available.

Technical Data

- Current rating = 5 amps (maximum).
- Dielectric withstanding = 7500 VAC RMS (minimum).
- Insulation resistance = 10,000 megaohms (minimum).
- Operating temperatures = 600 VDC (sea level).
- Contact retention = 4 lbs. (minimum).
- Contact = copper alloy
- Insulator body = thermoplastic PET, UL flammability rating 94 VO.



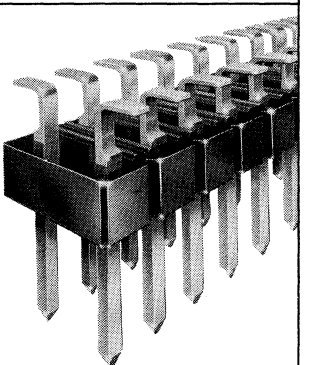


Test Data

Specifications, prints and samples are available upon request from Teka Customer Service.

TEKA SMT HEADERS

Single and Double Row



General Information

- Single row available in 1x36 position double row available in 2x36 position
- .100" centerline spacing; double row headers are on .100" x .100" grid
- Standard mating pin lengths are .230" and .318"
- Stackable end-to-end
- Consult factory for optional pin lengths and plating

Features

- High temperature plastic allows infra-red and vapor phase soldering.
- Barb feature provides improved retention.
- Drawn wire pins provide smooth contact surfaces on all sides.
- Selective gold plating available.

Technical Data

- Current rating = 5 amps (maximum).
- Dielectric withstanding = 7500 VAC RMS (minimum).
- Insulation resistance = 10,000 megaohms (minimum).
- Operating temperatures = 600 VDC (sea level).
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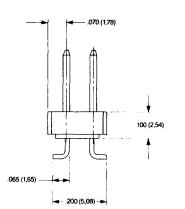

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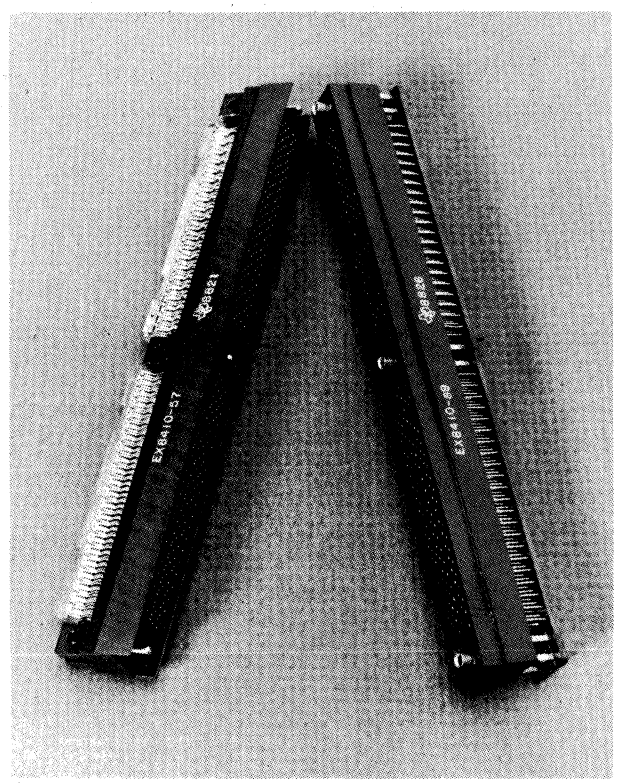
FAX: (401) 461-2310

UHD, ULTRA HIGH DENSITY TWO-PIECE, SMT, MILITARY CONNECTOR

More programs have begun to use surface mount packaging techniques in order to save space and weight. The choice of connectors available to implement these designs is limited.

A major effort in the connector industry has been to develop a connector for the 3/4 ATR (size 6) line replaceable module (LRM).TI's Micro Electronics Packaging Department of the Defense Systems and Electronics Group and TI's Connector Systems Department have jointly developed the UHD family of surface mount connectors for LRM applications, The UHD connector is sized for the 3/4 ATR card. Optimum sizing provides a maximum of 344 contacts. The basic connector is of molded construction and is adaptable to fiber optic or coax contacts. It is designed to provide minimum card spacing where pin shielding is not required. A metal shell version is available. The uniquely designed motherboard (receptacle) connector utilizes an integral termination "organizer" and provides for plus or minus .020" lateral float with minimum force during the thermal clamping cycle. This insures intimate surface contact at the chassis to card interface. UHD production is fully available. Second sources are being secured at this time. The connector is available in half-length sizes with 172, 128, or 84 pins and full length sizes with 344, 256, or 168 pins.



DESIGN FEATURES

- 3 amp current rating.
- Maximum of 344 high reliability screw machine contacts.
- Selective loading for optimum flexibility.
- 2 oz. average mating force contacts.
- Full and half size versions.
- Stackable on .500 inch centers.
- Designed to meet MIL-C-55302 requirements.
- Standard MIL-C-55302 hardware for 1000 keying positions.
- Surface mount daughtercard with alignment tooling availability.
- Thru hole motherboard mounting with integral lead organizer.
- High performance Ryton insulator material.
- Compatible with vapor phase reflow (+230°C).
- .020" lateral adjustment capability.

ADDITONAL FEATURES

- Metal shells
- Interfacial seal
- Fiber optics
- Coax contacts

For more information about this family of connectors, contact:
Texas Instruments Incorported
CSD Marketing, MS 14-3
Attleboro, Massachusetts 02703
Tel.: (508) 699-3800, Ext. 5234, 5370, 5338, 5242

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TEXAS INSTRUMENTS
34 Forest Street • Attleboro, Massachusetts 02703

TWO-PIECE MILITARY CONNECTOR PRODUCTS .075" CENTERLINE X .0375" OFFSET STRAIGHT AND RIGHT ANGLE PLUGS, STRAIGHT RECEPTACLES

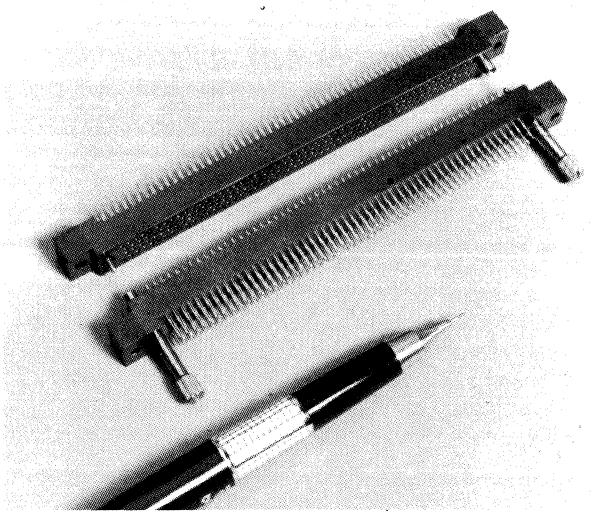
An increasing number of new programs are being designed which exceed the traditional .100" centerline product offerings. Also, mature programs are being redesigned which will require increased I/O capability in the same or less available space.

In order to meet the needs of today's designer, Texas Instruments has a new .075" centerline military connector series.

The wide selection of body styles, contact designs, assembly hardware, selective loading, and special variations available provides maximum flexibility.

The MIL-C 55302 qualification has begun and slash sheet approval is expected in mid-1989.

Samples, specifications, and design assistance are available now.



DESIGN FEATURES

A. Materials and Finishes
   1. Contact area:
      a. Beryllium copper per QQ-C-530, base material.
      b. Gold plate, 50 microinch minimum, per MIL-G-45204-Type II, Grade C, Class I, over nickel in contact engagement area, 20 microinch min. on termination. Selective plating options available.
   2. Insulator: Polyphenylene sulfide molding compound - per MIL-C-55302.
   3. Hardware: Stainless steel or non-corroding alloy per MIL-C-55302.

B. Performance:
   1. Contact rating: 3 ampere.
   2. Test voltage:
      750 Vrms at sea level
      250 Vrms at 70,000 ft. altitude
   3. Oversize pin exclusion: .033 diameter test pin, 21 oz. force.
   4. Insulation resistance: 4500 Megohms min. at 500 VDC
   5. Durability: 500 mating - unmating cycles.
   6. Contact resistance: .010 ohms max. avg., .020 ohms individual max.
   7. Insertion/withdrawal forces for socket contacts: 2.0 ounce typical insertion force; 0.5 ounce minimum withdrawal.

For more information contact:
Texas Instruments Incorporated
Military Connector Marketing, MS14-3
Attleboro, Massachusetts 02703
Tel.: (508) 699-3800, Ext. 5211, 5234, 5302, 5303

PART NUMBER SYSTEM

80 pos. Recept 80 pos. R/A plug 80 pos St. plug	3 Row - .075" ℄	AAA 080 XXXX XXXX A00 AAB 080 XXXX XXXX A00 AAC 080 XXXX XXXX A00
100 pos. Recep. 100 pos. R/A plug	2 Row - .075" ℄	AAD 100 XXXX XXXX A00 AAE 100 XXXX XXXX A00
122 pos. Recept. 122 pos. R/A plug 122 pos. St. Plug	3 Row - .075" ℄	AAA 122 XXXX XXXX A00 AAB 122 XXXX XXXX A00 AAC 122 XXXX XXXX A00
152 pos. Recept. 152 pos. R/A plug 152 pos. St. plug	3 Row - .075" ℄	AAA 152 XXXX XXXX A00 AAB 152 XXXX XXXX A00 AAC 152 XXXX XXXX A00
206 pos. Recept. 206 pos. R/A plug 206 pos St. plug	3 Row - .075" ℄	AAA 206 XXXX XXXX A00 AAB 206 XXXX XXXX A00 AAC 206 XXXX XXXX A00
210 pos. Recept. 210 pos. R/A plug 210 pos. St. plug	4 Row - .075" ℄	AAH 210 XXXX XXXX A00 AAJ 210 XXXX XXXX A00 AAK 210 XXXX XXXX A00

Special Variation Number

Hardware Code

	2 Row/3Row	4 Row
Guide Set	A003	A006
Fixed Jack Set	A010	A005
Turning Jack Set - .490" length - slotted screw	A001	A008
Turning Jack Set - .700" length - slotted screw	A011	A004

Contact Type Code

Length	Straight Receptacle		Right Angle Plug			Straight Plug	
	2 Row/3 Row	4 Row	2 Row	3 Row	4 Row	2 Row/3 Row	4 Row
.109"	A001	A024	A017	A005	A028	A008	A031
.140"	A002	A025	A018	A006	A029	A009	A032
.172"	A003	A026	A019	A007	A030	A010	A033
.234"	A014	A020	-	-	-	-	-
Solder Cup	A004	-	-	-	-	A011	-
Wire Wrap	A015	A021	-	-	-	-	-

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TEXAS INSTRUMENTS
34 Forest Street • Attleboro, Massachusetts 02703

F SERIES
MIL-C-55302 2 PIECE PRINTED WIRING BOARD CONNECTORS

Texas Instruments offers the F-Series MIL-C-55302 qualified, 2-piece PWB Connectors for use in high reliability electronic systems. These products offer .100" contact centerlines with a wide variety of body styles and hardware types to match your interconnection needs. Cable temination style products are also available. F-Series is a leading interconnection system used in airborne and ground based systems.

The F-Series encompasses products qualified to MIL-C-55302 on the following slash sheets: /21, /22, /55, /56, /57, /58, /59, /60, /61, /62, /62, /63, /64, /65, /66, /138, /139.

F-SERIES PRODUCTS

10-70 Position (2 Rows)
- Straight plugs
- Right angle plugs
- Straight receptacles
- Right angle receptacles
- 15 sizes available

50-160 Position (3 Row)
- Straight receptacles
- Right angle plugs
- 7 sizes available

90, 100, 120 Position (2 Row)
- Straight receptacles
- Right angle plug
- 3 sizes available

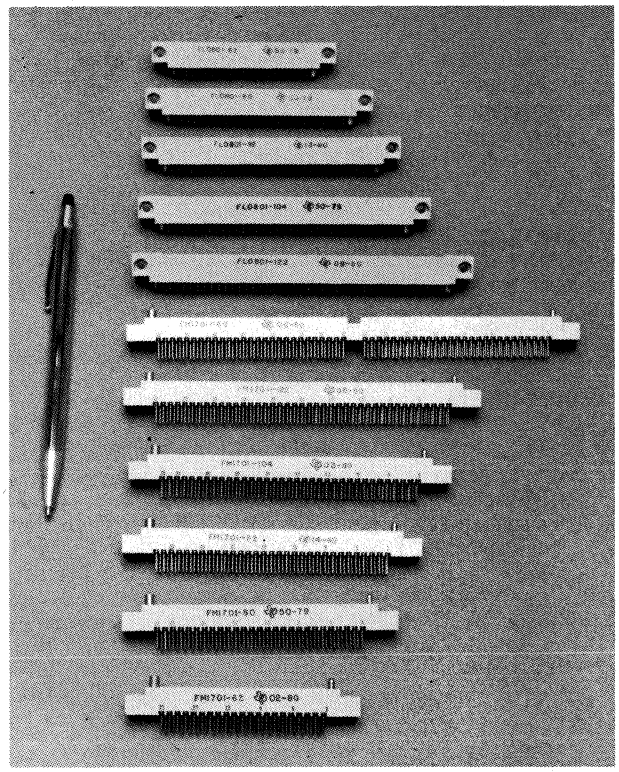
Specialty Connectors
- Single row (3-22 positions)
- Crimp pin and socket (10-70)
- 114 pin platform
- Quarter round series
- Others

(All connectors available with and without mounting ears)

AVAILABLE FEATURES

All connectors produced to MIL-C-55302 requirements.

- "Cost Saver" options reduce applied cost:
  - Seal back
  - Pre-tinned
  - Tape and plate
  - Seal caps
- Low and standard insertion force gold plated contacts are available in a variety of terminations and styles.
- Ryton R4 molded body insulators. (Diallyl phenalate available at extra cost).
- Hardware available in either stainless steel or mil-approved alloy alternative.
- All connectors may be selectively loaded



APPLICATIONS

There is a wide range of possible electronic applications for TI F-Series connectors:

- Avionics Equipment
- Military Weaponry/Electronics
- Communications - Airborne and Ground Based
- Data Processing
- Missiles
- Aerospace Electronics
- Instrumentation
- Ground Support Equipment
- Radar Electronics

For further infromation write or call:
Texas Instruments Incorporated
Connector Products Marketing, MS 14-1
Attleboro, Massachusetts 02703
Tel.: (508) 699-3800, Ext. 5211, 5234 ,5302, 5303. .

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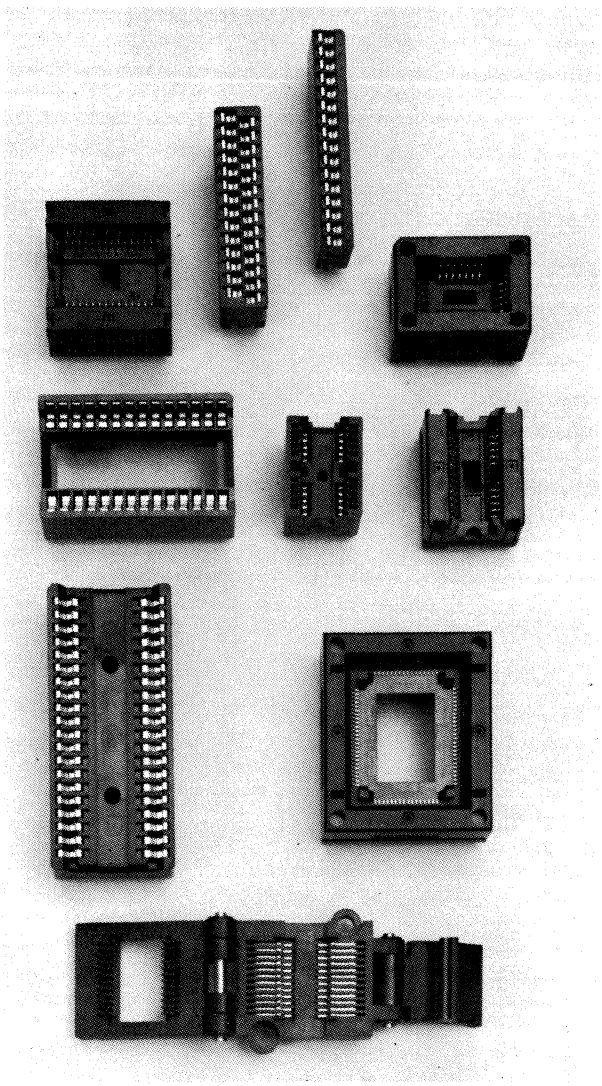
TEXAS INSTRUMENTS
34 Forest Street • Attleboro, Massachusetts 02703

BURN IN AND TEST SOCKETS FROM TEXAS INSTRUMENTS

- Designed to achieve maximum board density.
- Meets or exceeds industry test standards such as MIL-STD 202, Method 307 Environmental and Electrical Tests.
- Available in a variety of high temperature body and contact materials meeting your cost and performance objectives.
- TI standard products include Low and Zero Insertion Force versions of DIP, SOJ, SOIC, PLCC, PGA, ZIP, SIP and QFP Sockets.
- TI offers custom engineering for your unique Burn In and Test Socket requirements.



For more information write or call:
Texas Instruments Incorporated
CSD Marketing, MS 14-1
Attleboro, Massachusetts 02703
Tel.: (508) 699-5247 or 5283

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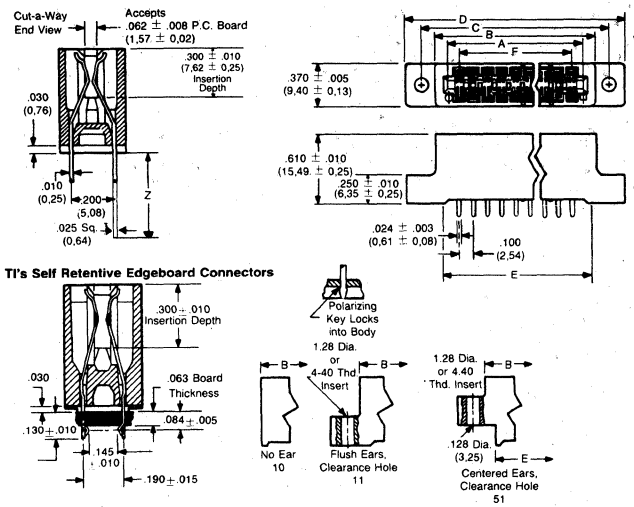
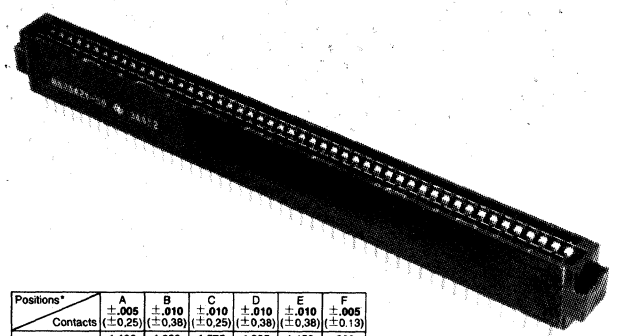
TEXAS INSTRUMENTS
34 Forest Street • Attleboro, Massachusetts 02703

H42 SERIES (.100" GRID) CONNECTORS FROM TEXAS INSTRUMENTS

H43 & H41 Series (.125", .156" grid) also available





TI's Self Retentive Edgeboard Connectors

Positions* / Contacts	A ±.005 (±0,25)	B ±.010 (±0,38)	C ±.010 (±0,25)	D ±.010 (±0,38)	E ±.010 (±0,38)	F ±.005 (±0,13)
10/20	1.100 (27,94)	1.260 (32.00)	1.575 (40,00)	1.835 (46,61)	1.150 (29,21)	.900 (22,85)
13/26	1.300 (33.0)	1.560 (39.6)	1.875 (46.6)	2.135 (54.3)	1.450 (36.8)	1.200 (30.5)
15/30	1.600 (40.64)	1.760 (44.70)	2.075 (52.71)	2.335 (59.31)	1.650 (41.91)	1.400 (35.56)
17/34	1.800 (45,72)	1.960 (49,78)	2.275 (57,59)	2.535 (64,39)	1.850 (46,99)	1.600 (40,64)
18/36	1.900 (48,26)	2.060 (52,32)	2.375 (60,33)	2.635 (66,93)	1.950 (49,53)	1.700 (43,18)
20/40	2.100 (53,34)	2.260 (57,40)	2.575 (65,41)	2.835 (72,01)	2.150 (54,61)	1.900 (48,26)
22/44	2.300 (58,42)	2.460 (62,48)	2.775 (70,49)	3.035 (77,09)	2.350 (59,69)	2.100 (53,34)
25/50	2.600 (66,04)	2.760 (70,10)	3.075 (78,11)	3.335 (84,71)	2.650 (67,31)	2.400 (60,96)
28/56	2.900 (73,66)	3.060 (77,72)	3.375 (85,73)	3.635 (92,33)	2.950 (74,93)	2.700 (65,58)
30/60	3.100 (78,74)	3.260 (82,80)	3.575 (90,81)	3.835 (97,41)	3.150 (80,01)	2.900 (73,66)
31/62	3.200 (81,28)	3.360 (85,34)	3.675 (93,35)	3.935 (99,95)	3.250 (82,55)	3.000 (76,20)
35/70	3.600 (91,44)	3.760 (95,50)	4.075 (103,51)	4.335 (110,11)	3.650 (92,71)	3.400 (86,36)
36/72	3.700 (93,98)	3.860 (98,04)	4.175 (106,05)	4.435 (112,65)	3.750 (95,25)	3.500 (88,90)
40/80	4.100 (104,14)	4.260 (108,20)	4.575 (116,21)	4.835 (122,81)	4.150 (105,41)	3.900 (99,06)
43/86	4.400 (111,76)	4.560 (115,82)	4.875 (123,83)	5.135 (130,43)	4.450 (113,03)	4.200 (106,68)
49/98	5.000 (127,00)	5.160 (131,06)	5.475 (139,07)	5.735 (145,67)	5.050 (128,27)	4.800 (121,92)
50/100	5.100 (129,54)	5.260 (133,60)	5.575 (141,61)	5.835 (148,21)	5.150 (130,81)	4.900 (124,46)
52/104	5.300 (134,6)	5.460 (138,7)	5.775 (146,7)	6.035 (153,3)	5.350 (135,9)	5.100 (129,5)
55/110	5.600 (142,2)	5.760 (146,3)	6.075 (154,3)	6.355 (160,9)	5.650 (143,5)	5.400 (137.2)

( ) = millimeters; for polarizing keys order P/N R1164-3.
*consult factory for additional sizes

Termination	Standard Solder Tail	Short Solder Tail	3 Level Wire Wrap
Z ±.015 (0,38)	.175 (4,45)	.125 (3,18)	.575 (14,61)
SHAPE OF TAIL	Beveled	Beveled	Pyramid

PART NUMBER SYSTEM

H42 XX X X – XX – X

- Series number denotes .100" × .200" Spacing
- Mounting Styles: 10. No ears; 11. Flush ears, clearance hole; 51. Centered ears, clearance hole
- Termination: 2. Solder Tail
- Contact Style/Finish: 1. 50µ" min Au Bifurcated; 2. 50µ" Tin; 3. 30µ" min Au Bifurcated; 4. 30µ" min Au Solid Beam; 5. 50µ" min Au Solid Beam
- Number of Dual Contact Position
- 3. Short solder tail
- 4. Denotes retentive lead. Orders should specify solder tail and no ear mounting style.
- R1. Right angle card extender (.150" Row-To-Row)

PERFORMANCE SPECIFICATIONS & TEST DATA

Electrical

- Current rating (amps): 3.
- Insulation resistance (megohms): 5000 min.
- Contact resistance (milliohms): 15 max.
- Dielectric withdstanding voltage (RMS): 1000 min.
- Capacitance (picofarads): 2 max.

Mechanical for .062" (1.57mm) board

- Insertion force: 12 oz./position max. (3,36 N/position max.)
- Withdrawal force: 2 oz./position min. (0,56 N/position min.)

Durability

- 50µ" Tin Solid Beam: 80 cycles.
- 30µ" Au Bifurcated: 100 cycles.
- 50µ" Au Bifurcated: 500 cycles.
- 50µ" Au Solid Beam: 1000 cycles.

Environmental

- Operating temperature: -65°C to +125°C.
- Humidity:* 90 - 95% relative humidity (40°C, 96 hr)

*Reference MIL-C-21097

MATERIALS

- Body: Glass-filled thermoplastic polyester. Black. U/L 94-VO rating.
- Contacts: CA 725 copper-nickel-tin alloy.

Polarizing keys

Lock-type. Contrasting color. No loss of contact position.

Test data

Recognized by U/L (File #E66317). Extensive test data available on request.

Consult factory for specials.

Call (508) 699-5203 or write:
Texas Instruments Incorporated
CSD Marketing, MS 14-1
Attleboro, Massachusetts 02703

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TEXAS INSTRUMENTS
34 Forest Street • Attleboro, Massachusetts 02703

SINGLE IN-LINE MEMORY MODULE SOCKETS

PERFORMANCE SPECIFICATIONS*

Mechanical

Vibration: MIL-STD-202
Durability: 30 cycles
Insertion force: 0g
Withdrawal force: 0g‡
Contact (normal) force: 150 g min.
Contact retention force: 2 lbs. per circuit min.

Electrical

Contact rating: 1A
Contact resistance: 30 mΩ max. initial
Insulation resistance: 1000 MΩ at 500 VDC
Dielectric strength: 1500 VAC RMS
Capacitance: 2 pF max.

*Values may vary due to test sequence and SIP module configuration.
‡After module is unlocked from the receptacle.
For complete test report, please contact factory.

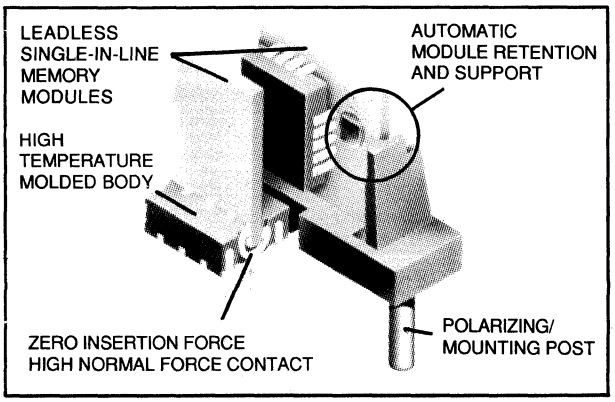
Environmental

(20 mΩ max. contact resistance change after all tests)
Operating and storage temperature: -40°C to 100°C.
Humidity: MIL-STD 202, Method 106D, 10 days.
Temperature soak: 85°C for 160 hours.
Thermal shock: 5 cycles, -40°C to 85°C per MIL-STD 202, Method 107E.
Shelf life: 12 Months min.

MATERIALS

Body - PES polyether sulfone, glass filled, black 94 VO.
Contact - Beryllium copper, phosphor bronze alloy.
Contact finishes: - Post plate min. 150 µin. tin/lead over min. 50 µin. nickel overall.
Post plate min. 30 µin. hard gold over min. 75 µin. nickel overall

For additional plating options contact the factory.



PART NUMBER SYSTEM

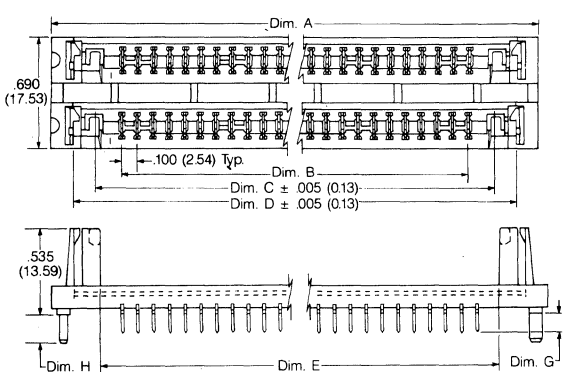
TS8X XX XX X - XX - XX

- Series number denotes
  - 0 - 0.100 in. pitch, vertical mount
  - 1 - 0.100 in. pitch, low-profile (25°) mount
- Configuration/row-to-row spacing
  - 01 - single row/N/A
  - 04 - dual row/0.400 in..
  - 05 - dual row/0.500 in.
- Contact base material/plating
  - 02 - PhBr/30 µin. gold
  - 03 - BeCu/200 µin. tin/lead
  - 04 - PhBr/200 µin. tin/lead
- Housing material
  - A - PES
- Size (number of contacts per row)
- Variations
  - 00 - standard product

Consult factory for availability of configurations, materials, and sizes.

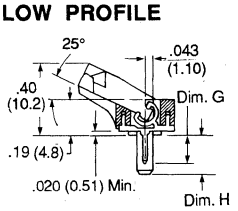
SINGLE-IN-LINE PACKAGE SOCKETS TS8 SERIES

DUAL ROW VERTICAL



Contact factory for detailed information

SINGLE ROW LOW PROFILE



Ckt. Size	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F	Dim. G	Dim. H
22	3.000 (76,20)	2.100 (53,34)	2.434 (61,82)	2.715 (68,96)	2.370 (60,20)	2.850 (72,39)	.110 (2,79)	.152 (3,86)
30	3.800 (96,52)	2.900 (73,66)	3.234 (82,14)	3.515 (89,28)	3.150 (80,01)	3.650 (92,71)	.110 (2,79)	.152 (3,86)
35	4.300 (109,22)	3.400 (86,36)	3.734 (94,84)	4.015 (101,98)	3.670 (93,22)	4.150 (105,41)	.110 (2,79)	.152 (3,86)
42	5.000 (127,00)	4.100 (104,14)	4.434 (112,62)	4.715 (119,76)	4.370 (111,00)	4.850 (123,19)	.110 (2,79)	.152 (3,86)

Dimensions in parentheses are metric.

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TEXAS INSTRUMENTS
34 Forest Street • Attleboro, Massachusetts 02703

IC SOCKETS
HIGH DENSITY PIN GRID ARRAY

PERFORMANCE SPECIFICATIONS

Mechanical

Accomodates IC leads 0.015 in. to 0.021 in. diameter.
Recommended PCB thickness range: 0.062 in. to 0.092 in.
Recommended PCB hole size range: 0.032 in. to 0.042 in.
Recommended hole grid pattern: 0.0100 in. ±0.002 in. each direction.
Vibration: 15 G, 10-2000 Hz per MIL-STD 1344A, Method 2005.1, Test Condition III.
Shock: 100 G, sawtooth waveform, 2 shocks each direction per MIL-STD 202, Method 213, Test Condition 1.
Durability: 5 cycles:, 10 Ω max. contact resistance change per MIL-STD 1344, Method 2016.
Insertion force: 3.6 oz. (102 g) per pin typ. using 0.018 in. diameter test pin.
Withdrawal force: 0.5 oz. (14 g) per pin min. using 0.018 in. diameter test pin

Electrical

Contact rating: 1.0 A per contact.
Contact resistance: 20 mΩ max. initial.
Insulation resistance: 1000 MΩ at 500 Vdc per MIL-STD 1344, Method 3003.1.
Dielectric withstanding voltage: 1000 Vac rms. per MIL-STD 1344, Method 3001.1.
Capacitance: 1.0 pF max. per MIL-STD 202, Method 305.

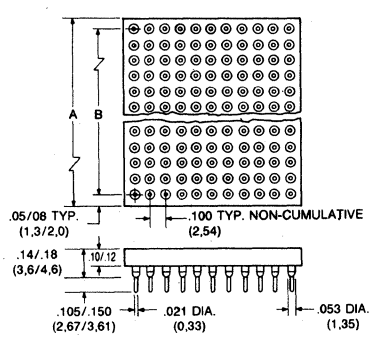
Environmental

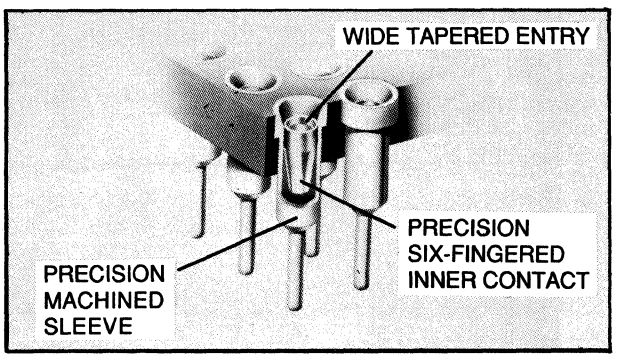
Operating temperature: -65°C to 125°C, gold; -40°C to 100°C, tin.
Corrosive atmosphere: 10 mΩ max. contact resistance change when exposed to 22% ammonium sulfide for 4 hours.
Gas tight: 10 mΩ max. contact resistance change when exposed to nitric acid vapor for 1 hour.
Temperature soak: 10 mΩ max. contact resistance change when exposed to 105°C temperature for 48 hours.
Shelf life: 12 months min.

MATERIALS

Body: PBT polyester U/L94-VO rating. On request, G10/FR4.
Outer sleeve: Machined Brass (QQ-B-626).
Inner contact: Beryllium copper (QQ-C-530) heat treated.
Plating: (specified by part number).

PIN GRID ARRAY





Inner contact: 30 µin. gold over 50 µin. nickel or 100 µin. tin/lead over 50 µin. nickel.
Outer sleeve: 10 µin. gold over 50µin. nickel or 50 µin. tin/lead over 50 µin. nickel.

PART NUMBER SYSTEM

C X G XX–XXX X X–X X X

- C: TI Socket
- X: BODY MATERIAL — G - Glass Filled Epoxy; P - PBT Polyester
- G: Pin Grid Array
- XX: Overall Grid Size — 5 x 5 = 05 to 18 x 18 = 18
- XXX: Number of Pins — 024 to 324
- X: Contact Loading Pattern — A - Standard
- X: Body Style and Orientation
- X: Plating

P/N	Sleeve	Clip
0	Gold	Gold
5	Tin	Gold

- X: Pin Length

P/N	Tail Length
3	0.510 W/W
9	0.105/0.150 S/T

- X: TI Internal Code

Insulator Size	A(±0.010)	B(±0.005*)
9 x 9	0.950 (24, 13)	0.800 (20, 32)
10 x 10	1.050 (26, 67)	0.900 (22, 86)
11 x 11	1.150 (29, 21)	1.000 (25, 40)
12 x 12	1.250 (31, 75)	1.100 (27, 94)
13 x 13	1.350 (24, 29)	1.200 (30, 48)
14 x 14	1.450 (36, 83)	1.300 (33, 02)
15 x 15	1.550 (39, 37)	1.400 (35, 56)
16 x 16	1.650 (41, 91)	1.500 (38, 10)
17 x 17	1.750 (44, 45)	1.600 (40, 64)
18 x 18	1.850 (46, 99)	1.700 (43, 18)

*Noncumulative
Dimensions in parentheses are metric
Consult factory for detailed information

PRODUCTION DATA documents contain information current as of publication date. Products conform to specificatons per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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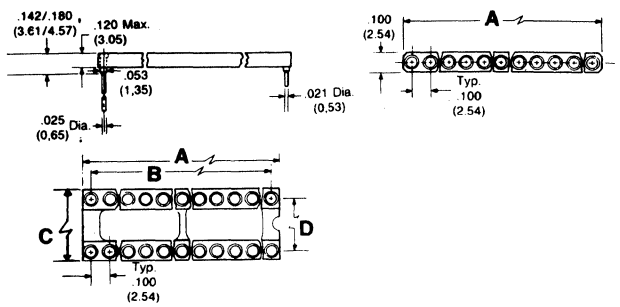
DIMENSIONS



PART NUMBER SYSTEM

C7X (X) XX(X)- X X

- Variations
  - Solder Tail
    - 9 — Pin length .105/.150
    - Wire Wrap
      - 3 — Pin length .510
- Plating (Sleeve/Clip)
  - 0 — Gold/Gold
  - 5 — Tin/Gold
- Center size (omit for standard product)
  - 3 — 300 ℄
- Number of positions
- S — single in line package (where applicable)
- Screw Machine Socket
  - 1 — wire wrap
  - 2 — solder tail

PERFORMANCE SPECIFICATIONS

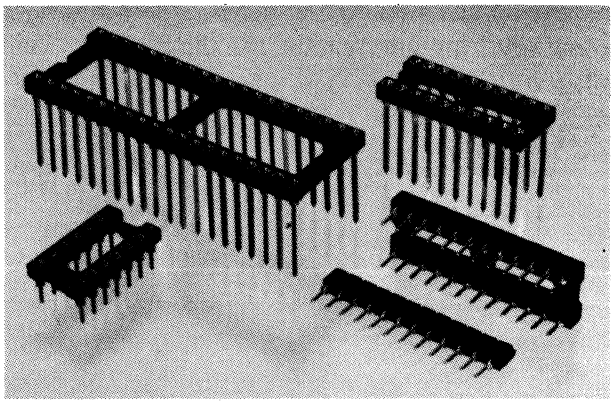
Mechanical

- Accomodates IC leads 0.011 ±.003" by 0.018 ±.003".
- Recommended PCB thickness range: .062" to .092".
- Recommended PCB hole size range: .032" to .042".
- Recommended hole grid pattern: 0.010" ±.002" each direction.
- Vibration: 15Gs, 10-2000Hz per MIL-STD 1344A, Method 2005.1, Test Condition III.
- Shock: 100 Gs, sawtooth waveform, 2 shocks each direction per MILL-STD 202, Method 213, Test Condition I.
- Durability: 5 cycles, 10 milliohm maximum contact resistance change per MIL-STD 1344, Method 2016.
- Solderability: per MIL-STD 202, Method 208.
- Insertion force: 16 oz. (454 gms) per pin maximum using 0.018" diameter test pin.
- Withdrawal force: 1.5 oz. (42 gms) per pin minimum using 0.018" diameter test pin.

Electrical

- Contact rating: 1.0 amp per contact.
- Contact resistance: 20 milliohms maximum initial.
- Insulation resistance: 1000 megohms at 500VDC per MIL-STD 1344, Method 3003.1.

Call (508) 699-5269 or write:
Texas Instruments Incorporated
CSD Marketing, MS 14-1
Attleboro, Massachusetts 02703



DIPS

Positions	Dim A max.	Dim B ± .005	Dim C Max.	Dim D ± .005	Positions	Dim A max.	Dim B ± .005	Dim C Max.	Dim D ± .005
6	.300 (7.62)	.200 (5.08)	.400 (10.16)	.300 (7.62)	*24	1.200 (30.48)	1.100 (27.94)	.400 (10.16)	.300 (7.62)
8	.400 (10.16)	.300 (7.62)	.400 (10.16)	.300 (7.62)	*24	1.200 (30.48)	1.100 (27.94)	.500 (12.76)	.400 (10.16)
14	.700 (17.78)	.600 (15.24)	.400 (10.16)	.300 (7.62)	*28	1.400 (35.56)	1.300 (33.02)	.700 (17.78)	.600 (15.24)
16	.800 (20.32)	.700 (17.78)	.400 (10.16)	.300 (7.62)	32	1.600 (40.64)	1.500 (38.10)	.700 (17.78)	.600 (15.24)
18	.900 (22.86)	.800 (20.32)	.400 (10.16)	.300 (7.62)	40	2.000 (50.80)	1.900 (48.26)	.700 (17.78)	.600 (15.24)
20	1.000 (25.40)	.900 (22.86)	.400 (10.16)	.300 (7.62)	48	2.400 (60.96)	2.300 (58.42)	.700 (17.78)	.600 (15.24)
22	1.100 (27.94)	1.000 (25.40)	.500 (12.76)	.400 (10.16)	64	3.200 (81.28)	3.100 (78.74)	1.000 (25.40)	.900 (22.86)
24	1.200 (30.48)	1.100 (27.94)	.700 (17.78)	.600 (15.24)					

SIPS

Number of Positions*	A ± .01 Length
*10	1.000
*20	2.000
*32	3.200

*Standard sizes. Alternate sizes available.

MATERIALS

- Body..... PBT polyester U/L 94 VO rating
- Contacts..... Outer sleeve: brass (QQ-B-626)
  Clip: BECU (QQ-C-533) heat treated
- Contact finish..... *Specified by part number*
  - clip 30µ" gold over 50µ" nickel or 100µ" tin/lead over 50µ" nickel.
  - sleeve 10µ" gold over 50µ" nickel or 50µ" tin/lead over 50µ" nickel.

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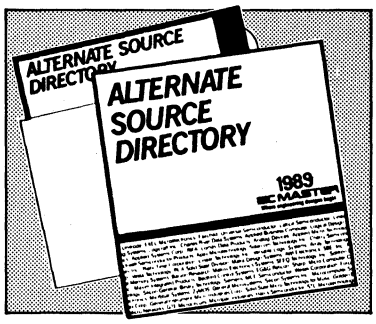

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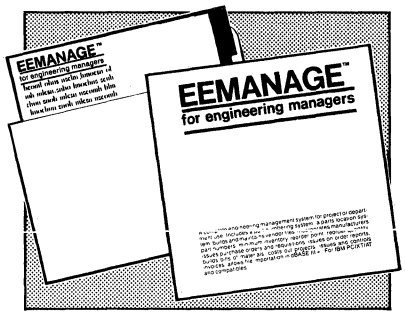

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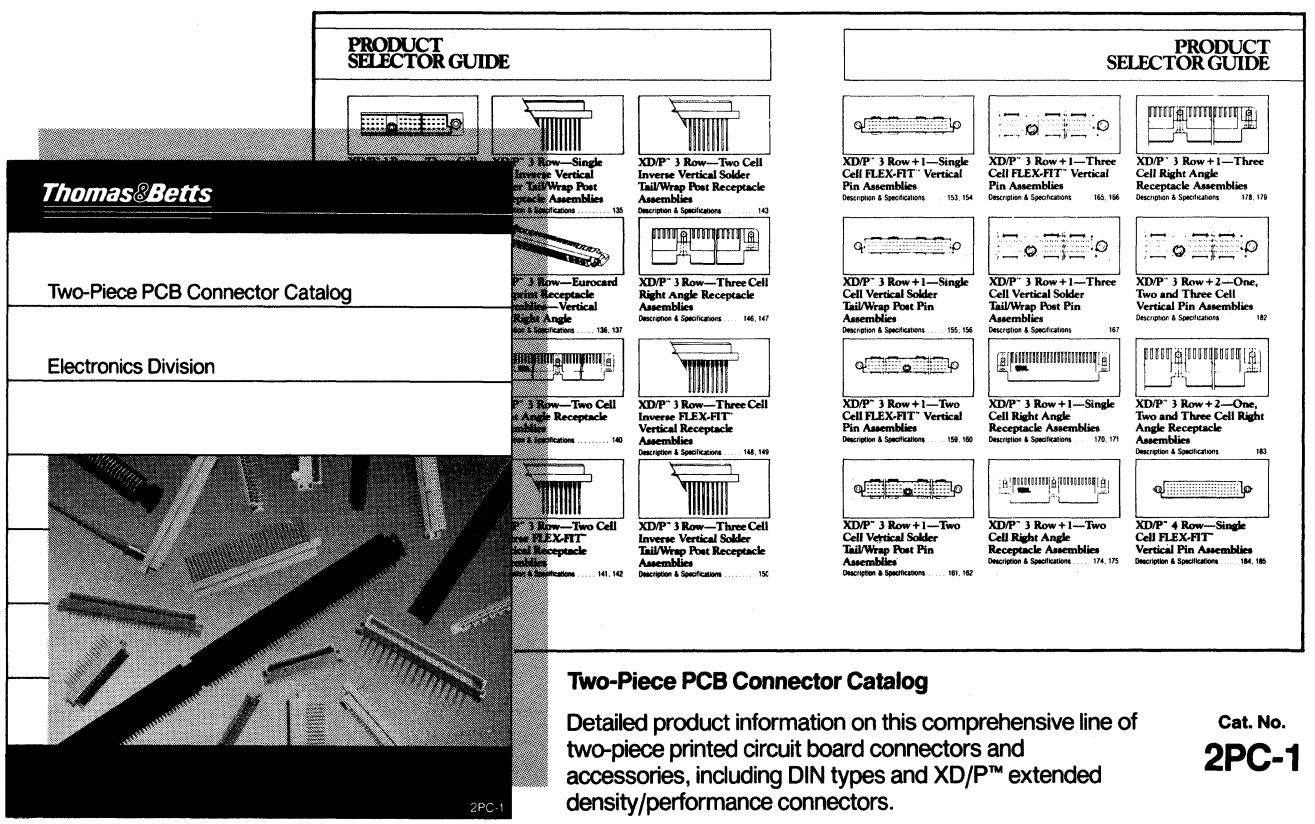

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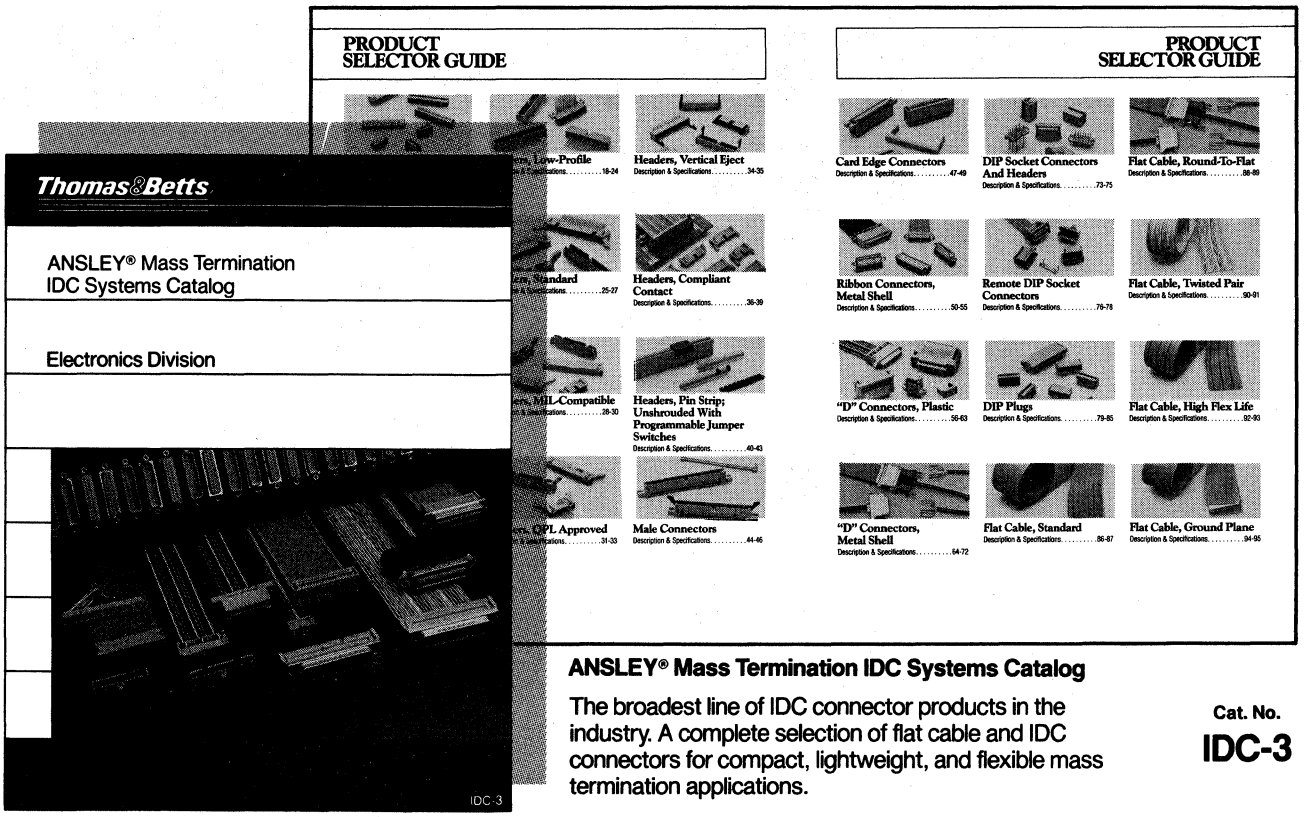

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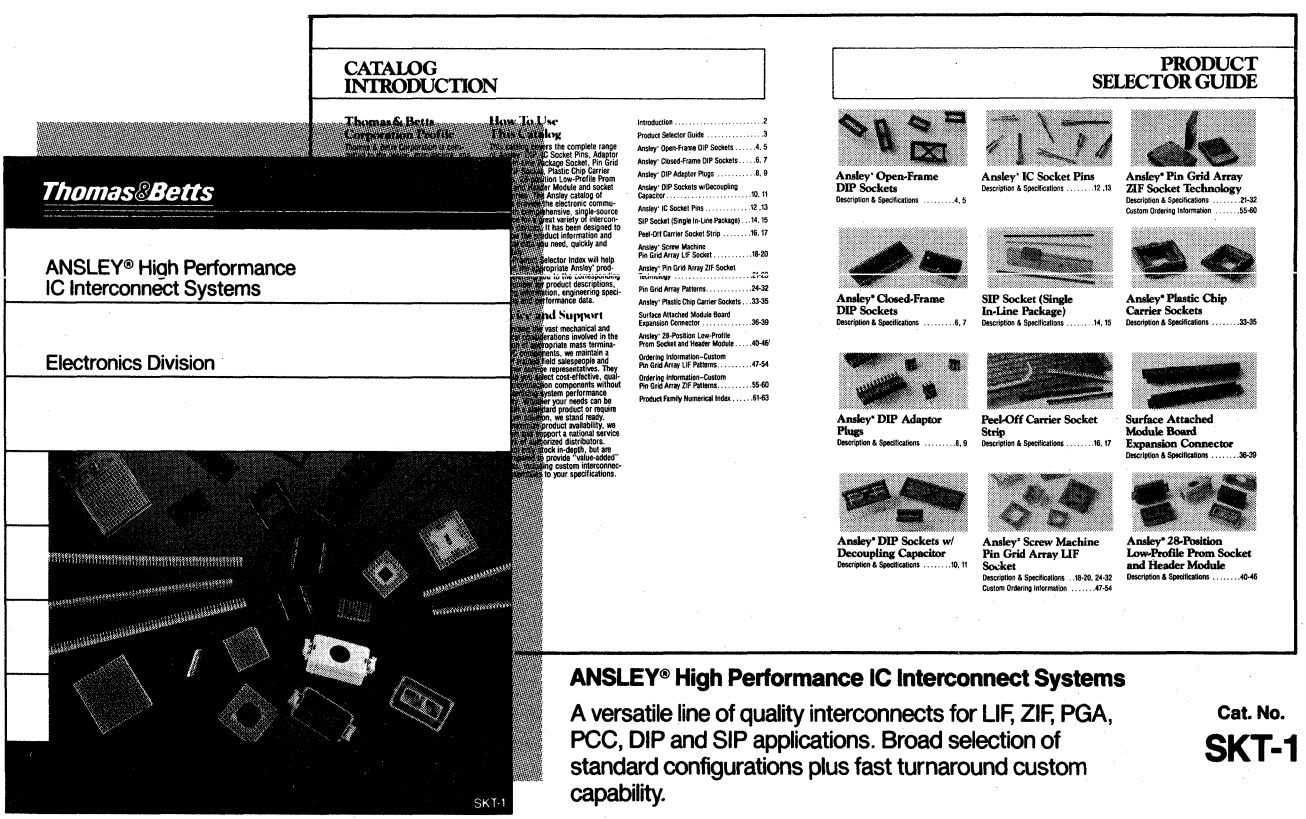

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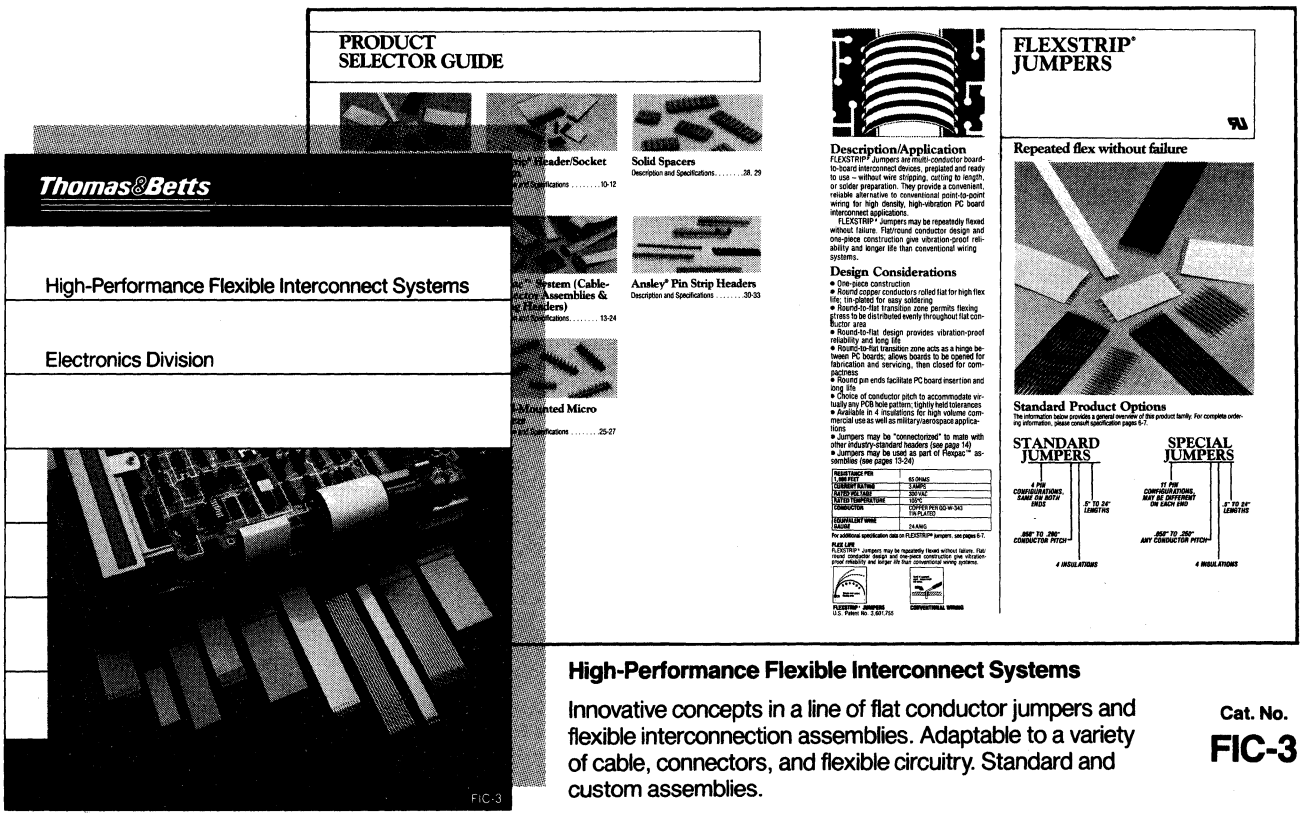

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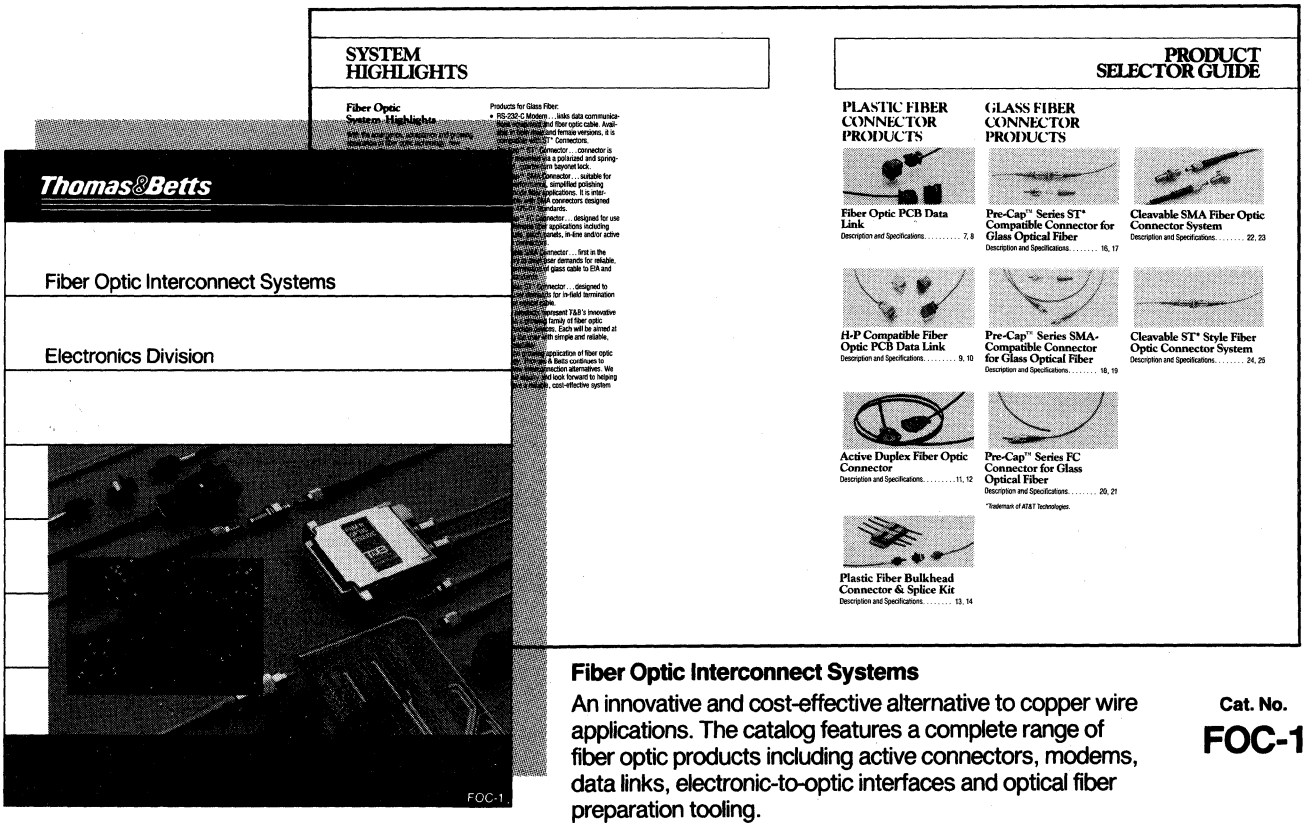

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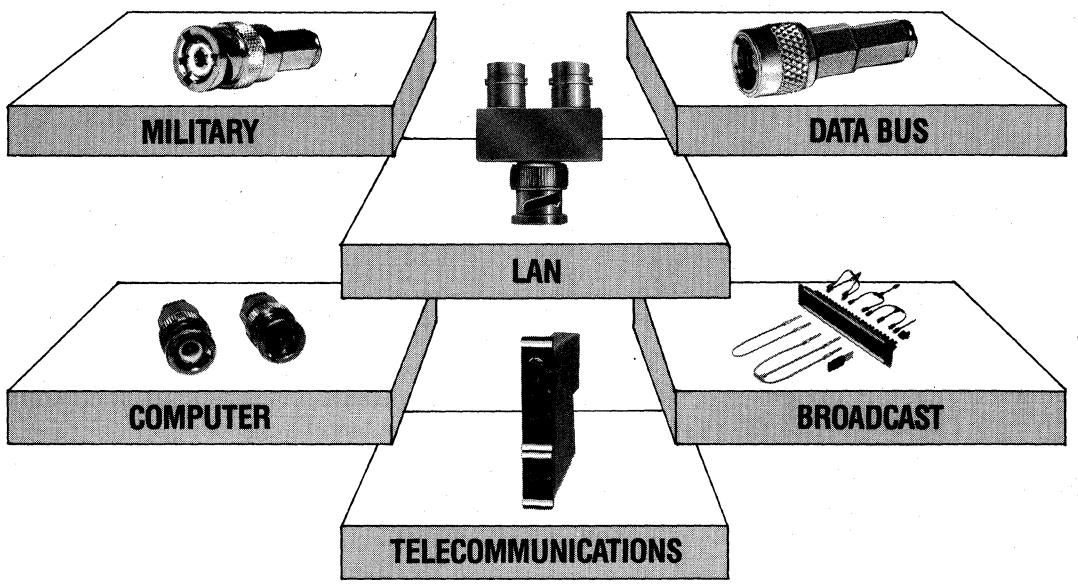

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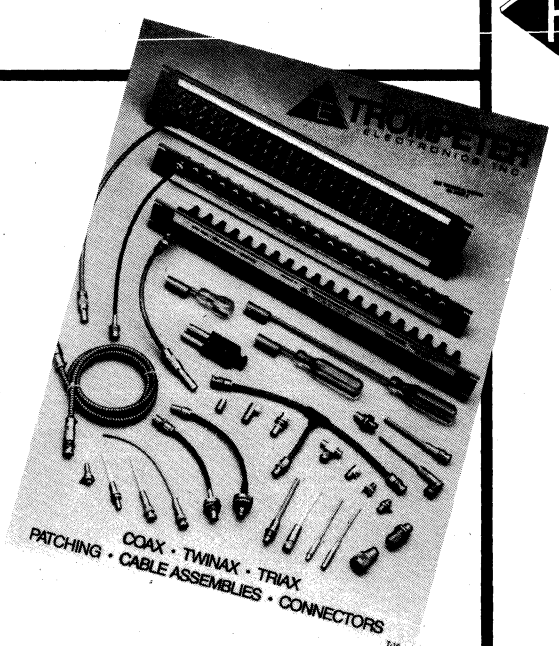

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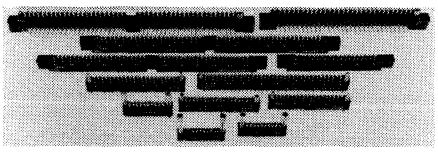

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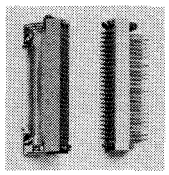
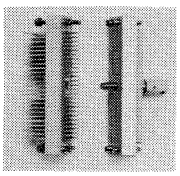
Straight, right angle, male or female. Outstanding performance characteristics. Insertion forces down to an average of 2.0–3.0 ounces per individual contact (with .0305 test pin), while maintaining a minimum separation force of 1.0 ounce per individual contact (with .0295 test pin)—half the maximum average insertion force, and double the minimum separation force, allowable per M55302.

Contact Spacing: .100" (2.54) C–C spacing; with .050" offset staggered grid.
No. of Contacts: 10, 14, 20, 24, 26. 30, 36, 40, 44, 50, 54, 56, 60, 66, 70, 90, 100, 120.
Wire Size Accommodated: #22 AWG.
Pin Diameter: .030 (.076).
Current Rating: 5 Amps (−65° C to +125° C).
Voltage Breakdown Between Contacts At Sea Level: 1000 VAC RMS.
Contact Terminations: Dip solder terminals, flexible circuit terminals, solder cup.
Molding Material Option: Ryton (standard), Diallyl Phthalate.
Hardware Options: Available in 10 standard styles—conforming to MIL-C-55302/55 through /64.
Standard and Low Insertion Force Option: Screw machine only.
NOTE: Hardware can be interchanged on all series connectors as a customer option.

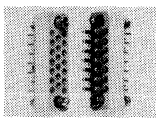




HI DENSITY-INPUT/OUTPUT-GRID SPACED—CONTACT MEETS APPLICABLE PARAGRAPHS OF MIL-C-39029
GR/RGR Series

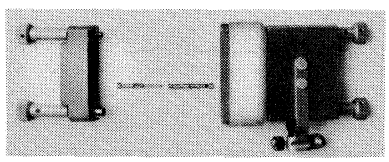
Contact Spacing: .100" × .100".
Number of Contacts: 40, 60, 80, 100 (twin jack screws) and 150 (contact center screwlock).
Wire Size Accommodated: Male (GR) #22 AWG, Female (RGR) #22 to #24 AWG.
Pin Diameter: .030" (.76).
Contact Rating: 5 Amps.
Contact Terminations: Male (GR): Wire wrap, dip solder; Female (RGR); Crimp removable #2660-22 and #2660-24 (ordered separately). Compliant pin design.
Molding Material: Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, cable clamps.

RACK AND PANEL CONNECTORS



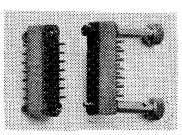
MINIATURE RECTANGULAR SOLDER CONTACT (MIW Series)
MIL-C-28748/1 and /2

Wire Size Accommodated: #16 AWG.
Pin Diameter: .062" (1.59).
Current Rating: 13 Amps max.
Voltage Breakdown Between Contacts at Sea Level: 2000 VAC RMS.
Contact Terminations: Solder cup, closed entry sockets.
Molding Material: Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, hoods.



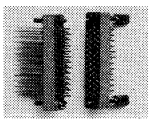
MINIATURE RECTANGULAR CRIMP REMOVABLE (URC Series)
MIL-C-28748/3 and /4

Wire Size Accommodated: #16 to #20 AWG.
Pin Diameter: .040" (1.02) and .062" (1.59).
Current Rating: 7.5 Amps and 13 Amps.
Voltage Breakdown Between Contacts at Sea Level: 4500 VAC RMS.
Contact Terminations: Q.P.L. to MIL-C-39029, crimp type closed entry socket (contacts supplied separately).
Molding Material: Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, hoods and shells. U.L. approved.



MINIATURE RECTANGULAR (IMI/CIMI)
MIL-C-28748/5 and /6

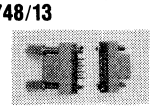
Wire Size Accommodated: #20 AWG (#18 AWG on special order).
Pin Diameter: .040" (1.02).
Current Rating: 7.5 Amps.
Voltage Breakdown Between Contacts at Sea Level: 1200 VAC RMS.
Contact Terminations: Solder cup, closed entry socket, dip solder, pre-filled solder cups.
Molding Material: Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, hoods and shells.



ULTRAMINIATURE (UMI/CUMI SERIES)
MIL-C-28748/7 and /8 (Mates with MIL-C-28748/13 and /14.)
Now available in Ryton —perfect for flex circuit applications!

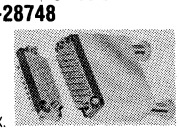
Wire Size Accommodated: #22 AWG.
Pin Diameter: .030" (.76).
Voltage Breakdown Between Terminals at Sea Level: 1000 VAC RMS.
Contact Terminations: Dip solder, wire wrap, closed entry solder cup. Pre-filled solder cups available.
Current Rating: 5 Amps max.
Molding Material Options: Ryton, Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, hoods and mounting brackets.

ULTRAMINIATURE CRIMP REMOVABLE (RUMI Series) MIL-C-28748/13 and /14 (Mates with MIL-C-28748/ 7 and /8.)



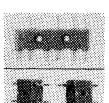
Wire Size Accommodated: #22 AWG.
Pin Diameter: .030" (.076).
Current Ratings: 5 Amps max.
Voltage Breakdown Between Terminals at Sea Level: 1000 VAC RMS.
Contact Terminations: Crimp type Q.P.L. to MIL-C-39029.
Molding Material: Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, hoods and mounting brackets.

SUBMINIATURE MEETS APPLICABLE PARAGRAPHS OF MIL-C-28748
SMI/CSMI Series



Wire Size Accommodated: #20 AWG.
Pin Diameter: .040" (1.02).
Current Rating: 7.5 Amps max.
Voltage Breakdown Between Contacts at Sea Level: 1200 VAC RMS.
Contact Terminations: Dip solder, wire wrap, right angle, solder cup, closed entry socket (CSMI).
Molding Material: Diallyl Phthalate.
Mounting Hardware Options: Guides, screwlock, hoods and shells.

SIDE MOUNTING MINIATURE
MG/CMG Series



Wire Size Accommodated: #22 AWG.
Pin Diamter: .040" (1.02).
Current Rating: 7.5 Amps.
Voltage Breakdown Between Contacts at Sea Level: 2000 VAC RMS.
Molding Material: Diallyl Phthalate.

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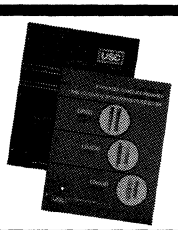

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SYMBOLS USED BY INTERNATIONAL REGULATORY AGENCIES

These symbols appear on many electrical/electronic components distributed in the world market. They indicate that a country's standard-setting agency has approved the design of the component and/or a testing agency has approved the performance of the component in meeting the standard. This page lists only those countries that have a *symbol* to represent their authority.

Argentina (IRAM) Instituto Argentino de Racionalization de Materiales

Australia (SAA) Standards Association of Australia

Austria (ÖVE) Öesterreichischer Verband für Elektrotechnik

Belgium (CEB) Comité Electrotechnique Belge

Brazil (ABNT) Associação Brasileira de Normas Teonicas

Canada (CSA) Canadian Standards Association

Czechoslovakia Urad pro Normalizaci a Mereni (Office for Standards and Measurements)

Denmark (DEK) Dansk Elektroteknisk Komite (Danish Electrotechnical Committee)

Egypt (EOS) Egyptian Organization for Standardization and Quality Control

Finland (SETI) Electrical Inspectorate

France (UTE) Union Technique de l'Électricité

Germany, Democratic Republic of (East) (ASMW) Amt für Standardi-sierung Messwesen und Warenprufung (Office for Standardization, Metrology and Quality Control)

Germany, Federal Republic of (West) (DKE) Deutsche Electrotechnische Kommission im DIN und VDE (German Electrotechnical Commission of DIN and VDE)

Greece (ELOT) The Hellenic Organization of Standardization

Hong Kong Hong Kong Standards & Testing Centre

Hungary (MSZH) Magyar Szabvanyugi Hivatal (Hungarian Office for Standardization)

India (ISI) Indian Standards Institute "Manak Bhavan"

Indonesia Badan Kerjasama Standardisasi LIPI-YDNI (LIPI-YDNI Joint Standardization Committee)

Iran Institute of Standards and Industrial Research of Iran

Ireland (IIRS) Institute for Industrial Research and Standards

Israel (SII) Standards Institution of Israel

Italy (CEI) Comitato Elettrotecnico Italiano (Italian Electrotechnical Committee)

Japan (JISC) Japanese Industrial Standards Committee Agency of Industrial Science and Technology

Korea, Republic of (South) Industrial Advance Administration

Mexico (DGN) Dirección General de Normas Secretaria de Patrimonio y Fomento Industrial Puente de Tecamachalco

Netherlands (NEC) Nederlands Elektrotechnisch Comite

New Zealand (SANZ) Standards Association of New Zealand

Norway (NEK) Norsk Elektroteknisk Komite (Norwegian Electrotechnical Committee)

Pakistan Pakistan Standards Institution

Poland Polski Komitet Normalizacji Miar i Jakosci (Polish Committee for Standardization, Measures and Quality Control)

Portugal (CEP) Comissão Electrotécnica Portuguesa

Romania Institutul Roman de Standardizare (Romanian Standards Institute)

Singapore Singapore Institute of Standards and Industrial Research

South Africa (SABS) South African Bureau of Standards

Spain (IRANOR) Instituto Nacional de Racionalización y Normalización

Sweden (SEK) Svenska Elektriska Kommissionen (Swedish Electrotechnical Commission)

Switzerland (SEV) Schweizerischer Elektrotechnischer Verein Postfach

Turkey (TSE) Turk Standardlari Enstitusu (Turkish Standards Institution)

United Kingdom (BSI) British Standards Institution

United States (ANSI) American National Standards Institute

United States (NEMA) National Electrical Manufacturers Association

Venezuela CODELECTRA en Conjunto con COVENIN Avda. Ppal.

Yugoslavia Federal Institute of Standardization

U. S. TERMINALS INC.

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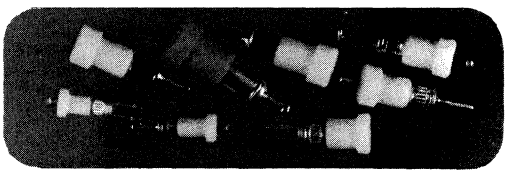
Terminals - Sockets - Connectors

SLIP LOCK®

Teflon Insulated Terminals & Jacks

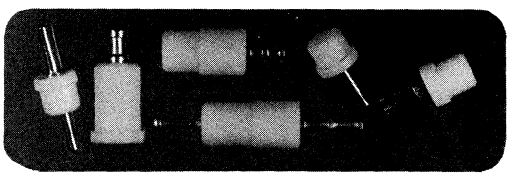
Simplest to use - no hole chamfering required; very high reliability. Used in space, military, and commercial applications.



PRESS TYPE

Teflon Insulated Terminals & Jacks

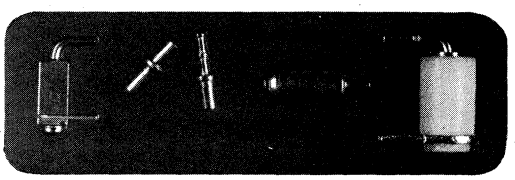
Suitable for all metal chassis applications - commercial and Mil-T-55155 types.



PRINTED CIRCUIT

Terminals & Sockets

Available in brass, copper or beryllium copper for all P.C. applications. Controlled heat treat and plating assure excellent staking and solderability.



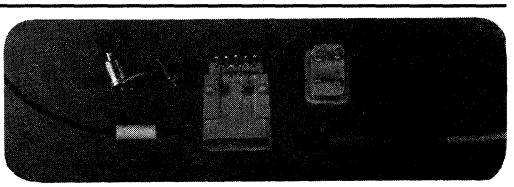
GROUNDING

Terminals

Made to same high standards as above designs, grounding terminals are one-piece brass units knurled or threaded for inserting or bolting to the metal chassis.

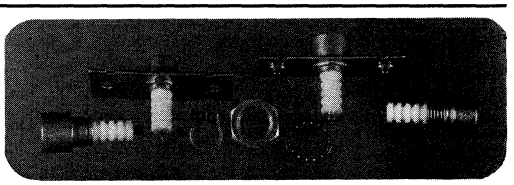
JACKS&PLUGS

For CoAx connection from plug to P.C. cards. Special Teflon insulated miniature banana plug design for highest reliability.



HIGH VOLTAGE CONNECTORS

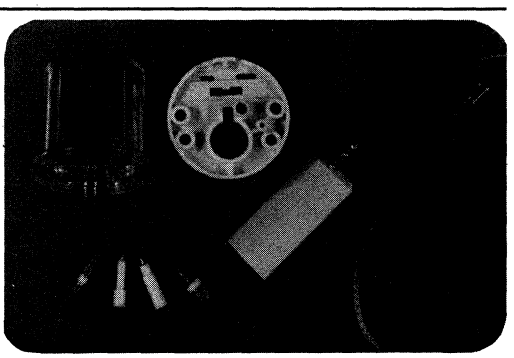
HV Miniature Connectors offer Teflon insulation. Optimum creepage path for high-voltage use is engineered to meet Mil-C-8384. Break-down voltage to 18,000 vdc.



MILITARY

Terminals, Connectors, Detonator Sockets, Test Points, Electronic Housings & CoAx Leads.

Produced to the exact requirements of the contract. Injection insert molding machining, metalforming & plating to meet specified Quantity and Quality parameters.



Special development to your order.

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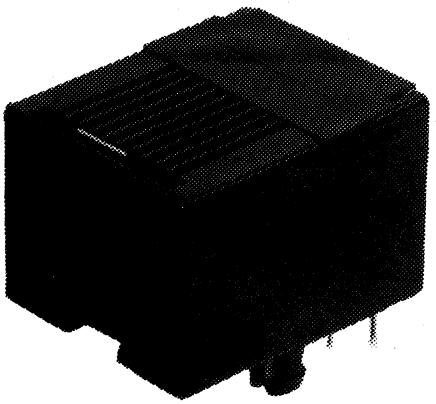
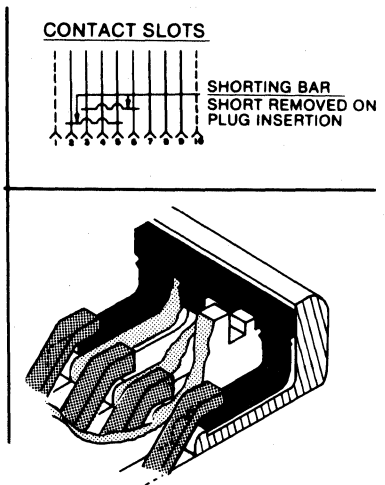
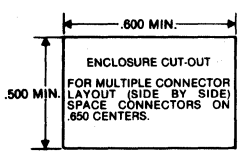
FIRST LOW PROFILE CONNECTOR WITH *MAKE* AND *BREAK* CAPABILITIES

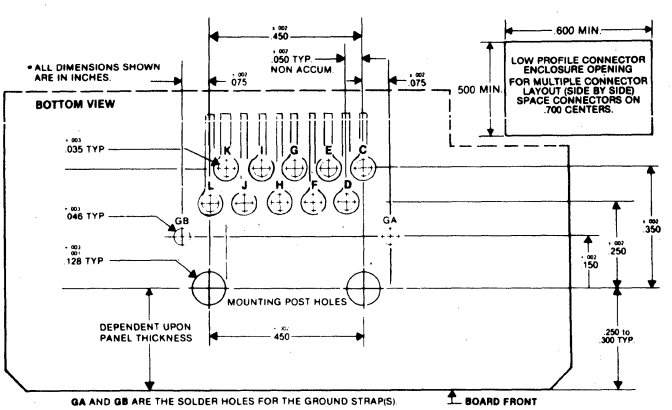




- Connector shown: Universal Service Order Code: RJ48X
- T/R: T1 R1; 8 position Jack with Shorting Bars
- Mechanical Usage: Low Profile Unkeyed 8 Position Connector
- Typical Usage: Digital Data Transmission
- Other connectors are available for StarLAN® and other local area network applications.

UNIVERSAL PRINTED CIRCUIT BOARD LAYOUT FOR ALL LOW PROFILE MODULAR CONNECTORS





ACTIVE CONTACT POSITION CHART

Connector Type	GA	C	D	E	F	G	H	I	J	K	L	GB
Handset 4 Position 4 Contacts					1	2	3	4				
Six Position 4 Contacts					1	2	3	4				
Six Position 6 Contacts				1	2	3	4	5	6			
Six Position 8 Contacts			1	2	3	4	5	6	7	8		
Eight Position 8 Contacts			1	2	3	4	5	6	7	8		
Eight Position 10 Contacts		1	2	3	4	5	6	7	8	9	10	
Eight Position Groundstrap + 8 Contacts	1		2	3	4	5	6	7	8	9	10	

Take the guesswork out of choosing which footprint pattern and enclosure cut-out to use for PCB connectors. With LOW PROFILE Female Connectors our footprint pattern and enclosure cut-out remains the same for all of our styles of connectors. The drawing above can be used for any of our connectors and the accompanying chart shows which solder post holes need to be drilled. Enclosure cut-out dimensions are also shown.

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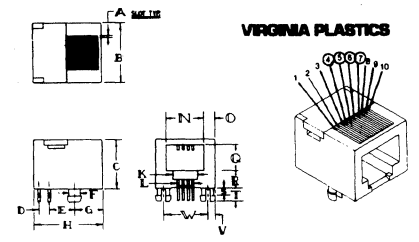
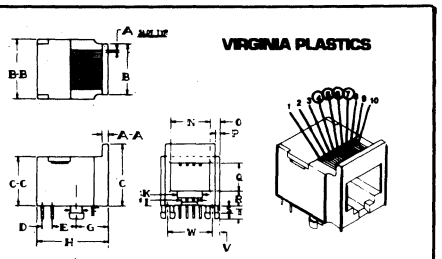
DIM.	TOLERANCE INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.
A	029 REF		7 REF	
B	580	600	14.7	15.2
C	480	500	12.2	12.7
D	092	108	2.3	2.7
E	242	258	6.1	6.6
F	120	130	3.0	3.3
G	280	310	7.1	7.6
H	670	690	17.0	17.5
I	045	055	1.1	1.4
J	162	178	4.1	4.5
K	250	270	6.4	6.9
L	155	165	3.9	4.2
M				
N	385	395	9.8	10.0
O	100 REF		2.54 REF	
P				
Q	265	275	6.7	7.0
R	130	150	3.3	3.8
S	065	075	1.7	1.9
T	111	131	2.8	3.3
U				
V	070 REF		1.8 REF	
W	441	459	11.2	11.7
X				
Y				
Z				



LOW PROFILE UNKEYED
6 POSITION TYPE
10 SLOT HOUSING
4 CONTACTS
P/N 020.000.229
6 CONTACTS
P/N 020.000.186
NOT SHOWN

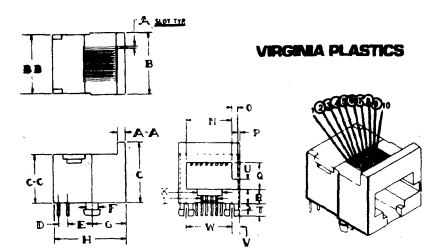
DIM.	TOLERANCE INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.
A	029 REF		7 REF	
A-A	084 REF		1.5 REF	
B	495	515	12.6	13.1
B-B	580	600	14.7	15.2
C	603	623	15.3	15.8
C-C	480	500	12.2	12.7
D	092	108	2.3	2.7
E	242	258	6.1	6.6
F	120	130	3.0	3.3
G	334	.354	7.9	8.4
H	.736 REF		18.1 REF	
I	045	055	1.1	1.4
J	212	228	5.4	5.8
K	250	270	6.4	6.9
L	155	165	3.9	4.2
M				
N	385	395	9.8	10.0
O	100 REF		2.5 REF	
P	.042 REF		1.1 REF	
Q	265	275	6.7	7.0
R	130	150	3.3	3.8
S	065	075	1.7	1.9
T	111	131	2.8	3.3
U				
V	070 REF		1.8 REF	
W	441	459	11.2	11.7



LOW PROFILE FACADE UNKEYED
6 POSITION TYPE
10 SLOT HOUSING
4 CONTACTS
P/N 020.000.007
6 CONTACTS
P/N 020.000.003
NOT SHOWN

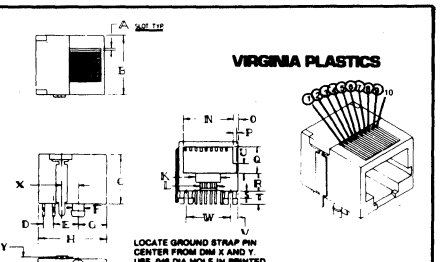
For Universal PCB Layout call Virginia Plastics, (703)985-3811

DIM.	TOLERANCE INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.
A	029 REF		7 REF	
A-A	084 REF		2.1 REF	
B	608	628	15.4	16.0
B-B	580	600	14.7	15.2
C	603	623	15.3	15.8
C-C	480	500	12.2	12.7
D	092	108	2.3	2.7
E	242	258	6.1	6.6
F	120	130	3.0	3.3
G	335	355	8.5	9.0
H	.730 REF		18.5 REF	
I	045	055	1.1	1.4
J	112	128	2.8	3.3
K	250	270	6.4	6.9
L	155	165	3.9	4.2
M				
N	465	475	11.8	12.1
O	050 REF		1.3 REF	
P	030 REF		8 REF	
Q	265	275	6.7	7.0
R	130	150	3.3	3.8
S	065	075	1.7	1.9
T	111	131	2.8	3.3
U	106 REF		2.7 REF	
V	070 REF		1.8 REF	
W	441	459	11.2	11.7



LOW PROFILE FACADE KEYED
8 POSITION TYPE
10 SLOT HOUSING
8 CONTACTS
P/N 020.000.002

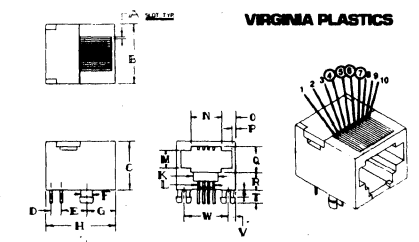
DIM.	TOLERANCE INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.
A	029 REF		7.4 REF	
B	580	600	14.7	15.2
C	480	500	12.2	12.7
D	092	108	2.3	2.7
E	242	258	6.1	6.6
F	120	130	3.0	3.3
G	280	300	7.1	7.6
H	670	690	17.0	17.5
I	045	055	1.1	1.4
J	112	128	2.8	3.3
K	250	270	6.4	6.9
L	155	165	3.9	4.2
M				
N	465	475	11.8	12.1
O	050 REF		1.3 REF	
P	040	060	1.0	1.3
Q	265	275	6.7	7.0
R	130	150	3.3	3.8
S	067	077	1.7	2.0
T	111	131	2.8	3.3
U	101	111	2.6	2.8
V	070 REF		1.8 REF	
W	441	469	11.2	11.7
X	140	160	3.6	4.1
Y	065	085	1.7	2.2
Z				



LOW PROFILE KEYED
8 POSITION TYPE
10 SLOT HOUSING
8 CONTACTS
POS #1 GROUND STRAP CONTACT
P/N 020.000.015

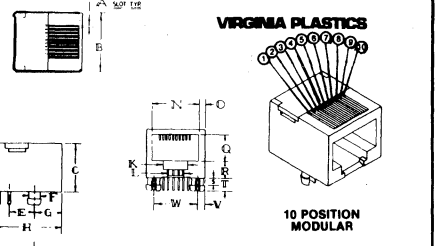
Numbers with circles are Contact Positions.

DIM.	TOLERANCE INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.
A	029 REF		7 REF	
B	580	600	14.7	15.2
C	480	500	12.2	12.7
D	092	108	2.3	2.7
E	242	258	6.1	6.6
F	120	130	3.0	3.3
G	280	300	7.1	7.6
H	670	690	17.0	17.5
I	045	055	1.1	1.4
J	212	228	5.4	5.8
K	250	270	6.4	6.9
L	155	165	3.9	4.2
M	170	190	4.3	4.8
N	303	313	7.7	8.0
O	100 REF		2.54 REF	
P	040 REF		1.0 REF	
Q	265	275	6.7	7.0
R	130	150	3.3	3.8
S	065	075	1.7	1.9
T	111	131	2.8	3.3
U				
V	070 REF		1.8 REF	
W	441	469	11.2	11.7
X				
Y				
Z				



LOW PROFILE HANDSET
4 POSITION TYPE
10 SLOT HOUSING
4 CONTACTS
P/N 020.000.010

DIM.	TOLERANCE MIN.	MAX.
A	.029 REF.	
B	.580	.600
C	.480	.500
D	.092	.108
E	.242	.258
F	.120	.130
G	.280	.310
H	.670	.690
I	.045	.055
J	.062	.078
K	.250	.270
L	.155	.165
M		
N	.465	.475
O	.060 REF.	
P		
Q	.265	.275
R	.130	.150
S	.065	.075
T	.111	.131
U		
V	.070 REF.	
W	.441	.459
X		
Y		
Z		



LOW PROFILE
10 POSITION TYPE
10 SLOT HOUSING
10 CONTACTS
P/N 020.000.068

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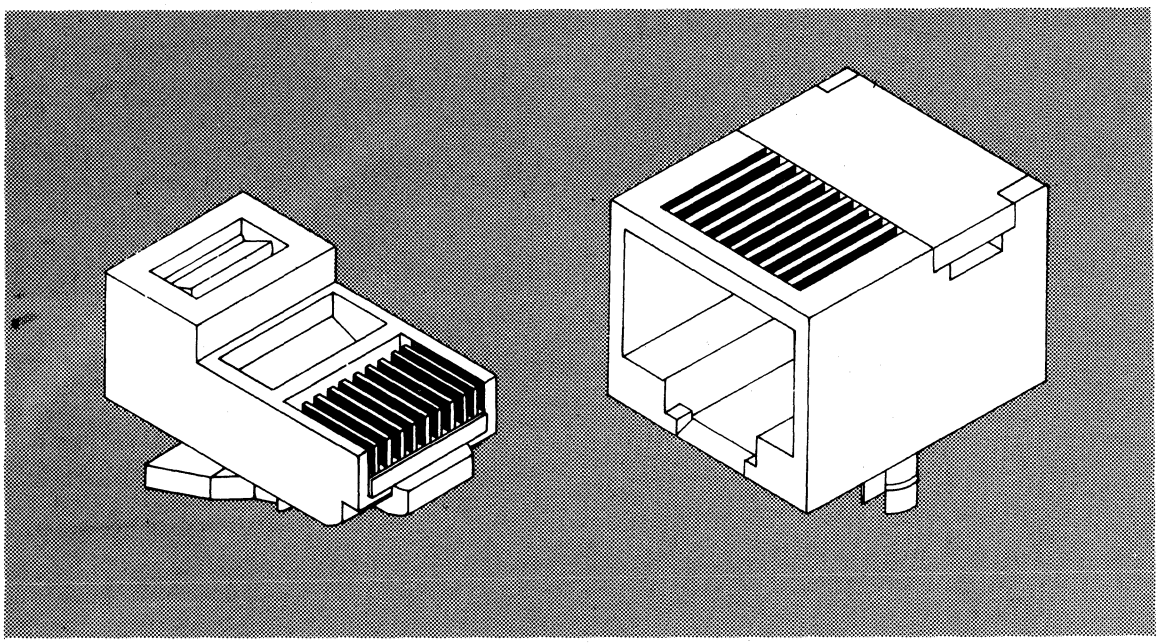
10 Position Modular



For expanded electronic applications **Virginia Plastics** has added additional lines to our male and female connector systems. The result is modular plugs and PC mount jacks with 10 conductor capability.

VIRGINIA PLASTICS WILL CONSTRUCT A WIRING HARNESS TO MEET YOUR SPECIFICATIONS.

CORDSET FEATURES:
- *10 conductors *(maximum).*
- *24 or 26 or 28 AWG conductor sizes in cable harness.
- *Non-shielded, single shielded, or double shielded cable styles.
- *20 AWG drain wire in shielded constructions.
- *UL recognized wiring harness *(style #20187).*

CONNECTOR FEATURES:
- *10 conductors *(maximum).*
- *Stress protected contact design in female connector.
- *Low profile PCB connectors *(female .500" max. height above board).*
- *Moderate cost
- *High reliability.
- *100% electronically tested for microsecond interruptions.

COMPARE COST/PERFORMANCE OF THESE SYSTEMS TO THE **9 PIN SUB-D** OR **9 PIN DIN** OR **10 PIN RIBBON** CABLE CONNECTOR YOU ARE PRESENTLY USING.

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FAX 703-375-0135

Connector Technical Specifications

ELECTRICAL	CONNECTOR SERIES DT	SP
Contact Resistance (per contact) Initial After cycling**	10 milliohms max. 20 milliohms max.	10 milliohms max. 20 milliohms max.
Insulation resistance (adjacent contacts)	1000 megohms min.	1000 megohms min.
Dielectric withstanding voltage (adjacent contacts)	1000 VRMS @ 60 sec. duration	1000 VRMS @ 60 sec. duration
Current rating (per contact)	3.0 amps maximum	2.0 amps maximum
Contact Interruptibility (During rotation of a mated VPC cordset)	No interruption of duration ≥ 50 u sec.	No interruption of duration ≥ 50 u sec.
Durability (mating cycles) Plating type 1 Plating type 2	 750 minimum 1000 minimum	 500 minimum 750 minimum

**Cycling is in accordance with the Durability specified minimum mating cycles

MECHANICAL	DT	SP
Insertion Force (to fully insert matching fully populated male into female) Female — Male Plug Size (max.) 8-10 position — 0.264"X0.464" 6 position — 0.264"X0.384" 4 position — 0.264"X0.304"	2 lbs maximum	4 lbs maximum
Plug Retention in Female (Plug mated into female shall not disengage and maintains electrical continuity. Load is applied parallel with plug axis and away from female.)	20 lb max. load	20 lb max. load
Female Retention on Printed Circuit Board (Female installed on PCB shall not disengage from PCB under load. Load is applied parallel with PCB axis and in the direction rear to front of female.) Prior to flow solder After flow solder	 20 lb max. load 20 lb max. load	 20 lb max. load 20 lb max. load
Spring Contact Life (Based on passing the contact interruptibility test after the specified mating cycles. Not based on plating durability.)	≥ 5,000 cycles nominal	≥ 3,000 cycles nominal
Contact Durability After Overstress (Based on passing the contact interruptibility test after mating of a handset 4 position plug into 6 or 8 or 10 position female and/or mating of a 6 position plug into 8 or 10 position female).	500 cycles max.	500 cycles max.

Disclaimer of Warranty and Liability

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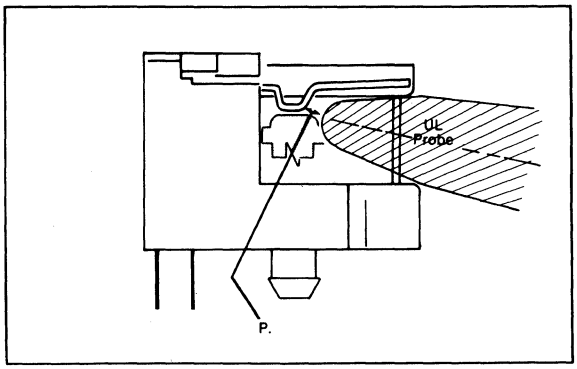
MATERIAL	CONNECTOR SERIES DT	SP
Female connector housing/cover	High Temperature polyamide and/or polyester	same
Housing/cover flammability	passes UL94V-O	same
Contact	Beryllium copper	same
Plating		
Barrier underplate	50 micro-inch minimum nickel	same
Mating spring contact area Type 1 or Type 2		
Type 1-Standard (comparable to 30 micro-inch hard gold	15 micro-inch minimum AUPD gold alloy	same
Type 2 - Optional (comparable to 50 micro-inch hard gold)	30 micro-inch minimum AUPD gold alloy	same
Solder post	100 micro-inch minimum tin-lead	same

VPC SP Modular Connectors



SAFETY FEATURES

P.-Spring contact cannot be reached or engaged by the UL (IEC) Accessibility "Safety" Probe when probe is inserted into the opening for the plug (tested by VP test lab).
-Meets the UL criteria that a person will not contact parts that involve a risk of electric shock...
-Safety design prevents bypassing or defeating access means such as doors.
-**Safety Caution: The ring circuit on a telephone line during ring, produces a 90 to 120 pulsed D.C. voltage which could be Hazardous.**

SPECIFIC FEATURES

-Current rating 2.0 Amps per contact
-Durability 500 minimum mating cycles
-Interchangable with Virginia Plastics DT Series Connectors

cem MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination.* This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float.* Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof.* May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card.* The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement.*

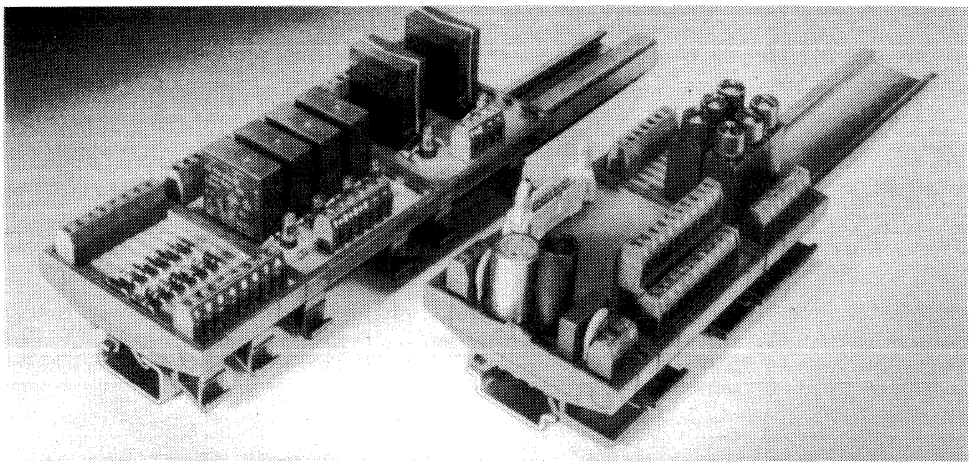
Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage.* Can be confused with the term used to describe how many times a connector may be mated and separated.

Withstanding voltage: Also called *test voltage.* The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

WECO® ELECTRONIC MODULES FOR MOUNTING RAILS TO DIN EN 50022 AND DIN EN 50035



RAIL MOUNTED MODULES

The most important criteria of todays large and complex production machinery is ease of design, cost effective maintenance and minimum down time.
Recognizing this, the industrial control and machine industry has tended towards greater centralization of components, test and disconnect points. Trouble shooters are more effective and safer if their area of activity is accessible and logically arranged.
This, amongst other things, has resulted in rail mounted terminal blocks, which have proven to be very effective.
Grouping of terminal blocks and inclusions of diodes, fuses and switches came as the next step.
Down time and cost of repair have benefitted considerably from the introduction of the more advanced rail mounted module.
One category serves as interface between controller or micro processor and power circuits, others serve as interface between two wiring systems.
Other units carry components such as diodes, fuses and varistors; or sub systems such as power supplies, opto couplers, relays etc.
Maintenance personnel are now able to identify problems in a central, well designated area without crawling around potentially dangerous machinery.
The modules listed below are suitable for all popular DIN rails as well as individual panel mounting by means of spacers.
For detail information, or modules to your specifications, please contact our office.

RELAY MODULE MRPA. 1, 4, 8 relays each with one SPDT contact. Contact rating 380 V AC 8 A. Choice of operating voltage

RELAY MODULE MRPB. 1, 2, 4 relays each with two SPDT contacts. Contact rating 380 V AC 8 A Choice of operating voltage

RELAY MODULE MRPC. 1, 2, 4 relays each with two SPDT contacts Contact rating 250 V AC 3 A Choice of operating voltage

RELAY MODULE MRPD. 1 relay Double SPDT contact, rated 125 V AC 0.48 A., 60V DC 0.5 A. 24V Op. volt. AgPd contacts

RELAY MODULE MRKA. 1-11 relays with 4 SPDT silver, gold plated contacts rated 115 V AC 0.43 A. DC Operating voltage 24 V

TIMER MODULE MRZA. slow make One SPDT contact 220 V 3 A. Operates on 24V DC Adj. time delay, 3 ranges, 0.15-60 sec.

TIMER MODULE MRZB. slow break one SPDT contact 220 V AC 3 A. Operates on 24V DC Adj. time delay, 3 ranges, 0.15-60 sec.

RELAY PULSING MODULE MRZE. Symmetrical pulses, adj.in 3 ranges (1-200 per min.) Oper. voltage 24V DC. SPDT contact.

MODULES TO YOUR SPECIFICATIONS We custom design modules specifically for your application. Please submit your requirements for a proposal.

INTERFACE MODULE MTB 60V AC 1A Plug connector input, acc. to DIN 41651. Choice of output terminals. 10-64 contacts.

INTERFACE MODULE MTBL 24V AC 1A Plug connector input, choice of output terminals. One LED per channel. 10-64 contacts.

INTERFACE MODULE MTD 125V AC 1.5A D-Sub miniature plug input, choice of output terminals. 9-50 contacts.

DISTRIBUTOR MODULE MTE 125V AC 1.5A Multi conduit cable input via plug according to DIN 41612, Choice of output terminals.

INTERFACE MODULE MTK 125V AC 1.5A EURO-BOARD carrier with 64 in / out positions, with choice of terminals. Board 100×160 mm

INDICATOR (LED) MODULE MAZ Seven LED's, red, green or yellow. Operating voltages optional : 5, 12, 24 DC, 110 AC

DO IT YOURSELF MODULE MBC PCB for component mounting. 250V AC 5A. 8 or 12 channels. Choice of terminals.

DIODE MODULE, MDD Choice of 1 or 3 A. maximum of 12 channels. Choice of terminals. Choice of diode combinations.

EMPTY MODULE HOUSING Accommodates customer designed PCB's of variable sizes for rail, or panel mounted applications

DIODE LAMP-TEST MODULE MDL 250V AC max. 1N4007 - 1A, BY255 - 3A. Maximum 11 channels. Checks annunciator circuits.

RECTIFIER MOD. MGR 220V AC max. Choice of 1A or 3A. Bridge rectifier. Varistor protected. Choice of different versions.

POWER SUPPLY MODULE MPU Output 24V DC, 1A max. Non regulated. Input 220 / 110 V AC

POWER SUPPLY MODULE MPR Output 24V DC, ± 0.5 V 1.1A, Regulated, Input 220 / 110 V AC

VARISTOR MODULE MWV Choice of operating voltage 11-275 V. Max. 8 channels, Choice of configuration.

FUSE MODULE MSG Maximum of 6 glass cartridge fuses, 6.3A max., 250V AC max. Choice of terminals.

OPTO COUPLER MODULE MHST Up to 4 I / O couplers per Module Complete galvanic separation. DC, AC input and output.

SEMICOND. SWITCH MODULE MHSA 01 Switching(RMS) : 240V, 2A Peak 100 A. Opto-coupler isolation. Control 5-30 V DC.

DC SEMICOND. SWITCH MOD. MHSD 01 Switching : 40V DC max. 1 A max. Opto-coupler isolation. Control 8 - 30 V, 3 - 12 mA

USA
WECO Electrical Connectors Inc.
Trimex Building, Rt. 11
Mooers, NY 12958

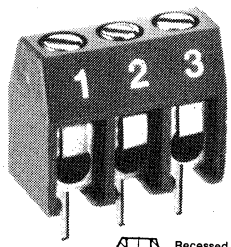
Phone : (518) 298-4810 - FAX : (518) 298-5938

CANADA
WECO Eletrical Connectors Inc.
16805 Hymus Blvd.
Kirkland, Que. H9H 3L4

Phone : (514) 694-9136 - (514) 694-0518 - FAX : (514) 694-0956

WECO® SCREW CONNECTORS FOR PRINTED CIRCUITS

Figure No. 1



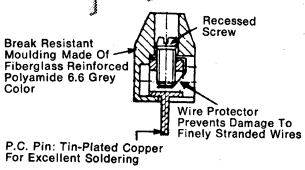
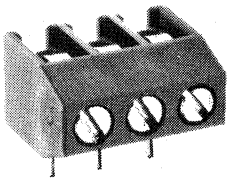


Figure No. 2



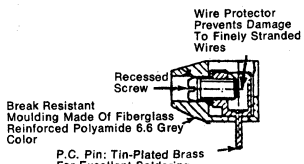
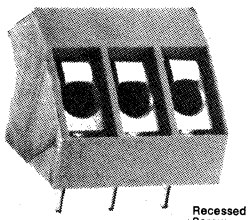


Figure No. 3



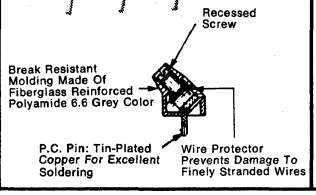
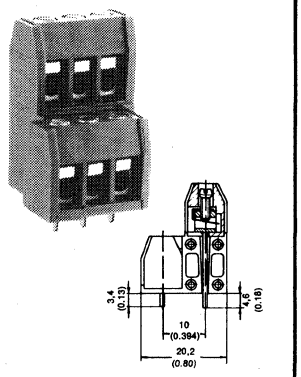


Figure No. 4



International Approvals: VDE rated 0110

Type	No. of Circuits	Block length = No. of circuits required x pitch mm	Block length = No. of circuits required x pitch in	Height mm	Height in	Width mm	Width in	Wire Entrance relative to PCB: horizontal	45°angled	vertical	UL recognized for: (File No.: E69841) Voltage	Amperage	AWG	CSA approved for: (File No.: LR24322) Voltage	Amperage	AWG	Design similar to figure No.:
930 TDS	2-3△	3.5	0.138	8.7	0.34	8	0.31	X			125	7	16-26	300	7	16-26	1
931 TDS	2-3△	3.5	0.138	8	0.31	8.7	0.34			X	125	7	16-26	300	7	16-26	2
938 TDS	2-3△	3.5	0.138	8.7	0.34	8	0.31	X			125	7	16-26	300	7	16-26	1
940 DS	2-32*△	5.08	0.200	11.5	0.45	8	0.31	X			300	15	14-22	300	15	14-26	1
941 DS	2-32*△	5.08	0.200	8	0.31	11.5	0.45			X	300	15	14-22	300	15	14-26	2
942 DS	2-16	10.16	0.400	11.5	0.45	8	0.31	X			300	15	14-22	300	15	14-26	1
943 DS	2-16	10.16	0.400	8	0.31	11.5	0.45			X	300	15	14-22	300	15	14-26	2
950 DS	2-32*△	5	0.197	10	0.39	8	0.31	X			300	15	14-22	300	15	14-26	1
951 DS	2-32*△	5	0.197	8	0.31	10	0.39			X	300	15	14-22	300	15	14-26	2
952 DS	2-16*	10	0.394	10	0.39	8	0.31	X			300	15	14-22	300	15	14-26	1
953 DS	2-16	10	0.394	8	0.31	10	0.39			X	300	15	14-22	300	15	14-26	2
960 DS	2-32△	5.08	0.200	13.5	0.53	9	0.35	X			300	20	12-22	300	15	10-26	1
961 DS	2-32△	5.08	0.200	9	0.35	13.5	0.53			X	300	20	12-22	300	15	10-26	2
962 DS	2-16	10.16	0.400	13.5	0.53	9	0.35	X			300	20	12-22	300	15	10-26	1
963 DS	2-16	10.16	0.400	9	0.35	13.5	0.53			X	300	20	12-22	300	15	10-26	2
964 DS	2-3△	5.08	0.200	12	0.47	12.5	0.49		X		300	20	12-22	300	15	10-26	3
968 DS□	2-32△	5.08	0.200	13.5	0.53	9	0.35	X			300	20	12-22	300	20	10-26	1
969 DS□	2-16	10.16	0.200	13.5	0.53	9	0.35	X			300	20	12-22	300	20	10-26	1
970 DS	2-32△	5	0.197	13	0.51	9	0.35	X			300	20	12-22	300	15	10-26	1
970 HSEDS	2-32	5	0.197	27	1.06	10.5	0.41	X			300	20	12-22	300	15	10-26	1
~~972 HSEDS~~	~~2-16~~	~~10~~	~~0.394~~	~~27~~	~~1.06~~	~~10.5~~	~~0.41~~	~~X~~			~~300~~	~~20~~	~~12-22~~	~~300~~	~~15~~	~~10-26~~	~~1~~
971 DS	2-32△	5	0.197	9	0.35	13	0.51			X	300	20	12-22	300	15	10-26	2
972 DS	2-16	10	0.394	13	0.51	9	0.35	X			300	20	12-22	300	15	10-26	1
973 DS	2-16	10	0.394	9	0.35	13	0.51			X	300	20	12-22	300	15	10-26	2
974 DS	2-26*△	5	0.197	12	0.47	12.5	0.49		X		300	20	12-22	300	15	10-26	3
975 DS	2-13*	10	0.394	12	0.47	12.5	0.49		X		300	20	12-22	300	15	10-26	3
976 DS	2-3△	7.5	0.295	12	0.47	12.5	0.49		X		300	15	12-22	300	15	10-26	3
977 DS†□	2-3	7.5	0.295	13	0.51	9.5	0.37	X			300	15	12-22	300	15	10-26	1
977 OPDS□	2-19	7.5	0.295	13	0.51	9	0.35	X			300	15	12-22	300	15	10-26	1
977 OPSGDS	2-19	7.5	0.295	9.5	0.37	13	0.51			X	300	15	12-22	300	10	10-26	2
978 DS□	2-32△	5	0.197	13	0.51	9	0.35	X			300	20	12-22	300	20	10-26	1
978 HSEDS□	2-32	5	0.197	27	1.06	10.5	0.41	X			300	20	12-22	300	20	10-22	1
979 HSEDS□	2-16	10	0.394	27	1.06	10.5	0.41	X			300	20	12-22	300	20	10-22	1
979 DS□	2-16	10	0.394	13	0.51	9	0.35	X			300	20	12-22	300	20	10-26	1
910 DS	2-12	10	0.394	14	0.55	9	0.35	X			300	25	18-10	150/300	25/10	8-14	1
970 EDS	4-64	5	0.197	27	1.06	20.2	0.80	X			300	20	12-22	300	20	12-26	4
"Tiered Terminal": Two rows of the type 970 EDS are offset by half of the pitch. Produces an effective pitch of 2.5 mm/0.096 in.																	
972 EDS	4-32	10	0.394	27	1.06	20.2	0.80	X			300	20	12-22	300	20	12-26	4
"Tiered Terminal": Two rows of the type 972 DS are offset by half of the pitch. Produces an effective pitch of 5 mm/0.197".																	
978 EDS□	4-64	5	0.197	27	1.06	20.2	0.80	X			300	20	12-22	300	20	10-26	4
"Tiered Terminal": Two rows of the type 978 DS are offset by half of the pitch. Produces an effective pitch of 2.5 mm/0.096 in.																	
979 EDS□	4-32	10	0.394	27	1.06	20.2	0.80	X			300	20	12-22	300	20	10-26	4
"Tiered Terminal": Two rows of the type 979 DS are offset by half of the pitch. Produces an effective pitch of 5 mm/0.197".																	

*: Terminal strips can be butted side by side to form any requested pole configuration without losing center-to-center spacing.
†: Each circuit is equipped with a test hole.
△: A2 and 3 pole version of the block is available featuring the Dovetail Interlocking System, enabling 2 or more blocks to be joined by the slot/key interlock. The advantages of this feature are flexibility and the stocking of only 2 and 3 pole blocks.
□: **Terminal body accommodating 22-12 AWG:** also available for types: 977 DS, 977 OPDS. It allows the connection of several conductors per pole.

Extra Features: Screen print marking, adhesive labeling strips. Blocks can ben supplied without wire protector. Most types can be supplied with solder pins exceeding their standard length and up to 75mm/3 in. long. Brass screws, tin-plated wire protectors, Screws contacts and 2 P.C. pins per pole, 1 screw contact and 2 P.C. pins per pole.

Mill Spec: Various mil-specified insulating materials can be provided upon request.

Moulding: Glass fibre reinforced Polyamide 6.6, grey color
Upper temperature limit: short-time 200°C/392°F
continuous 100-120°C/212-248°F Cold resistant to: — 50°C/ — 58°F

Terminal Body: Tin-plated Brass

Soldering Pin: Tin-plated copper, for excellent solderability (figures 1, 3, 4)
Tin-plated brass, for excellent solderability (figure 2)

Wire Protector: Copper alloy. **Screw:** Zinc-plated steel, yellow chromated

HOW TO ORDER: Indicate Type and No. of Circuits, e.g.: 950 DS-12 is type 950 DS with 12 circuits.

WECO® PLUG-IN SCREW CONNECTOR SYSTEMS FOR PRINTED CIRCUIT BOARDS

Figure No. 1
Horizontal Version

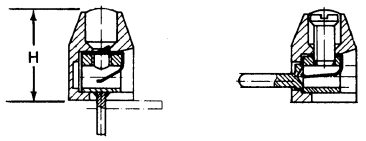


Figure No. 2
Vertical Version

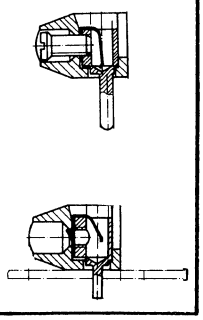
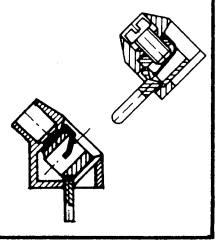
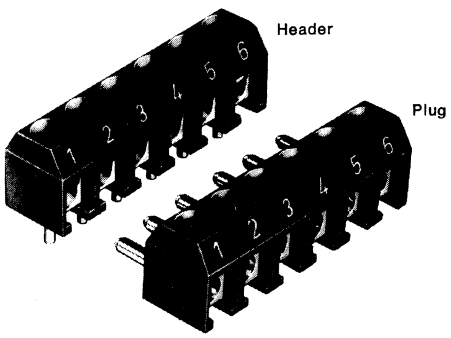


Figure No. 3
45° angled Version





International Approvals: VDE rated 0110

Types		No. of circuits	Block length = No. of circuits x pitch		Height(H)		Width(W)		Wire Entrance relative to PCB:			Plug-in direction relative to PCB:			UL recognized for: File No.: E69841			CSA approved for: File No.: LR24322			Design similar to Figure No.:
Plug	Header		mm	in	mm	in	mm	in	hori-zontal	verti-cal	45°	hori-zontal	verti cal	45°	Volt-age	Amper-age	AWG	Volt-age	Amper-age	AWG	
941 SVDS with	940 FB°	2-32*Δ 2-32*Δ	5.08 5.08	0.200 0.200	11.5 11.5	0.45 0.45	8 8	0.31 0.31	X			X			250	6	16-22	300	10	14-26	1
951 SVDS with	950 FB°	2-32*Δ 2-32*Δ	5 5	0.197 0.197	10 10	0.39 0.39	8 8	0.31 0.31	X			X			250	6	16-22	300	10	14-26	1
961 SVDS with	960 FB°	2-32Δ 2-32Δ	5.08 5.08	0.200 0.200	13.5 13.5	0.53 0.53	9 9	0.35 0.35	X			X			300	10	12-22	300	10	14-26	1
971 SVDS with	970 FB°	2-32Δ 2-32Δ	5 5	0.197 0.197	13 13	0.51 0.51	9 9	0.35 0.35	X			X			300	10	12-22	300	10	14-26	1
941 SVDS with	941 FB°	2-32*Δ 2-32*Δ	5.08 5.08	0.200 0.200	Complete ensemble: 16	0.63	8	0.31		X			X		250	6	16-22	300	10	14-26	2
951 SVDS with	951 FB°	2-32*Δ 2-32*Δ	5 5	0.197 0.197	Complete ensemble: 16	0.63	8	0.31		X			X		300	10	12-22	300	10	14-26	2
961 SVDS with	961 FB°	2-32Δ 2-32Δ	5.08 5.08	0.200 0.200	Complete ensemble: 18	0.71	9	0.35		X			X		300	6	14-22	300	10	14-26	2
971 SVDS with	971 FB°	2-32Δ 2-32Δ	5 5	0.197 0.197	Complete ensemble: 18	0.71	9	0.35		X			X		300	10	12-22	300	10	14-26	2
951 SVDS with	974 FB°	2-32*Δ 2-26*	5 5	0.197 0.197	Complete ensemble: 16.5	0.65	15.5	0.60			X			X	300	6	14-22	250	10	14-26	3

°: soldered onto PC-board, the counterpart is removable.

*: terminal block can be butted side by side to form any requested pole configuration without losing cente-to-center spacing.

Δ: A2 and 3 pole version of the block is available featuring the Dovetail Interlocking System, enabling 2 or more blocks to be joined by the slot/key interlock. The advantages of this feature are flexibility and the stocking of only 2 and 3 pole blocks.

Based on the standard program of screw-connectors for printed circuits an unmatched line of Plug-In Systems are available. A stainless steel spring provides the contact pressure to ensure a reliable connection not only to the plug, but also to other components. All systems offered provide for a quick connect and disconnect of wiring to PCB. There are many advantages and benefits to using these components:

- Subassemblies manufactured at different places are equipped with either the plug or header of the selected WECO plug-in screw-connector system. At the time the final assembly is to be finished one has only to insert the plug into the header. No more wiring is necessary.
- Peripheral appliances can be connected to the main PC-board avoiding risk of changing wires by mistake.
- For service purposes a PC-board can easily be disconnected. The plug may then be used for testing the PC-board.
- The plug also connects onto the PC-board, when direct wiring into a screw-connector is difficult because of limited space.
- Service-ability.

Moulding: Glassfibre reinforced Polyamide 6.6, grey color.
Upper temperature limit: short time: 200°C/392°F
continuous: 100-120°C/212-248°F
Cold resistant to: −50°C/−58°F

Terminal Body of Plng: Nickel-plated brass
Spring: Stainless steel strip
Terminal Body of Header: Tin-plated brass
Soldering Pin: Tin-plated copper, for excellent solderability (figures 1 and 3)
Tin-plated brass, for excellent solderability (fig. 2).
Wire Protector: Copper alloy
Screw: Zinc-plated steel, yellow chromated.

Extra Features: Screen print marking; Adhesive labelling strips; Blocks can be supplied without wire protector; Interlocking plates are available to additionally interlock each assembly, to increase creepage distance to panel and provide absolute sure connection in vibration treated environment. Brass screws, tin-plated wire protectors. Headers of figures 1 and 3 can be supplied with solder pins exceeding their standard lenght up to 75mm/3 inch long.

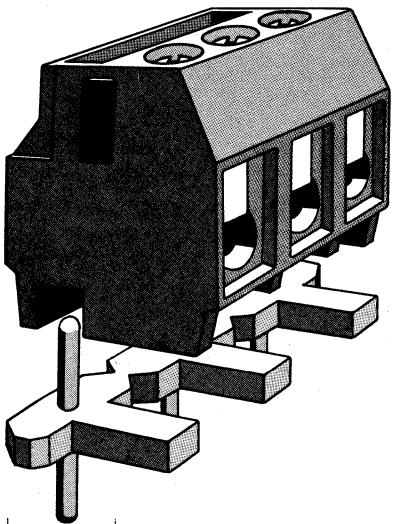
Mil Spec: Various mil-specified insulating materials can be provided upon request.

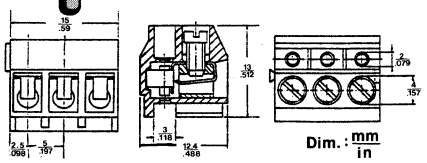
How To Order: Please indicate type and no. of circuits, e.g.: 951 SVDS-05 and 950 FB-05. This is the pluggable arrangemet of type 951 SVDS and 950 FB, with each 5 circuits per strip.

USA
WECO Electrical Connectors Inc.
Trimex Building, Rt. 11
Mooers, NY 12958
Phone: (518) 298-4810 — FAX: (518) 298-5938

CANADA
WECO Electrical Connectors Inc.
16805 Hymus Blvd.
Kirkland, Que. H9H 3L4
Phone: (514) 694-9136 — (514) 694-0518 — FAX: (514) 694-0956

WECO® PLUG-IN SCREW CONNECTORS FOR PRINTED CIRCUITS TYPE 950-FLDS 2,3 AND 8 POLES





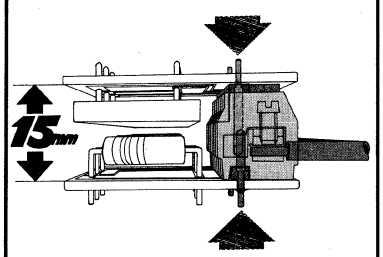
The female plug 950-FLDS is available with 2, 3 and 8 poles per strip. This series has the dovetail interlocking system which makes it possible to combine to any required number of poles. The mating male plugs may be individual solder pins LST-1,3×6,5 or Pin Strips 971-SLW (insertion from the top). Other versions on demand.

Pin strip and connector base design provide directional orientation when mating the two parts. A specially shaped contact spring, with integral wire protector, ensures a secure contact with relatively small insertion and removal forces.

The female plug features captive screws.

Poles	Art. No. female plug 950-FLDS	Length (L) w/o 0.7 mm dovetail mm	in	Art. No. single pin LST-1,3×6,5	Art. No. single pin LST-1,3×8	Art. No. pin strip 64 poles 971-SLW
2	20.871.702	10	0.39	12.477.513	10.477.514	74.893.603
3	20.871.703	15	0.59			
8	20.871.708	40	1.58			

Marker Strip	Art. No.
BST 5.00 / 12 marked 1-12	24.499.009
BST 5.00 / 32 marked 1-32	24.499.010



The drawing illustrates the versatility of this connector. One can insert from the top, or from below. In fact, with offset pins, one can connect two PCB's simultaneously with one terminal strip.

Technical Data

Center-to-Center Spacing : 5mm / 0.197 in to DIN 40801

Nominal Cross-Section : 1,5mm² (max.) / 22-14 AWG Cu

Rated Voltage : 600V to VDE 0110, in combination with Pin Strip 971-SLW; pollution degree 2, Creep path distance and air gap > 3,2mm / 0.13in. In combination with single Pins LST; pollution degree 1, Creep path distance and air gap > 2,5mm / 0.10in.

Breakdown voltage : > 2500V

Rated Current : 6A

Stripping Length : 6mm / 0.24in

Recommended Hole ϕ in P.C. Board :
LST 1,50mm / 0.06 in
971-SLW 1,30mm / 0.05 in

International Approvals :
UL : 300V, 10A, 22-14 AWG File No : E69841
CSA : 300V, 10A, 22-14 AWG File No : LR24322

Material

Moulding :
Break resistant polyamide, self-extringuishing, grey colour

Upper Temperature Limits :
short-time 140-160°C / 284-320°F
continuous 80-100°C / 176-212°F
cold-resistant −40°C / −40°F

Leakage current Resistance : CTI > 600

Terminal Body : tin plated brass

Wire Protector / Spring : tin plated copper alloy.

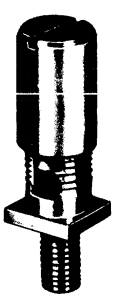
Single Pins LST : ϕ 1,3 mm, /0.05 in. silver plated brass

Pin Strip 971-SLW : ϕ 1mm / 0.04 in.

Screw : M 2.6 zinc plated steel,
Tightening Torque max : 0,4 Nm / 3.5 lb-in.

Options :
- Consecutive numbering (Print).
- Special marking to customer requirements (Print). Please provide sketch when ordering.
- Self-adhesive marker strips.

INTRINSICALLY SAFE TERMINALS



Type DFG

Type DFB

Application : Ground Terminals, especially where extremely safe connections are required. Examples are high vibration areas, machinery, corrosive atmosphere and hazardous locations.

Material : Nickel plated solid brass.

Sizes : A large variety is available and they can be mounted on ceramic bases.

Clamping Wire Gauges : 14 AWG – 5 / 0 AWG.

These terminals conform to VDE, Euro Norm Regulations and other rigid industrial standards.

Please request a complete catalog for additional information.

CERAMIC TERMINAL BLOCK — TYPE 560 K4DFV2A

for extreme environment and high temperature

Block Size	Length	Width	Height
mm	40	32	20
in.	1.57	1.26	0.79

Mounting Hole Diameter : 4.5mm / .18″

Mounting Rail : Width : 16mm / .63″; Thickness : 3mm / .12″

Material : Base : Steatite, KER 220 DIN 40685
Terminal : Stainless Steel
Binding Screw-Binding Clips-Washer : Stainless Steel

Withstands temperature of up to 500°C / 940°F.

UL : 300V, 600V with insulating base, 20A, 20-12 AWG.

File : E69841.

CSA : 300V, 25A, 20-12 AWG / 600V, 5A, 20-12 AWG.

File : LR 24322.

Please request a complete catalog for additional information.

USA
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Trimex Building, Rt. 11
Mooers, NY 12958
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CANADA
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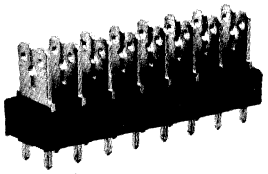
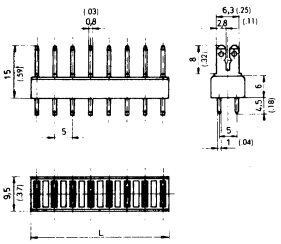
16805 Hymus Blvd.
Kirkland, Que. H9H 3L4
Phone : (514) 694-9136 – (514) 694-0518 – FAX : (514) 694-0956

WECO® TAB TYPE CONNECTORS FOR PRINTED CIRCUITS

900 S





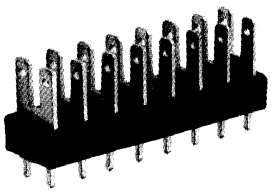
Connection Data:

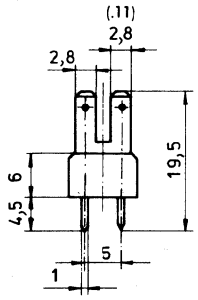
2 tabs each: 2.8 mm X 0.8 mm per DIN 46247/0.11" X 0.03"

or

1 tab: 6.3 mm X 0.8 mm per DIN 46247/0.25" X 0.03"

900 SH

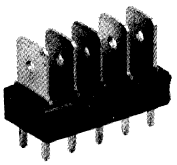


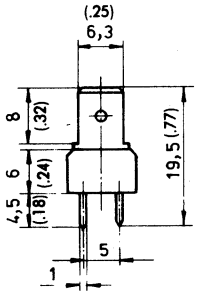


Connection Data:

2 fully insulated tabs each: 2.8 mm X 0.8 mm per DIN 46247/0.11" X 0.03"

900 SUN

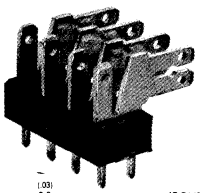


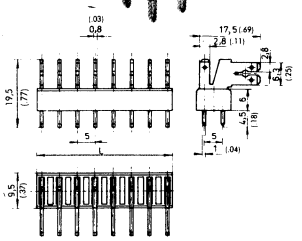


Connection Data:

1 tab: 6.3 mm X 0.8 mm per DIN 46247/0.25" X 0.03"

900 W





Connection Data:

Horizontal tab:

2 tabs each: 2.8 mm X 0.8 mm per DIN 46247/0.11" X 0.03" **or**

1 tab: 6.3 mm X 0.8 mm per DIN 46247/0.25" X 0.03"

Vertical tab:

1 tab: 2.8 mm X 0.8 mm per DIN 46247/0.11" X 0.03"

Series 900 tab type connectors offer the advantage of using receptacle equipped conductors for quick connecting and disconnecting to printed circuit boards. Instead of individually inserting the quick connect blades onto the printed circuit board, the 900 Series combines the required number of tabs into a strip. This eases the handling and cuts down on assembly time and cost. The quick connect blades come in various styles and types to meet your required plug-in directions. Apart from the standard pitch of 5, 7.5 and 10 mm, individual poles are available with regard to pitch and plug-in direction. All quick connect blades feature double pin soldering and are tightly inter-locked into the polyamide insulation housing. This ensures a reliable relief for the solder points when fitting and removing receptables.

VDE rated 0110

Type	Pitch in mm	No. of circuits available	UL recognized for: (File No. E69841)	CSA approved for: (File No. LR24322)	VDE rated 0110 (8A with 0.11"receptacle, 15A with 0.25" receptacle per DIN 46249)
900 S	5	2-32	125V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	250V Insulation Group B
900 S	7.5	2-21	250V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	380V Insulation Group C
900 S	10	2-16	250V, 15A	300V, 10A or 150V, 15A, 20-16 AWG	500V Insulation Group C
900 SH	5	2-32	125V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	250V Insulation Group B
900 SH	7.5	2-21	250V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	380V Insulation Group C
900 SH	10	2-16	250V, 15A	300V, 10A or 150V, 15A, 20-16 AWG	500V Insulation Group C
900 SUN	5	2-32	125V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	250V Insulation Group B
900 SUN	7.5	2-21	250V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	380V Insulation Group C
900 SUN	10	2-16	250V, 15A	300V, 10A or 150V, 15A, 20-16 AWG	500V Insulation Group C
900 W	5	2-32	125V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	250V Insulation Group B
900 W	7.5	2-21	250V, 15A	300V, 10A or 50V, 15A, 20-16 AWG	380V Insulation Group C
900 W	10	2-16	250V, 15A	300V, 10A or 150V, 15A, 20-16 AWG	500V Insulation Group C

Block Length = No. of circuits X pitch

Material:

Moulding: Polyamide 6, grey color
Upper Temperature Limit:
short-time 140-160°C/284-320°F
continuous 80-100°C/176-212°F
cold resistant to −40°C/−40°F
Tab: tin-plated brass
Recommended Hole Diameter in P.C. Board: 1.3 mm/0.051".

Available Options:

Consecutive numbering
Special marking to customer requirements. Please provide sketch when ordering.
Customized pitch and/or mixed usage of tabs on one strip. Please provide sketch when ordering.
Insulating Sleeves to insulate receptacles.

How to Order

Indicate type and no. of circuits,
e.g. 900 S5-12 is type 900 S with 5 mm spacing and 12 circuits.

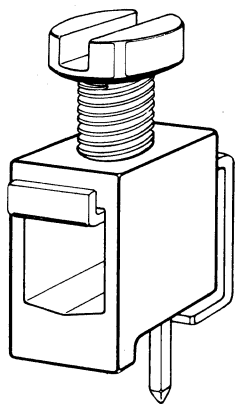
USA
WECO Electrical Connectors Inc.
Trimex Building, Rt. 11
Mooers, NY 12958
Phone: (518) 298-4810 — FAX: (518) 298-5938

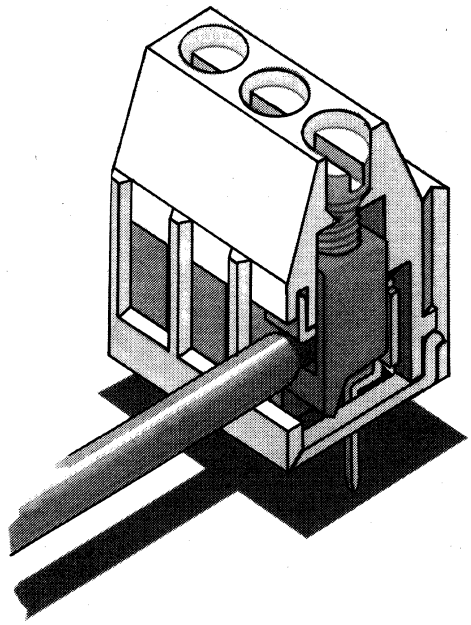
CANADA
WECO Electrical Connectors Inc.
16805 Hymus Blvd.
Kirkland, Que. H9H 3L4
Phone: (514) 694-9136 — (514) 694-0518 — FAX: (514) 694-0956

WECO® SCREW CONNECTORS FOR PRINTED CIRCUITS

Series 150 Multilift VDE rated 0110

General Description:





General

These connectors with extra large clamping area have a lift-terminal which garantees a high pressure fitting and a fatigue strength wire protection even after countless disconnections.

All types have captive screws and a dovetail interlocking system with 2 or 3 poles per strip.

Having to keep on the shelf only two block sizes, they can be combined to any requested strip size, ensuring perfect support and precise alignment.

The center-to-center spacing is 5 mm/0.197 in.

Two types have a test hole for a test plug with a diameter of 2,3 mm/0.09 in. For various types including a double level version with high conductor density please see the following pages.

All blocks will be shipped unmarked at standard. Special marking or longer P.C. Pins are available on request.

Technical Data

Center-to-Center Spacing:
5,00 mm/0.197 in

Nominal Cross-Section:
4,0 mm^2/26-12 AWG Cu
or
2x2, 5 mm^2/26-14 AWG Cu

Tracking Distance & Air Gap:
>3,0 mm/0.12 in ≙ 380 V
to VDE 0110, Insulation Group B

Breakdown Voltage: >2500 V

Stripping Length: 8,00 mm/0.31 in

Recommended Hole Diameter in P.C. Board: 1,30 mm/0.05 in

Material

Moulding: Break resistant polyamide, self-extinguishing, grey color

Upper Temperature Limits:
short-time 140-160°C/284-320°F
continuous 80-100°C/176-212°F
cold-resistant -40°C/-40°F

Terminal Body: nickel-plated brass

Pressure Bow-P.C. Pin: tin-plated brass

P.C. Pin Profile: 1x0,8 mm/0.04x0.03 in

Screw: M 3
zinc-plated steel,
yellow chromated
tightening torque 4.5 lb/in.

Electrical Specifications

Center-to-Center Spacing:
5,00 mm/0.197 in to DIN 40801

Rated Voltage: 380 V
to VDE 0110, Insulation Group B

Nominal Cross-Section:
4,0 mm^2/26-12 AWG Cu
or
2x2, 5 mm^2/26-14 AWG Cu

Rated Current: at room temperature:
15 A
to VDE 0100 part 523 Sched. 2 Gr. 3.
Based on a P.C. Pin profile of
1x0,8 mm/0.44x0.03 in ≙ 0,8 mm^2

Depending on application, relevant equipment safety regulations must be observed.

International Approvals

UL: 300V, 20A,
26-12 AWG Cu.
File No. E69841

CSA: 300V, 10A,
26-10 AWG Cu.
File No. LR 24322

Available Options

- Consecutive numbering (Print).
- Special marking to customer requirements (Print). Please provide sketch when ordering.
- Longer P.C. Pins.
- Center-to-Center spacing of 10 mm/0.394 in.

How to order:

Use the 8 digit
article No. to order parts.

USA
WECO Electrical Connectors Inc.
Trimex Building, Rt. 11
Mooers, NY 12958
Phone: (518) 298-4810 — FAX: (518) 298-5938

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16805 Hymus Blvd.
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Phone: (514) 694-9136 — (514) 694-0518 — FAX: (514) 694-0956

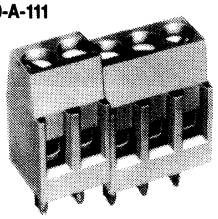
WECO® PLUG-IN SCREW CONNECTORS FOR PRINTED CIRCUITS

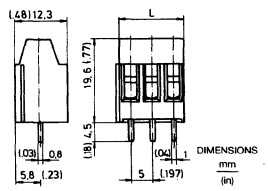
Series 150 Multilift VDE rated 0110

Types 150-A-111 and 150-A-121

5 mm 2 and 3 poles

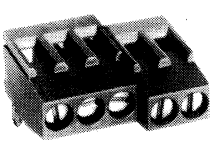
150-A-111

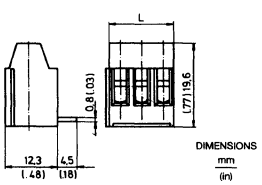




Poles	Art.-No. 150-A-111	Length (L) mm	in
2	**10.801.002**	10	0.39
3	**10.801.003**	15	0.59

150-A-121



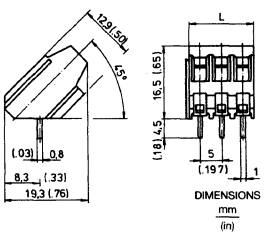


Poles	Art.-No. 150-A-121	Length (L) mm	in
2	**20.801.002**	10	0.39
3	**20.801.003**	15	0.59

Types 150-C-111 and 150-B-111

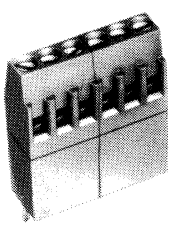
5 mm 2 and 3 poles

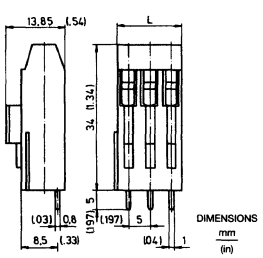
150-C-111



Poles	Art.-No. 150-C-111	Length (L) mm	in
2	**10.801.022**	10	0.39
3	**10.801.023**	15	0.59

150-B-111

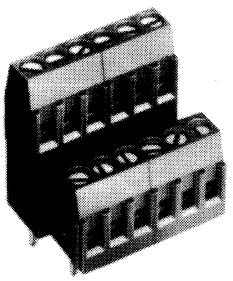




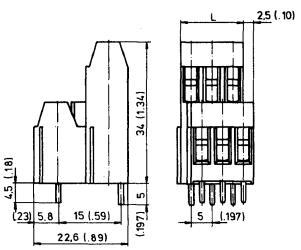
Poles	Art.-No. 150-B-111	Length (L) mm	in
2	**10.801.014**	10	0.39
3	**10.801.016**	15	0.59

Type 150-B-151

5 mm 4 and 6 poles



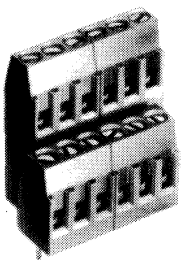
Rear row transposed to left by half a pitch.



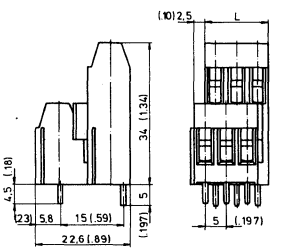
Poles	Art.-No. 150-B-151	Length (L) mm	in
4	**30.801.014**	12,5	0.49
6	**30.801.016**	17,5	0.69

Type 150-B-153

5 mm 4 and 6 poles

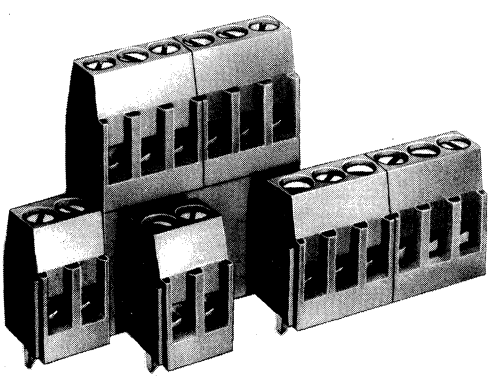


Rear row transposed to right by half a pitch.



Poles	Art.-No. 150-B-153	Length (L) mm	in
4	**40.801.014**	12,5	0.49
6	**40.801.016**	17,5	0.69

Special Assemblies of Types 150-A-111 and 150-B-111



Assembly example

When ordering Types 150-A-111 and 150-B-111 individual assemblies can be composed.

USA
WECO Electrical Connectors Inc.
Trimex Building, Rt. 11
Mooers, NY 12958
Phone: (518) 298-4810 — FAX: (518) 298-5938

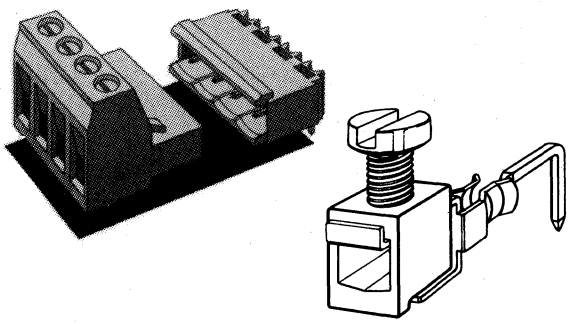
CANADA
WECO Electrical Connectors Inc.
16805 Hymus Blvd.
Kirkland, Que. H9H 3L4
Phone: (514) 694-9136 — (514) 694-0518 — FAX: (514) 694-0956

WECO® PLUG-IN SCREW CONNECTORS FOR PRINTED CIRCUITS

Series 120 Conecta

VDE rated 0110

General Description:



General

This Plug-in Screw Connector System is available in various possible combinations.

A reliable connection is provided at the screw side with a lift-terminal and at the plug in side with a locked contact. The lift-system ensures a high pressure fitting and a fatigue strength wire protection even after countless disconnections.

All types have captive screws and are available with 2-24 poles per strip. They can be installed end-to-end while maintaining center-to-center spacing of 5 mm/0.197 in.

Mounting ears for terminals with side wall and special terminals with keying pins for coding without loss of poles are available on request.

All blocks will be shipped unmarked as standard.

Special marking or longer P.C. Pins are available on request.

Electrical Specifications

Center-to-Center Spacing:
5,00 mm/0.197 in to DIN 40801

Rated Voltage: 380 V
to VDE 0110, Insulation Group B

Nominal Cross-Section:
1,5 mm²/26-14 AWG Cu

Rated Current: at room temperature:
12 A

Depending on application, relevant equipment safety regulations must be observed.

Technical Data

Center-to-Center Spacing:
5,00 mm/0.197 in

Nominal Cross-Section:
1,5 mm²/26-14 AWG Cu

Tracking Distance & Air Gap:
>3,0 mm/0.12 in ≙ 380 V
to VDE 0110, Insulation Group B

Breakdown Voltage: >2500 V

Stripping Length: 7,00 mm/0.28 in

Recommended Hole Diameter in P.C. Board: 1,40 mm/0.06 in

International Approvals

UL: 300V, 10A
26-14 AWG Cu.
File No. E69841

CSA: 300V, 10A,
26-12 AWG Cu.
File No. LR 24322

Material

Moulding: Break resistant polyamide, self-extinguishing, grey color

Upper Temperature Limits:
short-time 140-160°C/284-320°F
continuous 80-100°C/176-212°F
cold-resistant -40°C/-40°F

Resistance to Tracking:
Non-tracking factor KB >600

Terminal Body: nickel-plated brass

Contact Spring: tin-plated bronze

P.C. Pin: □1 mm/0.04 in ≙ 1 mm² tin-plated brass

Screw: M 3
zinc-plated steel, yellow chromated
tightening torque 4.5 lb/in.

Available Options

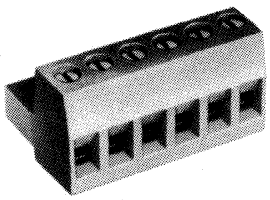
- Consecutive numbering (Print).
- Special marking to customer requirements (Print).
  Please provide sketch when ordering.
- Longer P.C. Pins.
- Mounting ears for terminals with side wall.
- Terminals for coding with keying pins without loss of poles.
- Fixing flanges for terminals with keying pins without loss of poles.

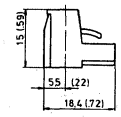
How to order:

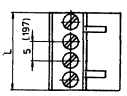
Use the 8 digit article No. to order parts.

Type 120-A-111

5 mm 2-24 poles





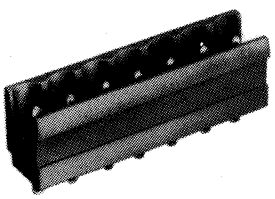


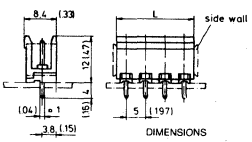
DIMENSIONS mm (in)

Poles	Art.-No. 120-A-111	Length (L) mm	Length (L) in
2	10.808.002	10	0.39
3	10.808.003	15	0.59
4	10.808.004	20	0.79
5	10.808.005	25	0.98
6	10.808.006	30	1.18
7	10.808.007	35	1.38
8	10.808.008	40	1.57
9	10.808.009	45	1.77
10	10.808.010	50	1.97
11	10.808.011	55	2.17
12	10.808.012	60	2.36
13	10.808.013	65	2.56
14	10.808.014	70	2.76
15	10.808.015	75	2.95
16	10.808.016	80	3.15
17	10.808.017	85	3.35
18	10.808.018	90	3.54
19	10.808.019	95	3.74
20	10.808.020	100	3.94
21	10.808.021	105	4.13
22	10.808.022	110	4.33
23	10.808.023	115	4.53
24	10.808.024	120	4.72

Types 120-M-221 and 120-M-121

5 mm 2-24 poles





DIMENSIONS mm (in)

Poles	Art.-No. 120-M-221 with side wall	Art.-No. 120-M-121 without side wall	Length (L) with side wall: plus 1,6 mm/0.06 in mm	Length (L) in
2	20.806.026	20.806.002	10	0.39
3	20.806.027	20.806.003	15	0.59
4	20.806.028	20.806.004	20	0.79
5	20.806.029	20.806.005	25	0.98
6	20.806.030	20.806.006	30	1.18
7	20.806.031	20.806.007	35	1.38
8	20.806.032	20.806.008	40	1.57
9	20.806.033	20.806.009	45	1.77
10	20.806.034	20.806.010	50	1.97
11	20.806.035	20.806.011	55	2.17
12	20.806.036	20.806.012	60	2.36
13	20.806.037	20.806.013	65	2.56
14	20.806.038	20.806.014	70	2.76
15	20.806.039	20.806.015	75	2.95
16	20.806.040	20.806.016	80	3.15
17	20.806.041	20.806.017	85	3.35
18	20.806.042	20.806.018	90	3.54
19	20.806.043	20.806.019	95	3.74
20	20.806.044	20.806.020	100	3.94
21	20.806.045	20.806.021	105	4.13
22	20.806.046	20.806.022	110	4.33
23	20.806.047	20.806.023	115	4.53
24	20.806.048	20.806.024	120	4.72

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WECO®

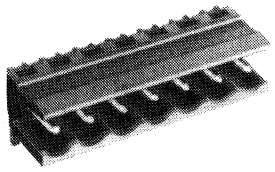
PLUG-IN SCREW CONNECTORS FOR PRINTED CIRCUITS

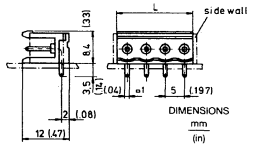
Series 120 Conecta

VDE rated 0110

Types 120-M-211 and 120-M-111

5 mm 2-24 poles

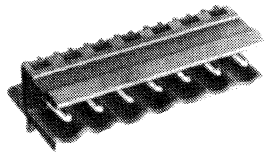




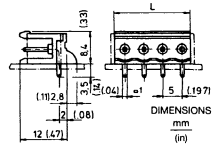
Poles	Art.-No. 120-M-211 with side wall	Art.-No. 120-M-111 without side wall	Length (L) with side wall: plus 1,6 mm/ 0.06 in mm	in
2	10.806.026	10.806.002	10	0.39
3	10.806.027	10.806.003	15	0.59
4	10.806.028	10.806.004	20	0.79
5	10.806.029	10.806.005	25	0.98
6	10.806.030	10.806.006	30	1.18
7	10.806.031	10.806.007	35	1.38
8	10.806.032	10.806.008	40	1.57
9	10.806.033	10.806.009	45	1.77
10	10.806.034	10.806.010	50	1.97
11	10.806.035	10.806.011	55	2.17
12	10.806.036	10.806.012	60	2.36
13	10.806.037	10.806.013	65	2.56
14	10.806.038	10.806.014	70	2.76
15	10.806.039	10.806.015	75	2.95
16	10.806.040	10.806.016	80	3.15
17	10.806.041	10.806.017	85	3.35
18	10.806.042	10.806.018	90	3.54
19	10.806.043	10.806.019	95	3.74
20	10.806.044	10.806.020	100	3.94
21	10.806.045	10.806.021	105	4.13
22	10.806.046	10.806.022	110	4.33
23	10.806.047	10.806.023	115	4.53
24	10.806.048	10.806.024	120	4.72

Types 120-M-411 and 120-M-311

5 mm 2-24 poles



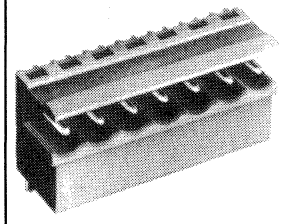
Features additional protection against strain bending for the solder joints through extended base.

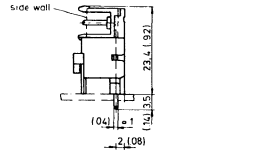


Poles	Art.-No. 120-M-411 with side wall	Art.-No. 120-M-311 without side wall	Length (L) with side wall: plus 1,6 mm/ 0.06 in mm	in
2	10.806.426	10.806.402	10	0.39
3	10.806.427	10.806.403	15	0.59
4	10.806.428	10.806.404	20	0.79
5	10.806.429	10.806.405	25	0.98
6	10.806.430	10.806.406	30	1.18
7	10.806.431	10.806.407	35	1.38
8	10.806.432	10.806.408	40	1.57
9	10.806.433	10.806.409	45	1.77
10	10.806.434	10.806.410	50	1.97
11	10.806.435	10.806.411	55	2.17
12	10.806.436	10.806.412	60	2.36
13	10.806.437	10.806.413	65	2.56
14	10.806.438	10.806.414	70	2.76
15	10.806.439	10.806.415	75	2.95
16	10.806.440	10.806.416	80	3.15
17	10.806.441	10.806.417	85	3.35
18	10.806.442	10.806.418	90	3.54
19	10.806.443	10.806.419	95	3.74
20	10.806.444	10.806.420	100	3.94
21	10.806.445	10.806.421	105	4.13
22	10.806.446	10.806.422	110	4.33
23	10.806.447	10.806.423	115	4.53
24	10.806.448	10.806.424	120	4.72

Types 120-M-281 and 120-M-181

5 mm 2-24 poles

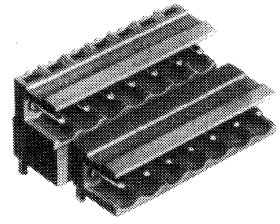


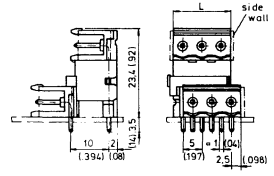


Poles	Art.-No. 120-M-281 with side wall	Art.-No. 120-M-181 without side wall	Length (L) with side wall: plus 1,6 mm/ 0.06 in mm	in
2	25.806.076	25.806.052	10	0.39
3	25.806.077	25.806.053	15	0.59
4	25.806.078	25.806.054	20	0.79
5	25.806.079	25.806.055	25	0.98
6	25.806.080	25.806.056	30	1.18
7	25.806.081	25.806.057	35	1.38
8	25.806.082	25.806.058	40	1.57
9	25.806.083	25.806.059	45	1.77
10	25.806.084	25.806.060	50	1.97
11	25.806.085	25.806.061	55	2.17
12	25.806.086	25.806.062	60	2.36
13	25.806.087	25.806.063	65	2.56
14	25.806.088	25.806.064	70	2.76
15	25.806.089	25.806.065	75	2.95
16	25.806.090	25.806.066	80	3.15
17	25.806.091	25.806.067	85	3.35
18	25.806.092	25.806.068	90	3.54
19	25.806.093	25.806.069	95	3.74
20	25.806.094	25.806.070	100	3.94
21	25.806.095	25.806.071	105	4.13
22	25.806.096	25.806.072	110	4.33
23	25.806.097	25.806.073	115	4.53
24	25.806.098	25.806.074	120	4.72

Types 120-M-251 and 120-M-151

5 mm 4-48 poles



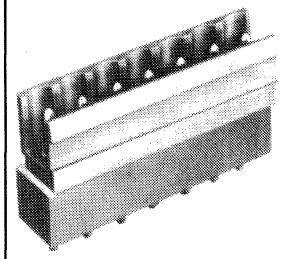


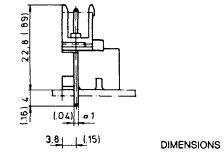
Poles	Art.-No. 120-M-251 with side wall	Art.-No. 120-M-151 without side wall	Length (L) with side wall: plus 1,6 mm/ 0.06 in mm	in
4	10.806.076	10.806.052	12,5	0.49
6	10.806.077	10.806.053	17,5	0.69
8	10.806.078	10.806.054	22,5	0.89
10	10.806.079	10.806.055	27,5	1.08
12	10.806.080	10.806.056	32,5	1.28
14	10.806.081	10.806.057	37,5	1.48
16	10.806.082	10.806.058	42,5	1.67
18	10.806.083	10.806.059	47,5	1.87
20	10.806.084	10.806.060	52,5	2.07
22	10.806.085	10.806.061	57,5	2.26
24	10.806.086	10.806.062	62,5	2.46
26	10.806.087	10.806.063	67,5	2.66
28	10.806.088	10.806.064	72,5	2.85
30	10.806.089	10.806.065	77,5	3.05
32	10.806.090	10.806.066	82,5	3.25
34	10.806.091	10.806.067	87,5	3.44
36	10.806.092	10.806.068	92,5	3.64
38	10.806.093	10.806.069	97,5	3.84
40	10.806.094	10.806.070	102,5	4.04
42	10.806.095	10.806.071	107,5	4.23
44	10.806.096	10.806.072	112,5	4.43
46	10.806.097	10.806.073	117,5	4.63
48	10.806.098	10.806.074	122,5	4.82

- Types 120-M-253 and 120-M-253 with rear row transposed to right by 2,5 mm.
- Special arrangements of front- and rear row.

Types 120-M-291 and 120-M-191

5 mm 2-24 poles

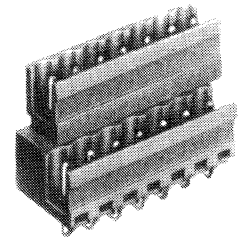


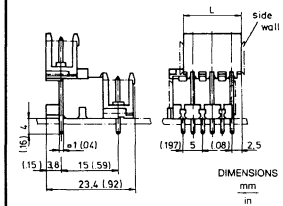


Poles	Art.-No. 120-M-291 with side wall	Art.-No. 120-M-191 without side wall	Length (L) with side wall: plus 1,6 mm/ 0.06 in mm	in
2	25.806.026	25.806.002	10	0.39
3	25.806.027	25.806.003	15	0.59
4	25.806.028	25.806.004	20	0.79
5	25.806.029	25.806.005	25	0.98
6	25.806.030	25.806.006	30	1.18
7	25.806.031	25.806.007	35	1.38
8	25.806.032	25.806.008	40	1.57
9	25.806.033	25.806.009	45	1.77
10	25.806.034	25.806.010	50	1.97
11	25.806.035	25.806.011	55	2.17
12	25.806.036	25.806.012	60	2.36
13	25.806.037	25.806.013	65	2.56
14	25.806.038	25.806.014	70	2.76
15	25.806.039	25.806.015	75	2.95
16	25.806.040	25.806.016	80	3.15
17	25.806.041	25.806.017	85	3.35
18	25.806.042	25.806.018	90	3.54
19	25.806.043	25.806.019	95	3.74
20	25.806.044	25.806.020	100	3.94
21	25.806.045	25.806.021	105	4.13
22	25.806.046	25.806.022	110	4.33
23	25.806.047	25.806.023	115	4.53
24	25.806.048	25.806.024	120	4.72

Types 120-M-261 and 120-M-161

5 mm 4-48 poles





Poles	Art.-No. 120-M-261 with side wall	Art.-No. 120-M-161 without side wall	Length (L) with side wall: plus 1,6 mm/ 0.06 in mm	in
4	30.806.076	30.806.052	12,5	0.49
6	30.806.077	30.806.053	17,5	0.69
8	30.806.078	30.806.054	22,5	0.89
10	30.806.079	30.806.055	27,5	1.08
12	30.806.080	30.806.056	32,5	1.28
14	30.806.081	30.806.057	37,5	1.48
16	30.806.082	30.806.058	42,5	1.67
18	30.806.083	30.806.059	47,5	1.87
20	30.806.084	30.806.060	52,5	2.07
22	30.806.085	30.806.061	57,5	2.26
24	30.806.086	30.806.062	62,5	2.46
26	30.806.087	30.806.063	67,5	2.66
28	30.806.088	30.806.064	72,5	2.85
30	30.806.089	30.806.065	77,5	3.05
32	30.806.090	30.806.066	82,5	3.25
34	30.806.091	30.806.067	87,5	3.44
36	30.806.092	30.806.068	92,5	3.64
38	30.806.093	30.806.069	97,5	3.84
40	30.806.094	30.806.070	102,5	4.04
42	30.806.095	30.806.071	107,5	4.23
44	30.806.096	30.806.072	112,5	4.43
46	30.806.097	30.806.073	117,5	4.63
48	30.806.098	30.806.074	122,5	4.82

- Types 120-M-263 and 120-M-163 with rear row transposed to right about 2,5 mm.

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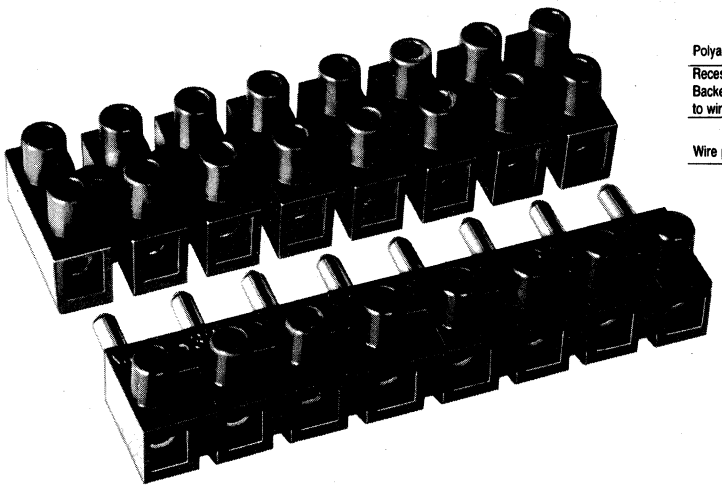
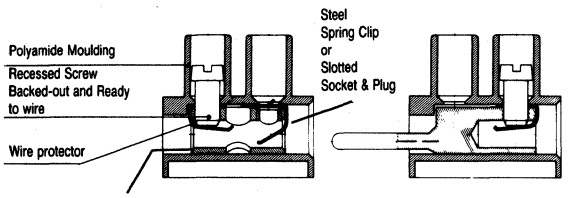
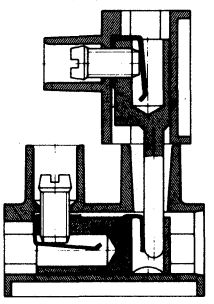
WECO® PLUG AND SOCKET SCREW-CONNECTOR SYSTEMS FOR PANEL/CHASSIS MOUNTING

Drawings see facing page.







International Approvals: **VDE rated 0110**

Plug and Socket Connectors are particularly suitable for installations where simple circuit closing and opening is required.
By pre-wiring various equipment sections, it is possible to use Plug and Socket Connectors to provide a quick and reliable connection at final assembly. Therefore wire confusion is avoided. Blocks can be coded (color coding, labelling, etc.) to ensure proper connection.

Some of these assemblies are available for printed circuit application. Standard strip has 12 circuits and can easily be field cut to required number of poles or ordered as required. A mounting hole is provided between each circuit. The terminal screws are backed out and ready for wiring. The dead front design is for safety and avoids short circuitry.

Each screw connection is equipped with a wire protector to prevent damage to the wire from the turning screw. The wire protector is a thin plate placed between screw and wire.

To obtain low contact resistances on connectors, a high contact pressure is required. This leads to relatively high withdrawal forces. To facilitate the assembly, we therefore recommend that from 7 poles onwards two male and one female plug and socket connector should be used.

For the protective conductor pole the connectors can be equipped with leading plugs or sockets on request. This means that the protective conductor connection is made first when plugging-in and disconnected last.

MATERIAL:

Moulding: Flexible natural Polyamide, white color
Terminal body: Nickel-plated brass
Spring: Stainless steel strip
Wire Protector: Copper alloy
Screw: Zinc-plated steel, yellow chromated
Upper temperature Limit:
short-time: 140-160°C / 284-320°F
continuous: 80-100°C / 176-212°F
cold-resistant to -40°C /-40°F

Connector Designation		No. of circuits	Length (with 12 circuits)		Contact pressure provided through:		UL recognized for (File #E69841)			CSA approved for (File #LR24322)			Screw Tightening Torque (lb/in)		Wire stripping length		Marker Strip Designation	
Male	Female		mm	in	Steel Spring	Slotted Plug and/or Socket	Voltage	Amperage	AWG	Voltage	Amperage	AWG	Male connector	Female connector	mm	in	For male connector	For female connector
302 SVDS	302 FBDS	1-12	95	3.87	X		250 ①	6	20-14	300	6	20-14	3.5	3.5	5	0.20	BST302	BST302
302 NSVDS	302 NFBDS	1-12	95	3.87	X		250 ①	6	20-14	—	—	—	3.5	3.5	5	0.20	BST302	BST302
302 STSDS	302 STBDS	1-12	95	3.87		X	250 ①	6	20-14	300	6	20-14	3.5	3.5	5	0.20	BST302	BST302
302 NSTSDS	302 NSTBDS	1-12	95	3.87		X	250 ①	6	20-14	—	—	—	3.5	3.5	5	0.20	BST302	BST302
321 SDS	321 BDS	1-12	1117	4.61		X	300	20	20-12	300/150	10/15	18-12	4.5	4.5	6	0.24	BST322	BST322
302 STFSDS	323 STFBDS	1-12	117	4.61		X	—	—	—	—	—	—	4.5	4.5	6	0.24	BST322	BST323
322 SVDS	323 FBHDS	1-12	117	4.61	X		250 ①	20	18-12	300/150	10/15	18-12	4.5	4.5	7	0.28	BST322	BST323
322 SVWDS	323 FBWDS	1-12	117	4.61	X		250 ①	20	18-12	300/150	10/15	18-12	4.5	4.5	7	0.28	BST322	BST323
322 SVWDS	323 PHFBWDS	1-12	117	4.61	X		—	—	—	300	20	18-12	4.5	4.5	7	0.28	BST322	BST322+BST323
324 STFSDS	324 STFBDS	1-12	135	5.31		X	250 ②	25	18-10	300	30	18-10	7	7	7.5	0.30	BST324	BST324

① 300V with insulating base
② 600V with insulating base

How To Order: Please indicate Connector Designation and No. of circuits requested. Complete assembly to be ordered would read as follows, e.g.: 302 SVDS-06: is male connector 302 SVDS with 6 circuits.
302 FBDS-06: is female connector 302 FBDS with 6 circuits
BST 302-06: is blank marker strip for six circuits. Shall marker strip be factory labelled, please provide sketch of marking arrangement.
Leading plug or socket for protective contact pole: Please provide sketch of required circuit configuration.

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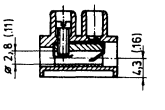
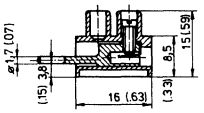
WECO® PLUG AND SOCKET SCREW-CONNECTOR SYSTEMS FOR PANEL/CHASSIS MOUNTING

Continued from facing page.

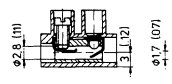
302 FBDS



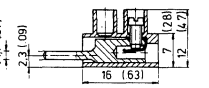
302 SVDS

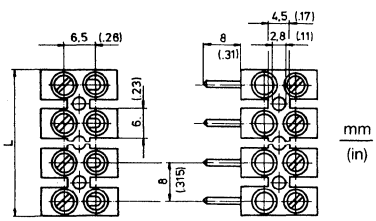


302 N FBDS

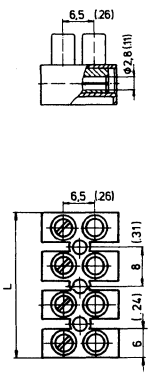


302 N SVDS





302 STBDS



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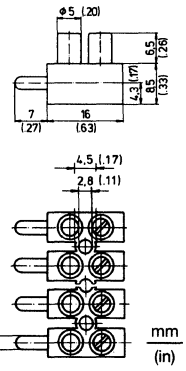
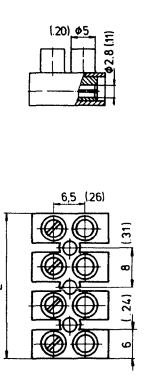
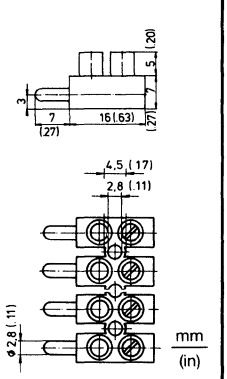


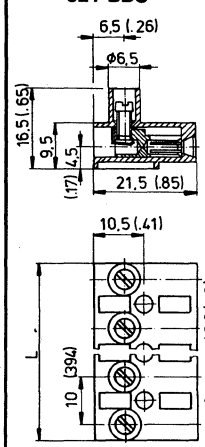
302 N STBDS



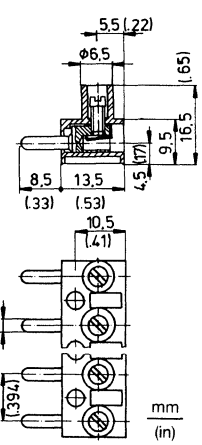
302 N STSDS



321 BDS



321 SDS



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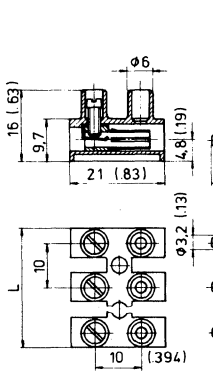

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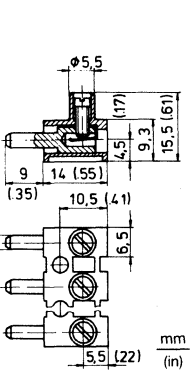
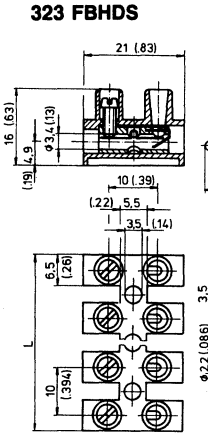
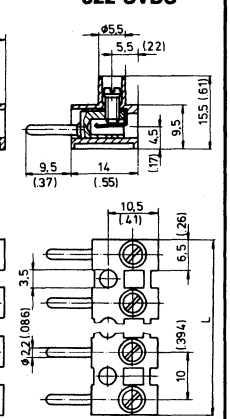


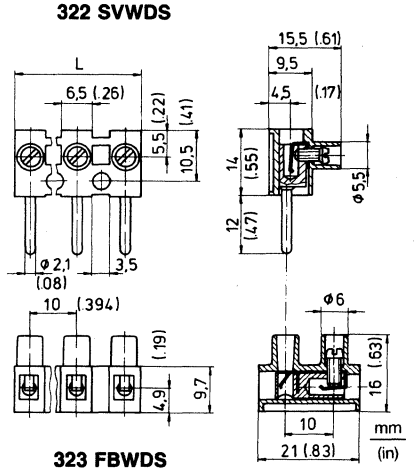
323 FBHDS



322 SVDS

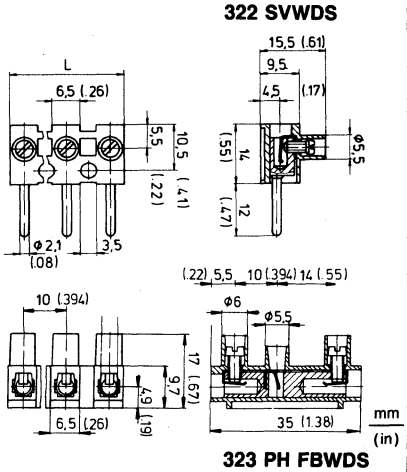


322 SVWDS



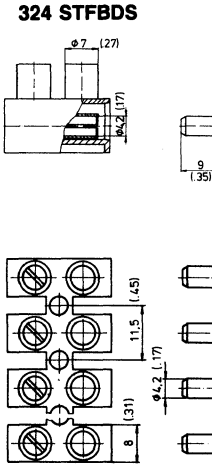
323 FBWDS

322 SVWDS

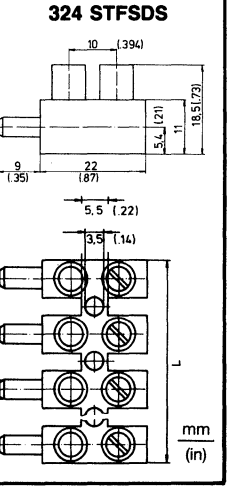


323 PH FBWDS

324 STFBDS



324 STFSDS



Inch dimensions (in brackets) for reference only; use metric dimensions for design purpose.

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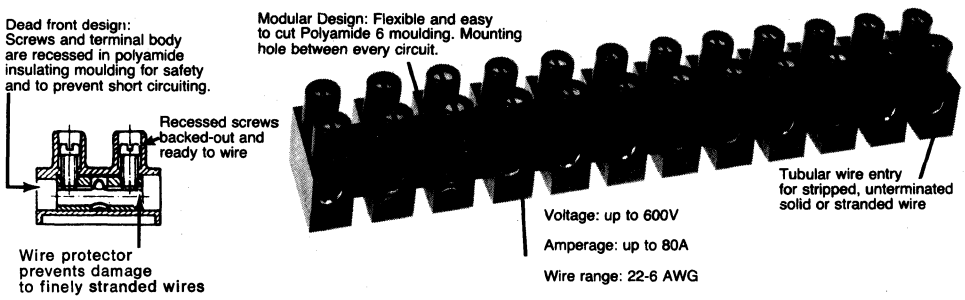
WECO® SOCKET TERMINAL STRIPS FOR PANEL/CHASSIS MOUNTING



High circuit density from 39-21 circuits per foot. Depending on product type selected.

International Approvals:

The terminal strips are used for connecting stripped, unterminated, stranded or solid copper wires; ranging from 22-6 AWG, depending on product type selected. Each strip has 12 circuits and can easily be field cut to the required number of poles. They can also be ordered factory-cut in any requested pole number.

A mounting hole is provided between each circuit. The terminal screws are backed-out and ready for wiring. The screws are protected against working loose and cannot fall out.

Each circuit has a wire protector to prevent damage to the wire from the turning screw. The wire protector is a thin steel plate placed between screw and wire. All metal parts of the terminal are completely recessed in the flexible polyamide 6 moulding. This dead-front design ensures safely and prevents short circuiting. Its flexible construction allows use on uneven surfaces. For proper circuit identification, we supply marker strips. They may either be factory numbered or individually marked with a felt pen. We can also mark on the block. The terminal strips meet most world approvals, including UL, CSA & VDE.

Terminal strip types 302 HDS and 323 HDS can be supplied with screw/solder lug connections. Please contact WECO for complete catalog.

How To Order: Please Indicate Type and No. of circuits requested, e.g.:
302 HDS-12 is terminal block 302 HDS with 12 circuits.
BST 302-12 is blank marker strip for twelve circuits. Shall marker strip be factory labelled, please provide sketch showing marking arrangement.

TECHNICAL DATA		TERMINAL STRIP TYPE									
		302NHDS	302HDS	323 HDS	323 FU16.5HDS	323 FU18.5HDS	324 HDS	324 FUHDS	326 HDS	327 HDS	327 FUHDS
Material:	Moulding:	Flexible natural polyamide, white color Upper temperature limit: Short-time 140-160°C/284-320°F Continuous 80-100°C/176-212°F Cold resistant to −40°C/−40°F									
	Terminal Body:	Nickel-plated brass									
	Wire Protector:	Stainless steel strip									
	Screw:	Zinc-plated steel, yellow chromated									
No. of Circuits		1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12	1-12
Length (with 12 circuits)	mm	94	94	117	117	117	135	135	171	171	171
	in	3.74	3.74	4.61	4.61	4.61	5.32	5.32	6.73	6.73	6.73
Height	mm	12	15	16	16	18.5	18.5	21.3	22.5	25	28.5
	in	0.472	0.59	0.63	0.63	0.73	0.73	0.84	0.89	0.98	1.12
Width	mm	16	16	21	21	21	22	22	30	30	30
	in	0.63	0.63	0.83	0.83	0.83	0.87	0.87	1.18	1.18	1.18
Center To Center Spacing	mm	8	8	10	10	10	11.5	11.5	14.5	14.5	14.5
	in	0.31	0.31	0.39	0.39	0.39	0.45	0.45	0.57	0.57	0.57
Screw Size		M2.6×5	M2.6×5	M3×5.5	M3×5.5	M3×5.5	M3.5×7	M3.5×7	M4×8	M5×10	M5×10
Mounting Hole Diameter	mm	2.8	2.8	3.5	3.5	3.5	3.5	3.5	4.3	4.3	4.3
	in	.11	.11	.14	.14	.14	.14	.14	.17	.17	.17
Spacing Through Air	mm	4.2	5.8	6.1	6.3	8.5	6.1	9.2	7.9	7.5	11
	in	.17	.23	.24	.25	.33	.24	.36	.31	.30	.43
Spacing Over Surface	mm	3.2	5.8	6.1	11.1	11.9	6.1	11.2	7.9	9.6	13.1
	in	.13	.23	.24	.44	.47	.24	.44	.31	.38	.52
Screw Tightening Torque: lb/in		3.5	3.5	4.5	4.5	4.5	7	7	10	16	16
Wire Stripping Length	mm	5	5	7	7	7	7.5	7.5	9	9	9
	in	0.20	0.20	0.28	0.28	0.28	0.30	0.30	0.35	0.35	0.35
UL recognized for (UL File No. E69841):											
Volt		300	250	250	250	250	250	300	250	300	600
Ampere		10	20	25	30	30	35	35	50	65	65
Wire Range (AWG)		20-12	20-12	20-10	20-10	20-10	14-8	14-8	14-8	14-6	14-6
CSA approved for (CSA File No. LR24322)											
Volt		300/50	300	300	300	600	150	600	150	300	600
Ampere		10/20	20	20	20	20	40	40	55	80	80
Wire Range (AWG)		20-14	20-14	18-12	18-12	18-12	18-10	18-10	14-6	14-6	14-6
Market Strip Designation		BST 302	BST 302	BST 323	BST 323	BST 323	BST 324	BST 324	BST 335	BST 335	BST 335

Available Options: • These basic products can be custom made for many applications
• Brass screws
• Blocks without wire protectors

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FAX: (415) 452-3620

BRILL ELECTRONICS

1220 Olympic Boulevard
Santa Monica, CA 90404
Tel: (213) 452-8002

(415) 834-5888

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- Omron
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- Sigma
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- Omron
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- Otto
- Switchcraft
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- Curtis
- Electrovert
- Magnum
- RDI
- Siemen
- USD
- Vernitron-Beau
- Weidmuller

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- Simpson Electric
- Triplett

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- Amperite
- Industrial Timer
- Magnecraft
- Master Electronics
- Midtex
- Omron
- Potter & Brumfield
- SSAC

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- Kester
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- Weller
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- Thordarson
- Triad
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- G.E.
- National
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- R.C.A.
- Varian (Klystrons)

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- Electrovert
- Heli-Tube
- Panduit

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- Belden
- Cablewave
- Carol
- Iboco
- Madison
- Manhattan
- Quabbin

Electrovert

Amphenol®

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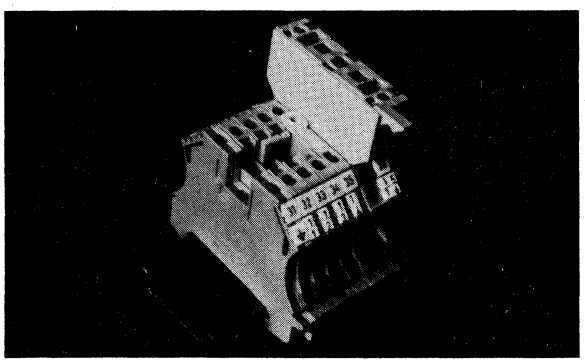
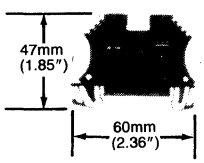
FEED THROUGH TERMINAL BLOCKS

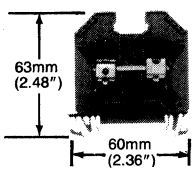
W SERIES



Size 2.5-10



Size 16-35



Weidmuller's W Series makes it simple to design modular terminal block assemblies.

FEATURES

- high density: 0.2 inches per block for AWG 12.
- only two profiles: reduces required accessories and gives you an easier-to-read marking area.
- completely insulated current-carrying components, even with jumper connections.
- expanded marking options, ideal for use with PLC circuitry.
- vibration-proof clamping system made from corrosion-resistant zinc-plated steel.
- moldings made of Wemid, a thermoplastic that combines a UL 94 V-O rating, an operating temperature range to 250°F, and the resilience of nylon.

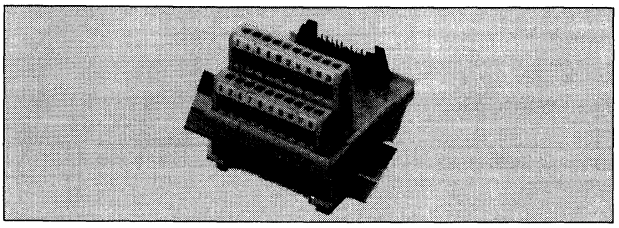
Weidmuller offers many other terminal blocks, including our popular SAK Series, a full line of terminal strips that mount directly to your panel, and specialty blocks including multi-level blocks, thermocouple blocks, etc. Call for details.

Feed-through Terminal Blocks	Type	AWG	Rating	Thickness	Cat. No.
	WDU 2.5	22-12	600V/25A	5mm (.197")	**10200.0**
	WDU 4	22-10	600V/35A	6mm (.236")	**10201.0**
	WDU 6	20-8	600V/45A	8mm (.315")	**10202.0**
	WDU 10	16-8	600V/60A	10mm (.394")	**10203.0**
	WDU 16	14-6	600V/70A	12mm (.472")	**10204.0**
	WDU 35	12-2	600V/115A	16mm (.630")	**10205.0**
Ground Terminal Blocks					
	WPE 2.5	22-12		5mm (.197")	**10100.0**
	WPE 4	22-10		6mm (.236")	**10101.0**
	WPE 6	20-8		8mm (.315")	**10102.0**
	WPE 10	16-8		10mm (.394")	**10103.0**
	WPE 16	14-6		12mm (.472")	**10104.0**
	WPE 35	12-2		16mm (.630")	**10105.0**
Fuse Terminal Blocks					
for 5mm fuses					
no LED indicator	WSI 6	20-8	300V/10A	8mm (.315")	**10110.0**
12VDC/10-28VAC LED	WSI 6 LED	20-8	300V/10A	8mm (.315")	**10113.0**
15-30VDC/30-60VAC LED	WSI 6 LED	20-8	300V/10A	8mm (.315")	**10122.0**
40-60VDC/80-120VAC LED	WSI 6 LED	20-8	300V/10A	8mm (.315")	**10123.0**
110VDC/220VAC LED	WSI 6 LED	20-8	300V/10A	8mm (.315")	**10124.0**
for 1/4 inch fuses					
no LED indicator	WSI 6/2	20-8	600V/16A	12mm (.472")	**10140.0**
12VDC/10-28VAC LED	WSI 6/2 LED	20-8	600V/16A	12mm (.472")	**10141.0**
15-30VDC/30-60VAC LED	WSI 6/2 LED	20-8	600V/16A	12mm (.472")	**10142.0**
40-60VDC/80-120VAC LED	WSI 6/2 LED	20-8	600V/16A	12mm (.472")	**10143.0**
110VDC/220VAC LED	WSI 6/2 LED	20-8	600V/16A	12mm (.472")	**10144.0**
Disconnect Terminal Blocks					
with test sockets					
with knife switch	WTR 2.5	22-12	300V/10A	5mm (.197")	**10112.0**
with diode plug	WTR 2.5 D	22-12	300V/10A	5mm (.197")	**10132.0**
Accessories					
Rail (Steel)	TS35 x 7.5				**3834.0**
End Bracket	EW 35			8mm (.33")	**3835.6**
End plate profile 2.5-10	WAP2.5-10			1.5 (.06")	**10500.0**
End plate profile 16-35	WAP16-35			1.5 (.06")	**10501.0**
Combination end plate					
and end bracket					
profile 2.5-10	WEW 2			8mm (.315")	**10612.0**
profile 16-35	WEW 1			12mm (.472")	**10590.0**
Jumper Assemblies	Information available on request				
Test plugs and adaptors	Information available on request				
Dekafix marking tags	Information available on request				

Weidmüller

ELECTRONIC INTERFACE MODULES

TRANSITION MODULES



Weidmuller's RD and RI interface modules let you connect discrete wires to cables terminated with D-Sub or IDC connectors. All types may be mounted on 32mm or 35mm DIN rail. A high current version (5 amps per line) of the D-sub interface is available.

Other transition modules are available for use with DIP, card edge, and DIN connectors. Modules are also available with components mounted in each circuit.

RIBBON CABLE INTERFACES

Height: 70mm (2.77″)
Width: 70mm (2.77″)
Wire size: 22-12 AWG
Ratings: 150V/1A per pole

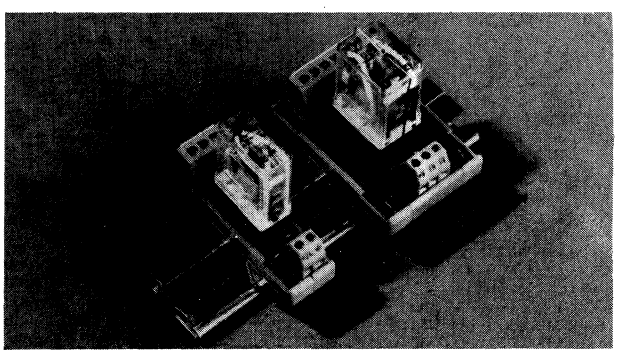
Poles	Type	Length	Cat. No.
10	RI 10 A	44mm (1.57″)	91489.0
14	RI 14 A	50mm (1.97″)	91489.1
16	RI 16 A	56mm (2.20″)	91489.2
20	RI 20 A	65mm (2.55″)	91489.3
26	RI 26 A	85mm (3.35″)	91489.4
30	RI 30 A	95mm (3.73″)	91489.5
34	RI 34 A	106mm (4.14″)	91489.6
40	RI 40 A	120mm (4.73″)	91489.7
50	RI 50 A	150mm (5.92″)	91489.8
60	RI 60 A	175mm (6.89″)	91489.9
64	RI 64 A	182mm (7.15″)	91490.0

D SUBMINIATURE CONNECTOR INTERFACES

Also available in high current versions. Connectors have provisions for jack screws.
Height: 70mm (2.77″)
Width: 70mm (2.77″)
Wire size: 22-12 AWG
Ratings: 150V/1A per pole

Poles	Type	Length	Catalog Numbers	
			Connector half on module contains...	
			Pins	Sockets
9	RD 9A	44mm (1.57″)	91063.8	91064.1
15	RD 15A	56mm (2.20″)	91064.4	91239.3
25	RD 25A	85mm (3.35″)	91064.8	91064.5
37	RD 37A	115mm (4.53″)	91064.2	91064.0
50	RD 50A	150mm (5.92″)	91188.4	91188.6

RELAY SOCKET MODULES



Weidmuller's relay socket modules offer compact, convenient mounting along with plug-in sockets to keep costs low when replacing relays. Modules are available to fit a wide variety of relays, including many not shown here.

For low level switching, TTL logic control is available for the Idec/ Eagle Signal modules (DC types up to 110 volts).

Weidmuller also offers a wide range of optocoupler socket modules for solid state switching.

Other interface modules include line and fuse indicators, surge suppressors, analog converters, and resistor/capacitor networks. Call today for information.

RELAY SOCKET ASSEMBLIES

Wire size: 22-12 AWG
Contact Voltage: 250 Volts

Compatible with listed relays	Type	Contacts	Catalog numbers	
			Diode in parallel w/ coil	without diode
P&B KH; Idec RY4 Aromat HC4	RS-14A	4PDT	91009.3	91009.9
Octal*	RS-21A	DPDT	91000.3	91035.9
P&B KH; Midtex 156 Aromat HC2	RS-3A	DPDT	91010.1	91035.8
P&B R10 Aromat K2	RS-6A	DPDT	91010.7	91010.8
P&B R10 Aromat K2	RS-18A	4PDT	91052.2	91052.3
11 pin round	RS-23A	3PDT	91356.0	91356.1
P&B KU; Aromat HP Idec RR 1.2 & 3B	RS-KU2	3PDT	91051.9	91052.1

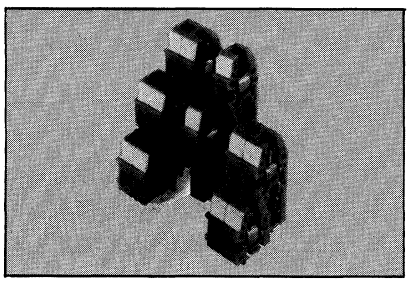
*Other types available for octal timer relays.

Idec RH1B SPDT
Eagle Signal 1601C

Contacts Form C	Catalog numbers		
Height (w/relay): 77mm (3.0″) Width: 70m (2.75″)	Single Channel	Four Channel	Eight Channel
Length: mm in	20mm 0.78″	75mm 2.95″	166mm 6.12″
6 VDC	91051.6	91053.0	91053.5
12 VDC	91052.5	91053.2	91054.6
24 VDC	91044.3	91044.4	91044.5
with Relay	91040.8	91058.9	91055.3
48 VDC	91052.6	91053.3	91055.0
110 VDC	91052.9	91053.4	91055.2
6 VAC	91045.8	91050.5	91050.9
12 VAC	91045.9	91050.6	91051.0
24 VAC	91050.3	91050.7	91051.4
115 VAC	91045.5	91045.6	91045.7
with Relay	91048.1	91059.7	91055.5
240 VDC	91050.4	91050.8	91051.5

Weidmüller

TERMINAL BLOCKS FOR PRINTED CIRCUIT BOARDS

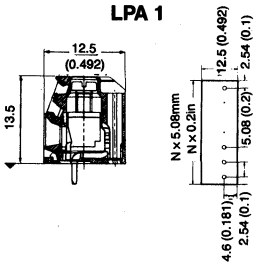


Weidmuller's high density terminal blocks for printed circuit boards use the same proven technology as its DIN-rail terminal blocks. Products come in single-, double-, and triple-level versions; 90°, 45°, and 180° orientations; 5.08mm (.2 inches), 7.62mm (.3 inches), and 5mm centers; standard and TOP (wire and screw co-planar) wire entry; and almost any number of poles. In short, Weidmuller has a block for any PC board application.

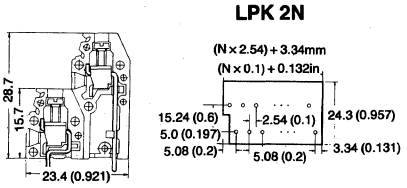
The LP Series features Weidmuller's vibration-proof clamp, easy-to-use Dekafix marking, closed-bottom construction for trouble-free soldering, and accessories (not shown) including fuseholders and disconnects.

Many other blocks are available in addition to the ones listed here. Call for details.

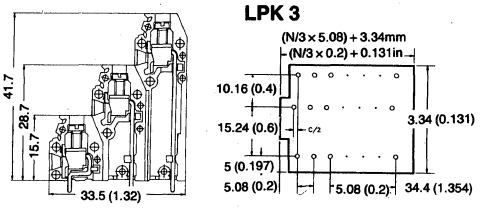
LPA 1



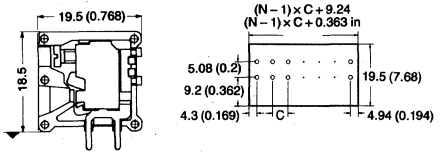
LPK 2N



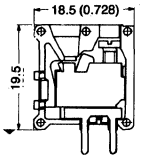
LPK 3



TOP 1.5 90°



TOP 1.5 180°



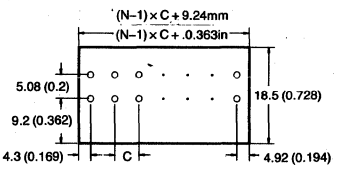
90° Blocks

TECHNICAL DATA

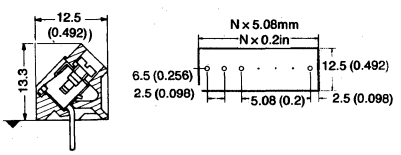
Ratings (UL/CSA)	300V/10A
Wire size AWG	26-14
Pin length	4.5mm (.177")
Mounting hole diameter	1.3 + 0.1mm (.051")
Center-to-center spacing	5.08mm (.2in)

LPA		LPK 2N		LPK 3	
Positions	Cat. No.	Positions	Cat. No.	Positions	Cat. No.
2	14010.6	4	14501.6	6	14585.6
3	14041.6	6	14502.6	9	14586.5
4	91503.4	8	14503.6	12	14587.6
5	91503.5	10	13798.6	15	13802.6
6	91503.6	12	14504.6	18	14588.6
7	91503.7	14	14505.6	21	14589.6
8	91503.8	16	14506.6	24	14590.6
9	91503.9	18	14507.6	27	14591.6
10	91504.0	20	13800.6	30	13804.6
11	91504.1	22	14508.6	33	14592.6
12	91504.2	24	14509.6	36	14593.6
13	91504.3	26	14510.6	39	14594.6
14	91504.4	28	14511.6	42	14595.6
15	91504.5	30	14512.6	45	14596.6
16	91504.6	32	14513.6	48	14597.6

	MAXIMUM LENGTH AVAILABLE
LPA	Assembled on request
LPK 2N	48 positions
LPK 3	72 positions



MK 8



	MK 8 45° Blocks		TOP 1.5 GS Blocks with TOP Clamping System			
Technical Data	UL		UL			
Ratings (industrial)	150/15A		300/10A			
Wire size AWG	22-14		22-14			
Pin length	5mm (.197")		4.5mm (.177")			
Mounting hole diameter	1.3 + 0.1mm (.051")		1.3 + 0.1mm (.051")			
Center-to-center spacing	5mm (.197")		5.08mm (0.2in)			
			90 degrees		180 degrees	
	Type	Cat. No.	Type	Cat. No.	Type	Cat. No.
Components						
Single-pole module			TOP 1.5 GS/1	6442.6	TOP 1.5 GS/1	6440.6
End plate/Spacer			AP/ZP	5697.7	AP/ZP	5697.7
Complete PCB Terminal Blocks						
2 poles	MK 8/2	3320.6	TOP 1.5 GS/2	6419.6	TOP 1.5 GS/2	5699.6
3 poles	MK 8/3	3078.6	TOP 1.5 GS/3	6420.6	TOP 1.5 GS/3	5701.6
4 poles	MK 8/4	3077.6	TOP 1.5 GS/4	6421.6	TOP 1.5 GS/4	5703.6
10 poles	MK 8/10	3026.6				

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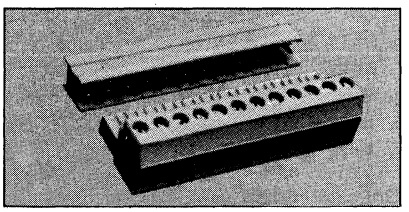
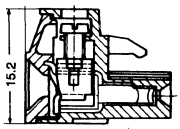
PRINTED CIRCUIT BOARD CONNECTORS

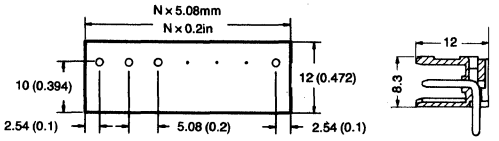
Weidmuller's PC board connectors use our proven screw clamp system to speed installation time and save space. And they add the quick-disconnect feature of a two-piece connector so you can easily change circuit boards and minimize maintenance time.



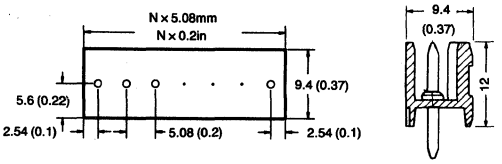
BLA



SLA 90



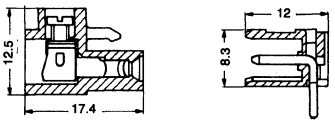
SLA 180



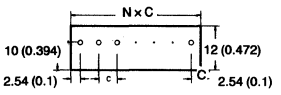
BLA/SLA SYSTEM

Weidmuller's BLA/SLA system uses our vibration-proof clamp, and features an innovative coding system that prevents mismating without loss of circuits. BLA/SLA connectors are made from a UL 94 V-O rated glass-filed polyester that maintains tight tolerances even in harsh, high-heat, high-humidity conditions.

BL



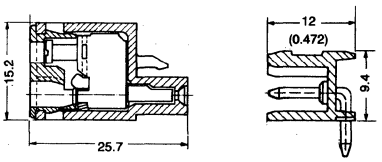
SL 90



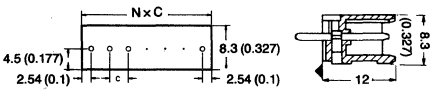
BL/SL System

Weidmuller's popular BL/SL system is available in both 5.08mm (.2 inch) and 5mm center-to-center versions. The BL TOP plug lets you access both the screw and the wire from the same side.

BL TOD



SL 180



BLA/SLA CONNECTORS

Technical Data

Ratings (UL/CSA)	300V/10A
Wire size AWG for BLA	26-14
Pin length for SLA	4.5mm
Mounting hole diameter	1.3 + 0.1mm (.051")
Center-to-center spacing	5.08mm (0.2in)

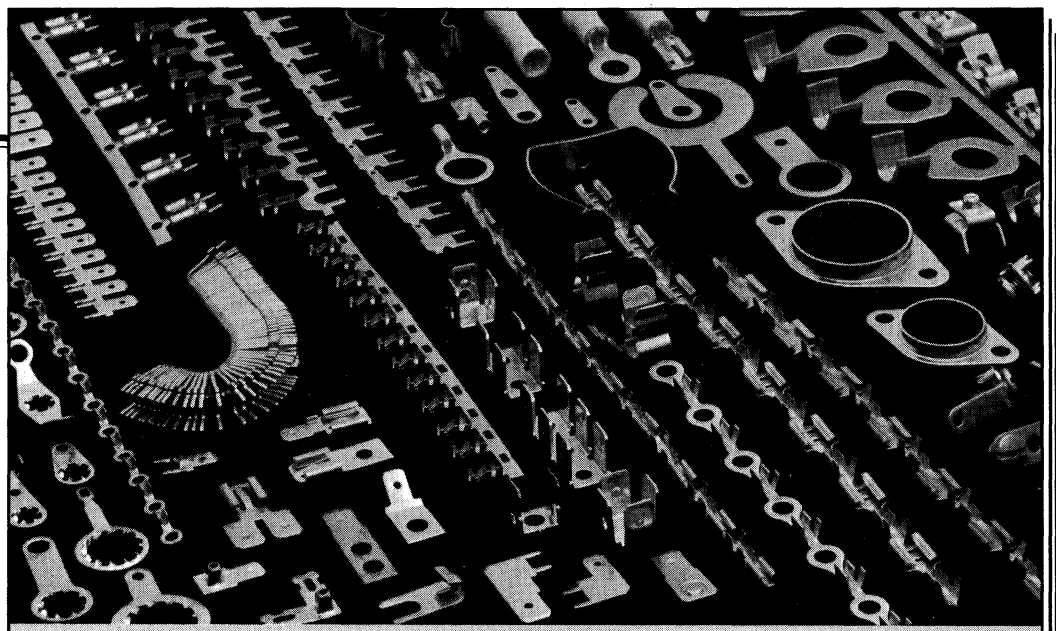
BL/SL CONNECTORS

Technical Data

Ratings (UL/CSA)	300V/10A
Wire size AWG for BLA	26-14
Pin length for SLA	4.5mm
Mounting hole diameter	1.3 + 0.1mm (.051")
Center-to-center spacing	5.08mm (0.2in)

Positions	Standard Entry	Locking Tabs	Top Entry	90 degree header		180 degree header	
				Open Ends	Closed Ends	Open Ends	Closed Ends
BLA Plug				SLA		SLA	
2	12817.6	13560.6		13468.6	13514.6	13491.6	13537.6
3	12818.6	13561.6		13469.6	13515.6	13492.6	13538.6
4	12819.6	13562.6		13470.6	13516.6	13493.6	13539.6
5	12820.6	13563.6		13471.6	13517.6	13494.6	13540.6
6	12821.6	13564.6		13472.6	13518.6	13495.6	13541.6
7	12822.6	13565.6		13473.6	13519.6	13496.6	13542.6
8	12823.6	13566.6		13474.6	13520.6	13497.6	13543.6
9	12824.6	13567.6		13475.6	13521.6	13498.6	13544.6
10	12825.6	13568.6		13476.6	13522.6	13499.6	13545.6
11	12826.6	13569.6		13477.6	13523.6	13500.6	13546.6
12	12827.6	13570.6		13478.6	13524.6	13501.6	13547.6
Available to 24 positions							
BL Plug				SL		SL	
2	12591.6		13358.6	1126.6		1113.6	
3	12592.6		13559.6	1125.6		1112.6	
4	12593.6		13360.6	1124.6	12349.6	1111.6	12363.6
5	12594.6		13361.6	1123.6	12350.6	1110.6	12364.6
6	12595.6		13362.6	1122.6	12351.6	1109.6	12365.6
7	12596.6		13363.6	1121.6	12352.6	1108.6	12366.6
8	12597.6		13364.6	1120.6	12353.6	1107.6	12367.6
9	12598.6		13365.6	1119.6	12354.6	1106.6	12368.6
10	12599.6		13366.6	1118.6	12355.6	1105.6	12369.6
11	12600.6		13367.6	1117.6	12356.6	1104.6	12370.6
12	12601.6		13368.6	1116.6	12357.6	1103.6	12371.6
Available to 15 positions (BL TOP to 12 positions)							

821 SOUTHLAKE BLVD. • RICHMOND, VIRGINIA 23236 • TEL: 804-794-2877 • TELEX: 82-8376 • FAX: 804-794-0252



ZIERICK

PRECISION METAL PARTS FOR THE E/E INDUSTRY

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MINIGLOSSARIES
FORMULAS • CHARTS
PRODUCT SELECTION GUIDES
FORMS
CODES TECHNICAL INFORMATION

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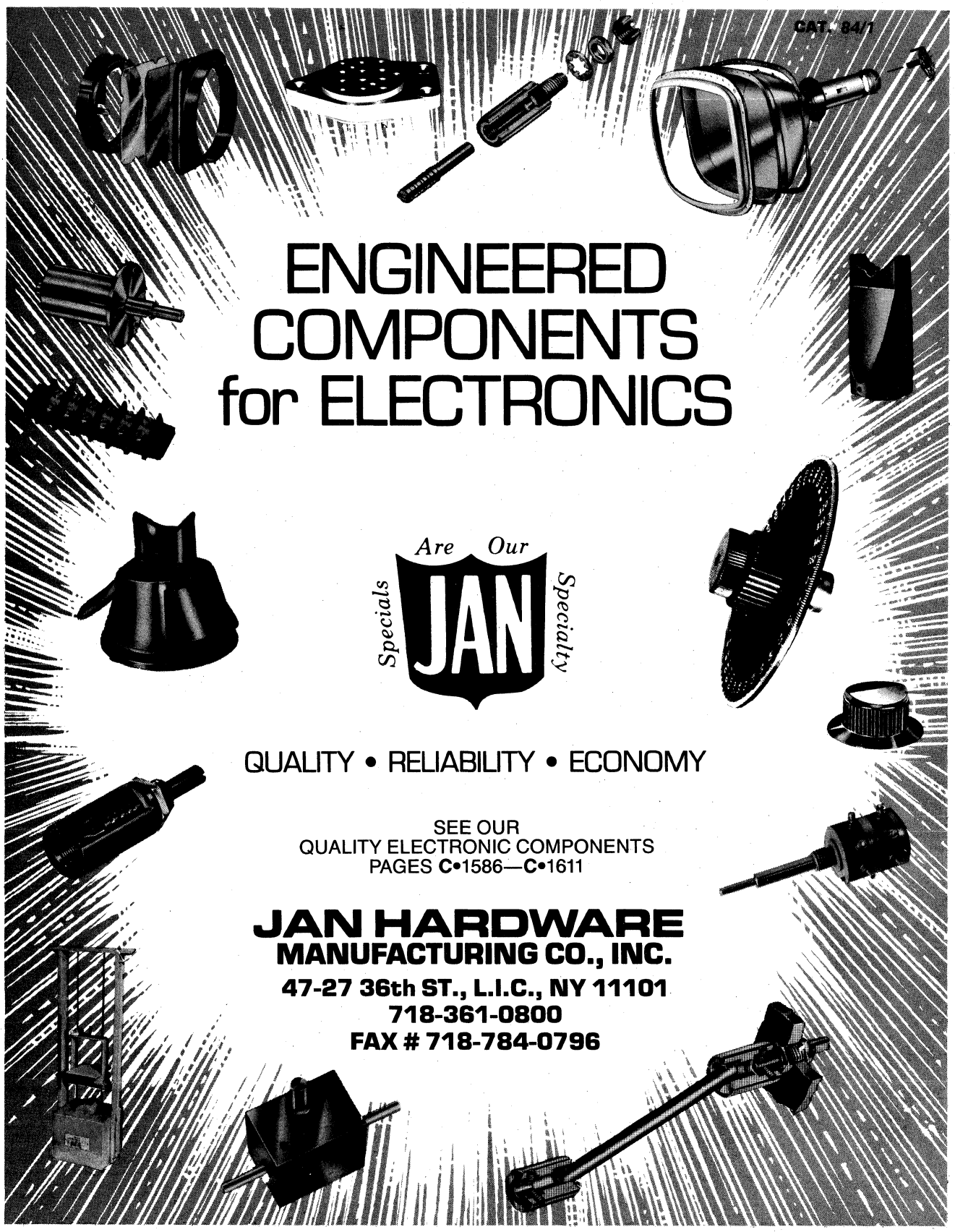
CAT. 84/1
ENGINEERED
COMPONENTS
for ELECTRONICS
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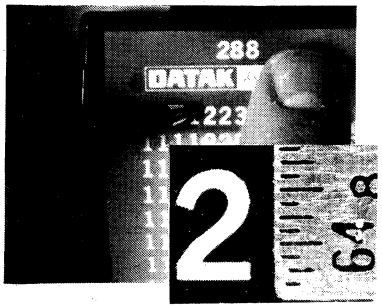
Specials
JAN
Specialty
QUALITY • RELIABILITY • ECONOMY
SEE OUR
QUALITY ELECTRONIC COMPONENTS
PAGES C•1586—C•1611
JAN HARDWARE
MANUFACTURING CO., INC.
47-27 36th ST., L.I.C., NY 11101
718-361-0800
FAX # 718-784-0796

PANEL HARDWARE

Manufacturer	Starting EEM Page No.	Bezels	Dials, Instrument	Pointers, Dial	Handles	Knobs	Knob Types				Panel Markings	Plates, Estucheon	Drives & Drive Mechanisms	Shaft Couplings	Shaft Locks	Speed Reducers
							Control-Shaft Locking	Limit Stop	Slip Clutch	Ratio Drive Torque						
Datak	C•1584										√					
Elma Electronics	C•1585	√	√	√	√	√	√				√	√	√			
Jan Hardware	C•1586	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
JMJ Technical Prod. Inc.	C•1612	√														
RMF Products Inc.	C•1613	√														
Selco Products	C•1614		√	√		√										

DATAK dry TRANSFERS and COATINGS

THE DATAK CORPORATION 3117M Paterson Plank Road, North Bergen, NJ 07047 (201) 863-7667



HOW THEY WORK . . . These amazing letters, words and art patterns transfer to any clean surface. Just rub down with a ballpoint pen! Heat-resistant adhesive is safe for diazo copies.

MASTER ART QUALITY . . . Razor sharp edge definition makes DATAK transfers superb for original artwork or prototypes.

TAILOR-MADE COATINGS . . . Any old protective spray won't work over dry transfers. Our formulas flow evenly over the transfer and protect it perfectly on all classes of surfaces: glass, paper, wood, metal, plastics or paint.

TITLES and COMPONENT DESIGNATION SETS for ELECTRONIC EQUIPMENT

Newest **professional titles** have thousands of ⅛"(12 pt.) and 0.105"(10 pt.) words for both standard and micro-sized equipment control panels. Sets have 24 sheets, 3½" x 5". 12 point sets use bold face type, have one letter and one number sheet; 10 point sets are bold face titles and include 4 each, light and bold number and letter sheets. Letter and number sets have 12 indentical sheets.

Component designation sets (TERMINAL and CHASSIS MARKING sets) include 24 sheets, 3½" x 5" of sequential numbers, letters and letter combinations conforming to ANSI Y32.16 and IEEE STD 200. This series is ⅛" size only. See JotDraft #JD192-JD251 for .085" through .250" designation numbers. Coat transfers for protection. See coatings section.

948 Black (949 White) 10 pt. Titles	**$12.50**
950 Black (951 White) 10 pt. Bold Letters	**7.95**
952 Black (953 White) 10 pt. Bold Numbers	**7.95**
954 Black (955 White) 10 pt Lt. Face Letters	**7.95**
956 Black (957 White) 10 pt. Lt. Face Numbers	**7.95**
9581 Black (9591 White) 12 pt. Titles	**12.95**
9601 Black (9611 White) 12 pt. Bold Letters	**7.95**
9621 Black (9631 White) 12 pt. Bold Numbers	**7.95**
9661 Black (9671 White) Terminal & Chassis set	**12.95**

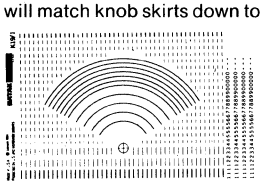
DATAMARK™ TITLES, PATTERNS, ALPHABETS and NUMBERS

These are smaller assortments for specialized electronic applications. Type matches professional 9581-9671 series. Switch patterns match some that are in #968 Meter Dial and Switch Marking set. All sets contain six 3½" x 5" sheets. Coat transfers for protection. See coatings section.

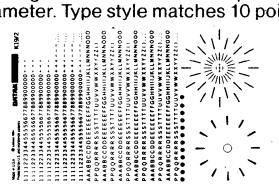
K58B Black (K58W White) Audio, TV, Hi-Fi	**$4.30**
K59B Black (K59W White) Amateur Radio, CB	**4.30**
K60B Black (K60W White) Experimenter, Home, Intercom	**4.30**
K61B Black (K61W White) Test Equipment, Industry	**4.30**
K62 Marks and Switch Patterns, black, white asst.	**$4.30**
K63 ⅛" Letters and Numbers, black, white, gold, asst.	**4.30**
K64 ¼" Letters and Numbers, black, white, gold, asst.	**4.30**
K65 ½" Letters and Numbers, black, white, gold, asst.	**4.30**

METER DIAL and SWITCH MARKING SET

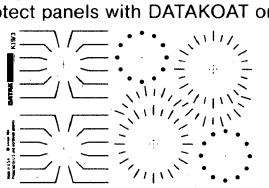
Crisp meter graduations let you modify dial scales fast. Saves time and money compared to a "mod center" job. Tap switch marks are preset to 7.5° and 15° detents but will transfer to any angle. The smallest switch pattern will match knob skirts down to 0.5" diameter. Type style matches 10 point professional title and letter sets described above. Complete set includes 12 sheets, 5"x 7" in black, white and red. Refill sheets available separately in uncut sets of 4 identical sheets. *K19/1 available in white as a refill only. Protect panels with DATAKOAT or HARDKOAT. Do not coat dialplates.



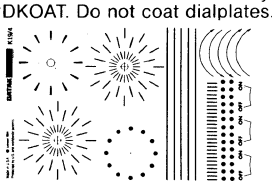
K19/1 BLK
K19/5 RED
K19/1* WHT



K19/2 BLK
K19/6 RED
K19/9 WHT



K19/3 BLK
K19/7 WHT
K19/12 RED



K19/4 BLK
K19/8, 10 WHT
K19/11 RED

968 Meter Dial and Switch Set **$12.95**

K19/(Specify #) Refill of 4 identical sheets **$7.00**

DATAKOAT™ PROTECTIVE COATINGS

DATAKOAT is a 100% acrylic high-solids water-clear coating for metals and plastics. It encapsulates dry transfers in a tough film. Its solvents will not attack most plastics, lacquers or cured enamels. The dry film has a high dielectric strength, is very flexible, moderately hard and extremely resistant to weathering and UV exposure. DATAKOAT is not recommended for transfers on paper.

04176 DATAKOAT Brushcoat and Thinner Kit (1 oz. ea.)	**$3.65**
04177 DATAKOAT Gloss Spray (12 oz. net wt.)	**5.75**
04178 DATAKOAT Matte Spray (12 oz. net wt.)	**5.75**

HARDKOAT™ PROTECTIVE COATINGS

HARDKOAT is a clear, very high-solids quality cellulosic resin for paper, wood and other porous surfaces. Its solvents fuse the dry transfer into the surface while its resins bond to the surface with an extremely hard, flexible film. HARDKOAT may be used on metals and many painted surfaces where it gives superior protection against abrasion and scratching. Its solvents temporarily soften many plastic materials, so it should be used with caution. Multiple heavy coats may have a very faint yellowish tint. Use DATAKOAT if an absolutely water-clear coating is essential.

04170 HARDKOAT Gloss Spray (12 oz. net wt.)	**$5.75**
04171 HARDKOAT Matte Spray (12 oz. net wt.)	**5.75**

SEE SECTION 4200 FOR DATAK PRINTED CIRCUIT KITS AND WIRE MARKERS

ELMA Electronic Inc.

25 JAHRE ANNEE YEARS ELMA Electronic

Collet Safety Knobs and Front Panel Hardware

A Member Of The Sulzer Group, 41440 Christy Street, Fremont, CA 94538 • (415) 656-3400

All ELMA products are available off-the-shelf and REASONABLY PRICED

Modular Design

The modular design and the wide assortment of **ELMA** collet safety knobs offer countless possible combinations. The standard and wing knobs are of contemporary design, available in 7 sizes and various colors. A broad selection of accessory components is also available, including knobs, caps and pointers in no less than 7 colors, various printed dials, stators, sockets and nut covers are available in gloss or matte finish.

Material

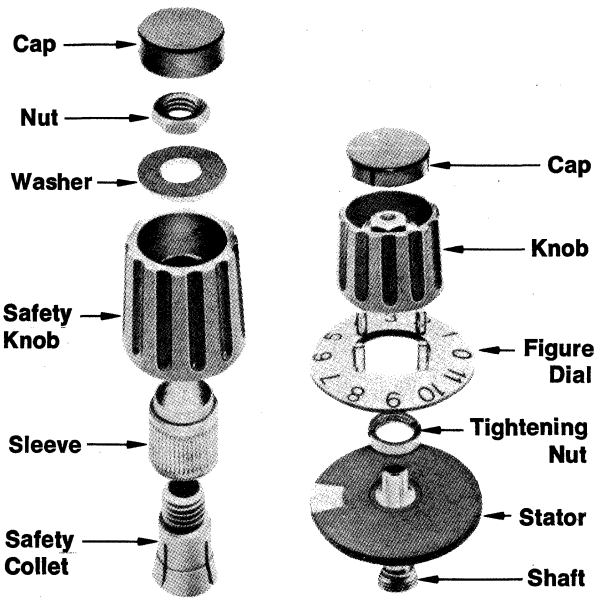
With the exception of the transparent figure dials all of the **ELMA** collet safety knobs and accessories are made of Polyamide.

Safety

With the knob installed and the cap in place there is no possibility of shock hazard as there are no exposed metal parts, thus satisfying both O.S.H.A. and U.L. requirements.

Colors

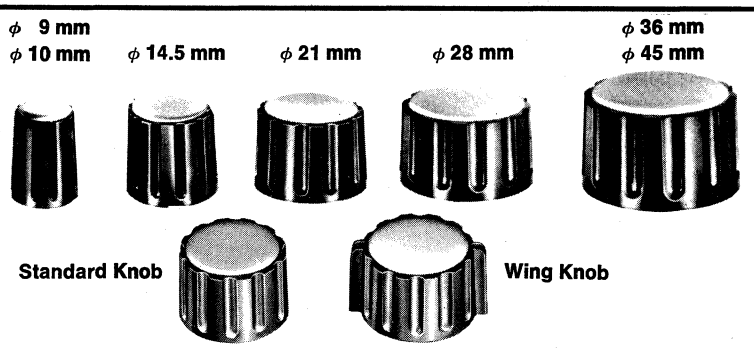
ELMA collet safety knobs offer a very wide choice of standard colors and color combinations in both glossy and matte finish. Collet knobs are available in light gray, black and red. Caps and pointers are available in light gray, black, red, blue, yellow, and green. In addition **ELMA** offers custom colors to meet your exacting requirements.



Collet Knob Sizes/Designs

ELMA collet safety knobs are available in diameters of 9 mm, 10 mm, 14.5 mm, 21 mm, 28 mm, 36 mm and 45 mm.

Every **ELMA** knob is available from stock in both conventional and wing versions, each with or without setting line.



LED Arrays, Test and Switch Socket Arrays

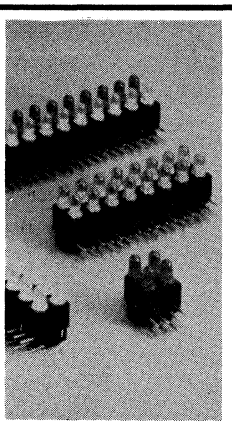
LED: High-quality diode in molded plastic holder, single and double or in blocks of 2, 4, 8, 16 for easy and quick right-angle mounting. Colors: red, green and yellow. Customized color sequence possible. 2mA and 10mA executions.

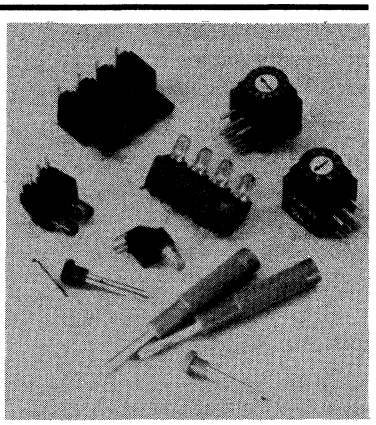
Test & switch sockets: Right-angle mounted sockets in blocks of 1, 2, 4, 8 and 16 elements. Colors: red, green, yellow, black, blue.

Test & shorting plugs: Nickel or gold plated brass pin. Colors: red, green, yellow, blue, black.

Coding switch for front panel: High-quality BCD and hexadecimal coded, shorting or non-shorting, with/without stop, sealed, for right-angle mounting.

All the above products have pins in the 0.1" (5.08 mm) spacing according to DIN 41494.





For complete information write or call for our catalog today!

See section 1400 (Cabinets, Enclosures, Racks & Chassis), section 2025 (Computers-Mini/Micro) and section 5100 (Switches) for additional ELMA products!

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

FOREWORD

This catalog contains information which enables design engineers to incorporate our mechanical, electro-mechanical components and related products into equipment without the need for additional detail drawings.

Jan Hardware Mfg. Co., has been a major supplier to the electronics, aerospace and related industries for more than 30 years. Our key personnel have had extensive experience in the design, fabrication and manufacture of components, systems, and all related equipment.

JAN's personnel are committed to serve you with service and products which meet the highest standards of quality, reliability and economy. We look forward to adding your name to our list of satisfied customers.

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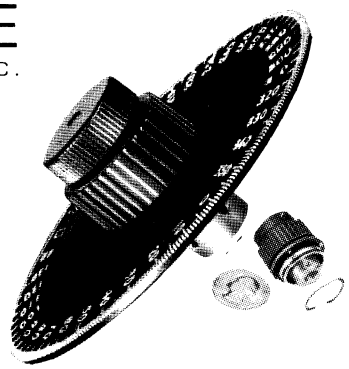
Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

MACROVERNIER—REDUCTION DRIVE PRECISION TUNING BUILT INTO KNOB

- **Integral assembly**
- **Zero Backlash**
- **Infinite resolution with absolute shaft registration**
- **Driving torque-10 oz./in.**
- **Saves space behind the panel**
- **Installation in seconds, without special tools**
- **Knobs and Component Shaft rotate in same direction**



Series 1500: (10:1)
Series 1700: (40:1, 100:1)
Others available

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"B" = 1:1 Direct Drive

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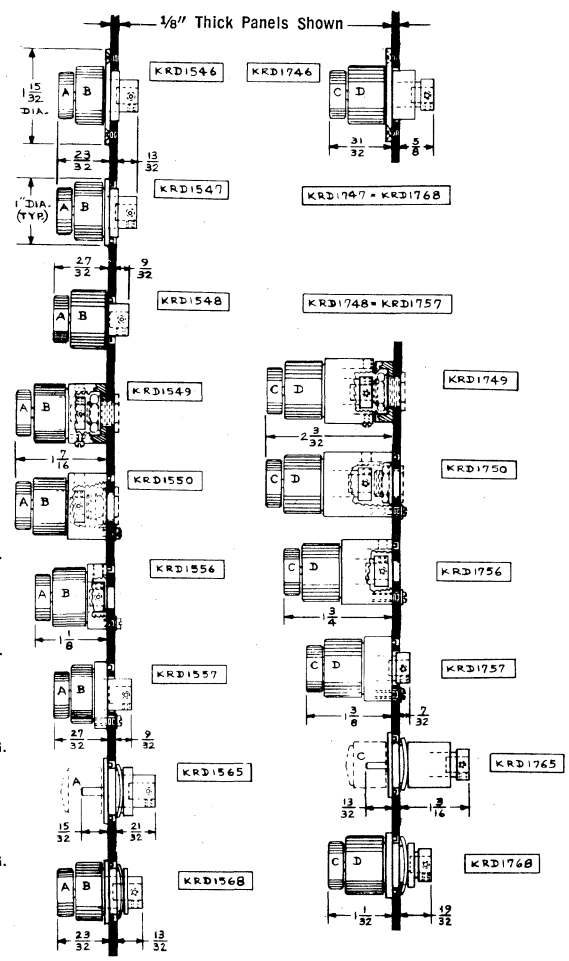
"D" = Min. Ratio 10:1 4:1



FRONT FLANGE — Panel Mounted. 2 Screws.

2 PINS ONLY Component Mounted.

PANEL BUSHING — Separate Spacer. Secured by bushing. Panel Mounted.

PANEL BUSHING — Integral Spacer.
-7 2 Pins Only. Component Mounted.
-8 2 Screws Only. Panel Mounted.

SCREWS AND/OR PINS THRU PANEL.
-7 2 Pins Only. Component Mounted.
-8 2 Screws Thru Panel.

SCREWS AND/OR PINS THRU PANEL.
-7 2 Pins Only. Component Mounted.
-8 2 Screws Thru Panel.

2 PINS AND BOWED RETAINING RING.
Panel Mounted.
Single Knob — Max. Ratio Only.
(Various Size Knobs Available.)

2 PINS AND BOWED RETAINING RING.
Panel Mounted.

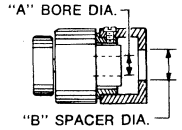
PANEL "HOLES" REQUIRED

KRD Number	Min. Dia. Thru Panel	2 Holes @ 180°	
		Dia.	B.C. Dia.
1546 1746	.790	4-40 TAP	1.188±.001
1550-8 1750-8	NOTE No. 1	.125	.851±.001
1556-8 1756-8	NOTE No. 2	.125	.851±.001
1557-8 1757-8	.562	.125	.851±.001
1549 1749	REQUIRES ONLY NOTE No. 1		

KRD Number	Min. Dia. Thru Panel	2 Slots @ 180° .078 +.002 −.000 Wide
		Dimen. Across Outside of Slots
1547	.790	.995 +.003 −.000
1548	.530	.750 +.003 −.000
1550-7 1750-7	NOTE No. 1	.945 ±.005
1556-7 1756-7	NOTE No. 2	.945±.005
1557-7 1757-7	.562	.945±.005
1565 1765	.790	.995 +.003 −.000
1568 1768	.790	.995 +.003 −.000

NOTES:
1. Clearance hole for 1/4" or 3/8" panel bushing.
2. Clearance hole for component shaft only.

COMPLETE PART NUMBERS

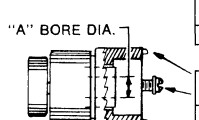


"A"

"A" +.002 −.000 Bore Dia.	First Dash No.
.127	-2
.190	-3
.252	-4

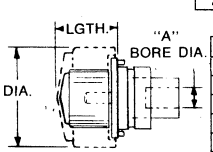
"B"

"B" Dia. Thru Spacer	Second Dash No.
.252 +.002 −.000	-4
1/4-32 THD.	-4T
.377 +.002 −.000	-6
3/8-32 THD.	-6T



"C"

Pins or Screws (180° Apart)	Second Dash No.
2 Pins Only	-7
2 Screws Only	-8



"D"

Knobs Dia.	Lgth.	Second Dash No.
23/32	25/32	-07
15/16	29/32	-09
19/32	13/16	-12
1 25/32	31/32	-17

LOW RATIO SINGLE UNITS
(10/1 Ratio Only)
KRD 1546-"A"
KRD 1547-"A"
KRD 1548-"A"
KRD 1549-"A"-"B"
KRD 1550-"A"-"C"
KRD1556 "A"-"C"
KRD1557 "A"-"C"
KRD1565 "A"-"D"
KRD1568 "A"

HIGH RATIO DOUBLE UNITS
Ratios (100/10) or (40/4)
KRD1746-"A"—
KRD1749-"A"-"B"
KRD1750-"A"-"C"
KRD1756-"A"-"C"
KRD1757-"A"-"C"
KRD1765-"A"-"D"
KRD1768-"A"

TYPICAL PART NUMBERS:
*KRD1550-4-8 *KRD1749-3-6-100/10

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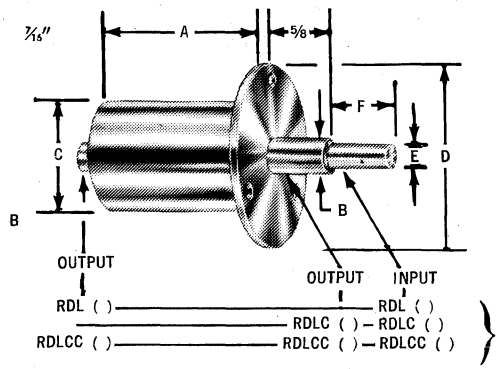
Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

REDUCTION DRIVES—BALL BEARING TYPE

For Fine Instrument and Machine Control



Cat. No.	Ratio	A	B O.D.	B I.D.	C	D	Input Shaft E	F	Bolt-Mtg. Dia
RDL-1	2.6:1	1	3/8	1/4	1 1/8	1 13/16	1/4	3/4	1 15/32
RDL-2	7.0:1	1 13/32	3/8	1/4	1 1/8	1 13/16	1/4	3/4	1 15/32
RDL-3	17.0:1	1 13/16	3/8	1/4	1 1/8	1 13/16	1/4	3/4	1 15/32
RDLC-1	2.6:1	1	3/8	1/4	1 1/8	1 13/16	1/4	1 1/2	1 15/32
RDLC-2	7.0:1	1 13/32	3/8	1/4	1 1/8	1 13/16	1/4	1 5/64	1 15/32
RDLC-3	17.0:1	1 13/16	3/8	1/4	1 1/8	1 13/16	1/4	23/32	1 15/32
RDLCC-1	2.6:1	1 13/32	3/8	1/4	1 1/8	1 13/16	1/4	1 5/64	1 15/32
RDLCC-3	17.0:1	2 43/64	3/8	1/4	1 1/8	1 13/16	1/4	11/16	1 15/32
RDL-4	45.0:1	2 7/32	3/8	1/4	1 1/8	1 13/16	1/4	23/32	1 15/32
RDL-5	120.0:1	2 23/32	3/8	1/4	1 1/8	1 13/16	1/4	1 5/64	1 15/32
RDL-6	300.0:1	3 7/32	3/8	1/4	1 1/8	1 13/16	1/4	1 1/16	1 15/32

All Ratios are ± 10%.

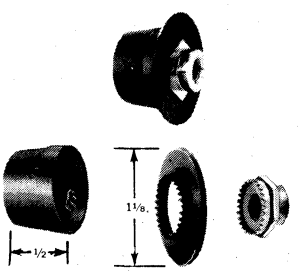
Employs precision ball bearings. For rotary control of components. Smooth motion. Ruggedly built, permanently sealed and lubricated.

Input and output shafts operate in SAME DIRECTION. Type "RDL" provides "in-line" intput-output shafts. Type "RDLC" is supplied with concentric shafts whereby the output envelopes the input shaft. An added feature of Type "RDLCC" is the output shaft in the rear.

KNOB RATIO DRIVE

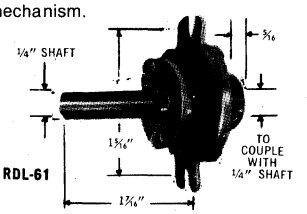
Cat. No. KRD-11 (Plain Gripping Surface)
Cat. No. KRD-12 (Knurled Gripping Surface)
Other ratios designed to specifications. Engineered miniature gear system, permits precise, fine tuning of controls.*
Brass gears: black anodized aluminum knob and dial. Available with knurled or non-knurled outside knob. Available for 1/8" shafts. 1/4" on special order.

*9 to 1 ratio (to dial skirt).
1:1 to potentiometer or control.

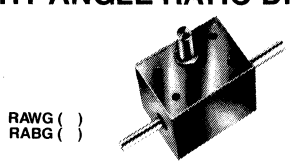


IN-LINE RATIO DRIVE—6.3:1

For smooth rotary control of components requiring Vernier adjustments. Suitable for use where panel space is at a premium. Durable, ruggedized ball bearing mechanism.

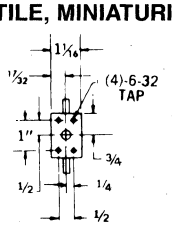


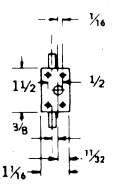
RIGHT ANGLE RATIO DRIVES—VERSATILE, MINIATURIZED, RIGHT ANGLE ROTARY CONTROLS

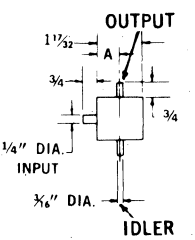


Dual output stainless steel shafts at right angles to input, provide ideal type instrument control. With matched bevel, worm gears cover wide range of ratios.

Especially useful for handling spring or gravity-loaded components. Output shaft automatically locks in any desired position yet remains free for smooth adjustment by input shaft. Assembled in dust-proof housings, gears are permanently pinned in place mounted in oilite bearings, and held under constant pressure.







BEVEL GEAR RIGHT ANGLE DRIVES

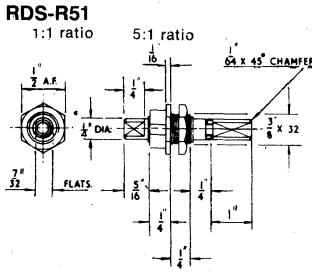
Cat. No.	Ratio	"A"
RABG-1	1:1	7/8
RABG-2	2:1	7/8
RABG-3	3:1	7/8

WORM GEAR RIGHT ANGLE DRIVES

Cat. No.	Ratio	"A"
RAWG-1	5:1	3/4
RAWG-2	10:1	3/4
RAWG-3	20:1	3/4

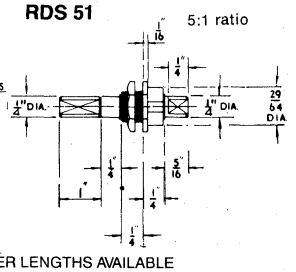
DIRECT DRIVE, REVERSE VERNIER

RDS-R51



CONTINUOUS DRIVE

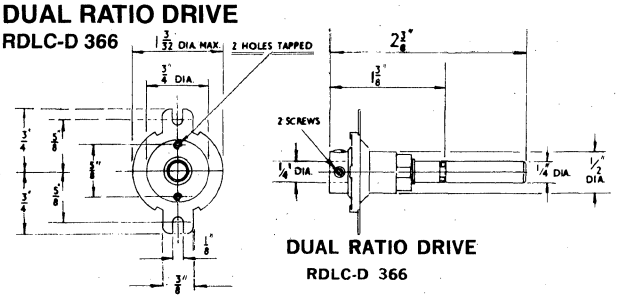
RDS 51



*OTHER LENGTHS AVAILABLE

DUAL RATIO DRIVE

RDLC-D 366



DUAL RATIO DRIVE
RDLC-D 366

Reverse Vernier Action with 36-1 ratio and Fast Drive of 6-1 ratio.
Also available with flange bushing P/N RDLC-D 366-F

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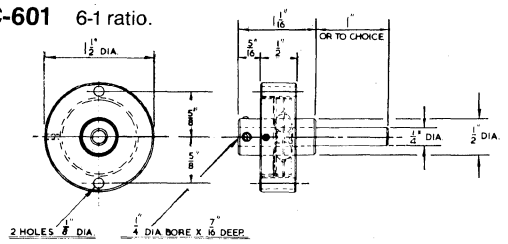
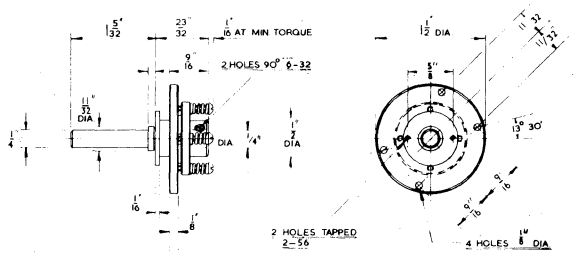
JAN HARDWARE
MANUFACTURING COMPANY INC.

RATIO DRIVES

RDLC-601 6-1 ratio.

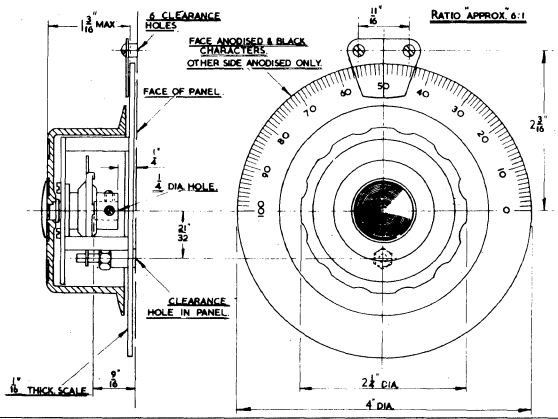


ADJUSTABLE TORQUE BALL DRIVE–RDLA-601 6-1 ratio.

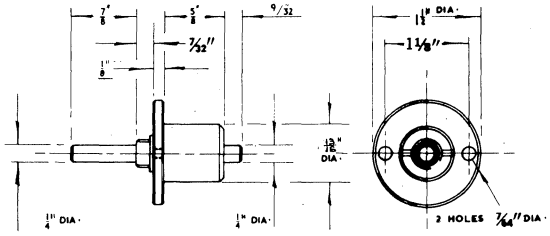


Output torque range 20 to 60 oz./inches (Standard: 25 oz./in.)

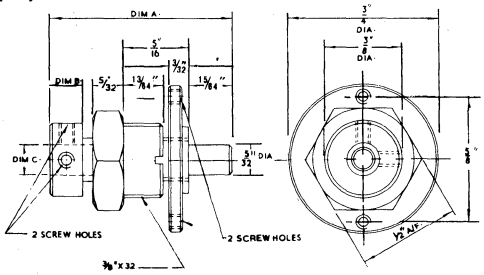
BALL DRIVE DIAL–DAD 600 6-1 ratio.



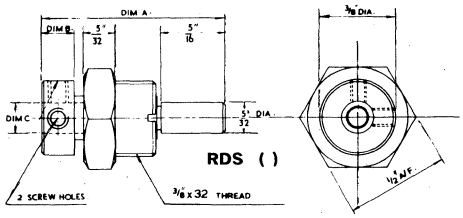
RDL-C 101 10-1 ratio.



RDM ( ) 10-1 ratio.

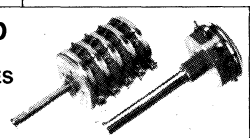


RDS ( ) 10-1 ratio.



PART NO.	PART NO.	DIM A	DIM B	DIM C
RDS 101-1	RDM 101-1	29/32"	5/32"	5/32"
RDS 101-2	RDM 101-2	15/16"	13/64"	15/64"
RDS 101-3	RDM 101-3	15/16"	13/64"	1/4"

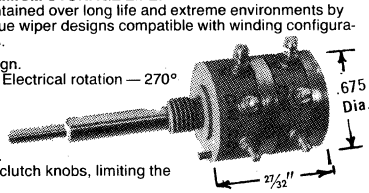
POTENTIOMETERS / PRECISION WIRE WOUND



• LINEAR AND NON-LINEAR • SINGLE AND MULTI-TURN
• PENDULUM OPERATED • SECTORS AND GYRO PICKOFFS • SWITCHES
Reliable, competitively priced wire-wound potentiometers for commercial, industrial and military electronic equipment manufacturers.

- **EXCELLENT LINEARITY:** 0.03% available in single turn 5" diameter unit.
- **LONG LIFE:** Over two million revolutions with base metal windings.
- **WIDE TEMPERATURE RANGE:** Available for operation from −55°C to +125°C.
- **LOW NOISE:** Platinum alloy winding also insures low noise level.
- **RELIABILITY:** Welded taps for better mechanical and electrical connections.
- **HIGH RESOLUTION:** Wire as fine as 0.0003" diameter can be used.
- **CUSTOM DESIGNS:** Fast prototype delivery on special linear or non-linear units.
- **PRECISION CONSTRUCTION:** Anodized aluminum housings and polished steel shafts.
- **ACCURATE FUNCTIONS:** Welded taps to a single turn of wire eliminates shorted sections of winding at intermediate taps.
- **RUGGEDNESS:** Meets all applicable MIL Specs.
- **MAXIMUM STORAGE LIFE:** Maintained over long life and extreme environments by unique wiper designs compatible with winding configurations.

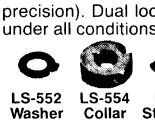
RESISTOR, VARIABLE. Single and Dual gang.
Conforms to MIL-R-12934. Resistance values as required. Linear design.
Power: 1 watt continuously, up to 70°C.; Mechanical rotation — 300°; Electrical rotation — 270°
Noise level less than 1% of total resistance.
Operating torque: 4.0 to 6.0 oz. in., detent where specified.
Detent torque: 5 oz. in. above operating torque, or 6.0 to 14.0 oz. in. including unit operating torque.
Min. rotational life: 25,000 cycles. Operating Temp.: −65°C to 150°C.
Clutch Knobs: It is recommended that potentiometers be adjusted by clutch knobs, limiting the torque exerted on shafts beyond their rotational limits.

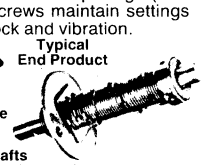


Special designs upon request: winding/single or multi layer
Versatile computerized winding machines will wind to above specifications or your design.

LIMIT STOP COMPONENTS

Limit stop as a component to design with, potentiometers, capacitors, or other similar units. Added washers enables an increase in stop range (with precision). Dual locking screws maintain settings under all conditions of shock and vibration.





Available for 1/4" and 3/16" Shafts
Specify — (3) for 3/16" — (4) for 1/4"
Can be designed internally into JANSET knobs.

MINIATURIZED SLIP CLUTCH

Couples 1/8", 3/16" or 1/4" input-output (2 set screws). Also 'D' shafts (with or without set screws). Torques: 2 to 50 oz./in. All metal components. 5/8" dia. × 5/8" long.
APS-1723
Shaft sizes (—2 = 1/8") (—3 = 3/16") (—4 = 1/4") min. & max. torque in oz./inches
Example: Part #APS-1723-34-8-16
To fit 3/16" dia. shaft to 1/4" dia. shaft, and torque 8 to 16 oz./inches.

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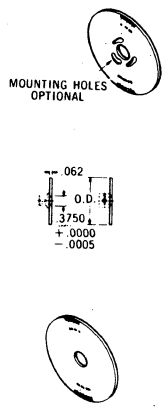
DIALS, DISC Clockwise and Counter Clockwise PRECISION ENGRAVED

Cat. No.	Range	0.+.000 D.−.003	Steps in Degrees	Graduations
DA-01	—		—	BLANK
DA-02	0-360		2°	180
DA-03	0-100		3°-36′	100
DA-04	0-60	1.500	6°	60
DA-05	0-50		7°-12′	50
DA-06	0-25		14°-24′	25
DA-07	0-10		36°	10
DA-08	—		—	BLANK
DA-09	0-360		2°	180
DA-010	0-120		3°	120
DA-011	0-100		3°-36′	100
DA-012	0-72	2.000	5°	72
DA-013	0-60		6°	60
DA-014	0-50		7°-12′	50
DA-015	0-25		14°-24′	25
DA-016	0-10		36°	10
DA-017	—		—	BLANK
DA-018*	0-360		1°	360
DA-019*	0-360		2°	180
DA-020	0-200		1°-48′	200
DA-021	0-180	3.000	2°	180
DA-022	0-120		3°	120
DA-023*	0-100		3°-36′	100
DA-024	0-72		5°	72
DA-025	0-50		7°-12′	50
DA-026	0-10		36°	10
DA-027	—		—	BLANK
DA-028*	0-360		1°	360
DA-029*	0-360		2°	180
DA-030	0-200	4.000	1°-48′	200
DA-031	0-180		2°	180
DA-032	0-100		3°-36′	100
DA-033	0-50		7°-12′	50
DA-034	0-10		36°	10



Material: Aluminum 24ST Black Anodized

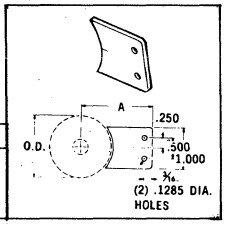
See Pg. C•1591 For Hubs

*Available counter clockwise. To order, use prefix DC in place of DA.

INDEX, DIAL DISC

Material: Aluminum 24ST Black Anodized
Note: Use with "DA" and "DC" Type Disc Dials

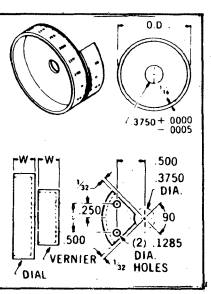
Cat. No.	A	O.D. of Dial
DG-1	1.760	1.500
DG-2	2.010	2.000
DG-3	2.510	3.000
DG-4	3.010	4.000



DIAL, DRUM AND VERNIER SETS

PRECISION ENGRAVED
Material: Aluminum 24ST Black Anodized
Note: Special Sets Available on Request

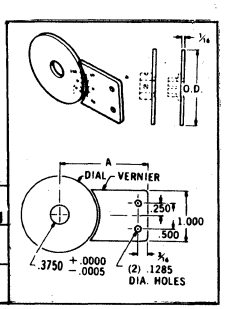
Cat. No.	0.+.005 D.−.005	W	Dial Graduations	Dial Range	Vernier Reading
DJ-1	1.490	.375	360° in 2° Steps	0°-360°	12′
DJ-2	1.990	.375			12′
DJ-3	2.490	.500	360° in 1° Steps		6′
DJ-4	2.990	.500			6′



DIAL, DISC AND VERNIER SETS

PRECISION ENGRAVED
Material: Aluminum 24ST Black Anodized
Note: Special Sets Available on Request
For Additional Information See Technical Section

Cat. No.	0.+.000 D.−.005	A	Dial Graduations	Dial Range	Vernier Reading
DH-1	1.500	1.760	360° in 2° Steps	0°-360°	12′
DH-2	2.000	2.010			12′
DH-3	3.000	2.510	360° in 1° Steps		6′
DH-4	4.000	3.010			6′

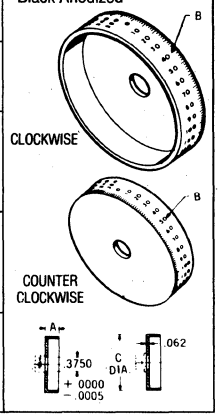


We invite your inquiries for special dials and drums. Also available from stock — precision ground shafts.

DIALS, DRUM Clockwise and Counter Clockwise PRECISION ENGRAVED

Cat. No.	A	B	C	Range	Steps in Degrees
DB-1		—		BLANK	—
DB-2	3/8	100	.990	0-100	3°-36′
DB-3		180		0-360	2°
DB-4		—		BLANK	—
DB-5	3/8	60	1.490	0-60	6°
DB-6		100		0-100	3°-36′
DB-7		180		0-360	2°
DB-8		—		BLANK	—
DB-9		50		0-50	7°-12′
DB-10	3/8	25	1.990	0-25	14′-24°
DB-11		10		0-10	36°
DB-12		180		0-180	2°
DB-13		180		0-360	2°
DB-14		—		BLANK	—
DB-15		200		0-200	1°-48′
DB-16	1/2	180	2.490	0-180	2°
DB-17*		180		0-360	2°
DB-18*		360		0-360	1°
DB-19		100		0-100	3°-36′
DB-20		—		BLANK	—
DB-21		180		0-180	2°
DB-22	1/2	100	2.990	0-100	3°-36′
DB-23		10		0-10	36°
DB-24*		360		0-360	1°
DB-25*		180		0-360	2°

Material: Aluminum 24ST Black Anodized

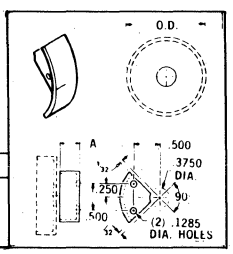


*Available counter clockwise. To order, use prefix DD in place of DB.

INDEX, DRUM DIAL

Material: Aluminum 24ST Black Anodized
Note: Use with "DB" and "DD" Type Disc Dials

Cat. No.	A	O.D. of Drum
DF-1	.375	1.490
DF-2	.375	1.990
DF-3	.500	2.490
DF-4	.500	2.999

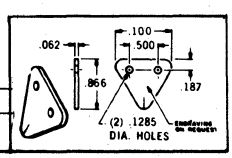


LOCKS, DIAL No. AP-1060

Supplied completely assembled. Securely locks dial in position. Nickel plated on brass. Knurled head. 1 3/8″ overall length.

INDEX, DIAL

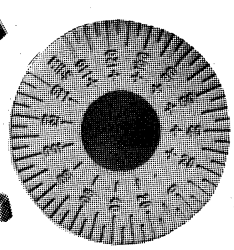
Cat. No.	Material
DE-1	Clear Plexiglass
DE-2	Aluminum 24ST Black Anodized



No. 1341 POINTER, DIAL
3/8″W. × 3/8″H. × 1/8″D.
Pointer Section thickness .025.

Two .078 Dia. Holes 3/16″ Apart.

D2103
3/4″H. × 5/8″ wide
No screws. .136 mounting holes. (Red pointer index)



D0008 DIAL
Cast Aluminum.
1/16″ thick × 159/64″ dia. × 43/64″ center hole.

D0034-(3.7) POINTER
1/4″H. × 49/64″L.
.230 mtg. hole. Aluminum casting.

D0037-(2) POINTER
3/16″H. × 13/32″ dia. × 1 13/64″L. Brass with 1/8″ mounting hole.

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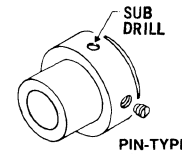
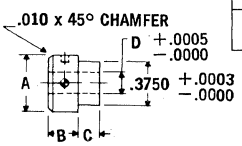
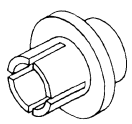
DIAL (AND GEAR) HUBS

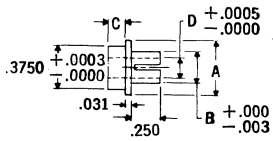




#303 St. Steel-Passivated

Catalog No. Pin-Type	A	B	C	D	Set Screw	Spot Hole
HS62-1-2SS HS62-2-2SS	7/16	.22	.062 .125	.1250	#2-56	.029
HS62-3-3SS HS62-4-3SS	7/16	.22	.062 .125	.1875	#4-40	.040
HS62-5-4SS HS62-6-4SS	1/2	.25	.062 .125	.2500	#6-32	.070



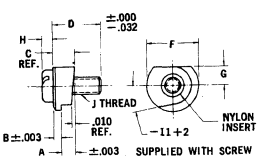


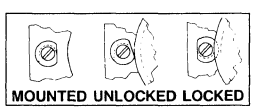
#303 St. Steel-Passivated

Catalog No. Clamp-Type	A	B	C	D
HC63-1-2SS HC63-2-2SS	7/16	.138	.062 .125	.1250
HC63-3-3SS HC63-4-3SS	7/16	.250	.062 .125	.1875
HC63-5-4SS HC63-6-4SS	1/2	.312	.062 .125	.2500
HC63-8-2SS	7/16	.188	.125	.1200
HC63-13-3.88SS	1/2	.312	.125	.2405

MOTOR MOUNT CLEATS

Quick release, self locking, instant nulling, meets shock & vibration requirements.

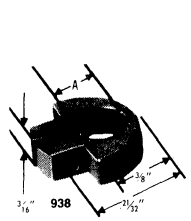


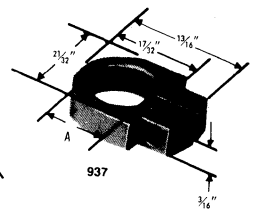


Type Mount	A	B	D	C	E	F	G	H	J	Part No.
Flush & Recess	.031	.040	.071	.312						SMFR3-1
Flush	.062	.040	.102	.312						SMF3-2
Flush	.062	.050	.112	.375						SMS3-3
Flush	.062	.063	.125	.375						SMS3-4
Flush	.078	.063	.141	.375						SMS3-5
Flush	.093	.040	.133	.375	.135	.390	.125	.068	#4-40	SMS3-6
Flush	.093	.050	.143	.375		.385		Max.		SMS3-7
Flush	.093	.063	.156	.375						SMF3-8
Step	.125	.050	.175	.375						SMS3-9
Step	.156	.040	.196	.375						SMS3-10
Step	.225	.063	.288	.437						SMS3-11
Flush	.250	.063	.312	.625						SMF3-12
Flush & Recess	.031	.040	.071	.250						SMFR3-20
Flush	.047	.040	.087	.250	.096	.265	.091	.053	#2-56	SMF3-21
Flush	.062	.040	.102	.250		.260		Max.		SMF3-22
Flush	.093	.040	.133	.312						SMF3-23
Step	.125	.040	.165	.312						SMS3-24
Reverse	.062	.063	.125	*	.135	.390	.125	*	#4-40	SMRV3-30
Reverse	.093	.063	.156	*		.385		*		SMRV3-31

*Reverse type cleat supplied less screw.

"NO-MAR" CLAMPS





Set screw does not touch shaft. Ideal for knob and gear applications. Variety of sizes available.

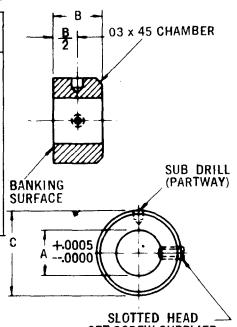
Cat. No.	A Dimensions in Inches -2	-3	-4	-5	-6	-7	-8
937	1/8	3/16	1/4	5/16	3/8	13/32	7/16
938	1/8	3/16	1/4	5/16	3/8	13/32	

PRECISION SET SCREW COLLARS

Material: 303 Stainless Steel
Finish: Clear Passivate 5/64 to 1/2 Bores

Shaft Size	A	B	C	Set Screw	Part No.
5/64	.0779	.12	7/32	#0-80	SC7-07
3/32	.0935	.12	1/4	#0-80	SC8-09
.12	.1200	.18	5/16	#2-56	SC10-120
1/8	.1248	.18	5/16	#2-56	SC10-124
5/32	.1560	.18	5/16	#2-56	SC10-15
3/16	.1873	.22	3/8	#4-40	SC12-18
.24	.2405	.25	1/2	#6-32	SC16-240
1/4	.2498	.25	1/2	#6-32	SC16-249
5/16	.3123	.28	9/16	#6-32	SC18-31
3/8	.3748	.37	3/4	#10-32	SC24-37
1/2	.4998	.50	1	1/4-20	SC32-49

Special Collars Available on Request.



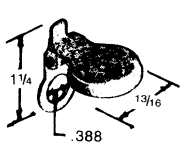
JACK COVERS (TRIMMER COVERS)

Fit jack or panel bushings used to keep out dust and moisture and prevent inadvertent disturbance of control. Outer surfaces finished in standard colors of baked enamel.

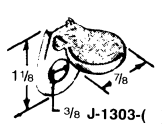
To Order Colors Specify:

(-1) Black Texture; (-2) Smooth Gray; (-3) Smooth Olive; (-4) Smooth Black; (-5) Bright Nickel Plate; (-6) Red (Top section only); (-7) White (Top section only).

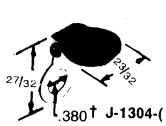
Example: Jack cover, color black texture, order as **J-1301 (-1)**



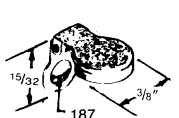
J-1301-( )
*5/16"



J-1303-( )
J-1303-( ) WATERPROOF JACK COVER GASKET & NUT
*13/32"



J-1304-( )
† also available .255 Use P/N J-13044-( )
*1/4"



J-1305-( )
J-1305-( ) SUB-MINI JACK COVER
*13/64

*Overall height in closed position when mounted on panel.

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JAN HARDWARE
MANUFACTURING COMPANY INC.

HI-VOLTAGE INSULATED COUPLINGS U.S. PATENT NO. 2,681,387

MEETS MILITARY SPECIFICATIONS–TEMPERATURE-HUMIDITY - SHOCK - VIBRATION - FUNGUS

HI-VOLTAGE INSULATED COUPLINGS

15 KV Breakdown—10 lb/in. torque
Series No. AK-5079 and No. AK-5164

Stainless steel shaft and screwdriver tip molded-integrally with Diallyl Phthalate per Mil Specs. Shock, vibration and fungus proof, they operate with ease over an ambient temperature range of −75°C to +175°C. Supplied with mounting hardware.

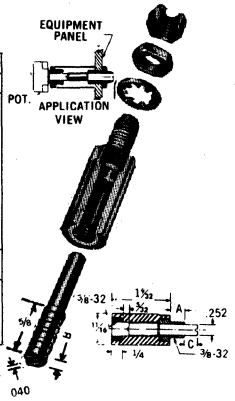
Screwdriver tip fits standard slotted shafts (potentiometer, etc.) without further machining. Suited to adjust high voltage controls protecting operating personnel. Also used to reduce ground capacitance on other types of instrument controls.

For Commercial Instrument Applications... Available in general purpose Bakelite.

STANDARD TYPE

Cat. No.	Dimensions in Inches "A"	"B"	Shaft	"C"
AK-5164-X-1	3/8	3/16	Slotted	5/16
AK-5164-B-1	3/8	1/16	Slotted	5/16
AK-5164-X-2	3/8	3/16	Slotted	15/32
AK-5164-B-2	3/8	1/16	Slotted	15/32
AK-5164-X-3	3/8	3/16	No Slot	15/16
AK-5164-B-3	3/8	1/16	No Slot	15/16
AK-5164-X-4	3/8	3/16	No Slot	17/16
AK-5164-B-4	3/8	1/16	No Slot	17/16
AK-5164-X-5	3/8	3/16	Slotted	Minus 1/16
AK-5164-B-5	3/8	1/16	Slotted	Minus 1/16
WITH LOCKING TYPE BUSHING				
AK-5079-X-1	9/16	3/16	Slotted	1/8
AK-5079-B-1	9/16	1/16	Slotted	1/8
AK-5079-X-2	9/16	3/16	Slotted	9/32
AK-5079-B-2	9/16	1/16	Slotted	9/32

Note: (3/16") to be used with 1/8" long shaft.
(1/16") to be used with 1/4" long shaft.



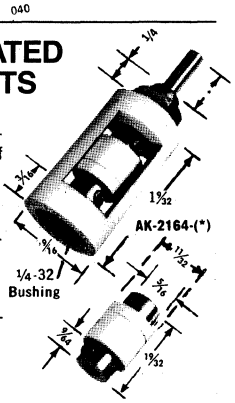
VOLTAGE: 6000VDC INSULATED COUPLINGS FOR 1/8" SHAFTS

Material: Cycalac, Brass, Nickel Plated.
*Insert letter "S" or "N" followed by first two numbers of decimal equivalent, for fractional length of shaft beyond bushing.
"S" = with slot. "N" = no slot.

Typical Part Number: AK-2164-N31 =
5/16" long shaft beyond bushing (standard), no slot. If length is 1" use "X".

AK-2164-SX =
1" long shaft beyond bushing, slotted. If length exceeds 1", use "X" and decimal equivalent for balance of number.

AK-2164-NX31 =
15/16" long shaft beyond bushing, no slot.

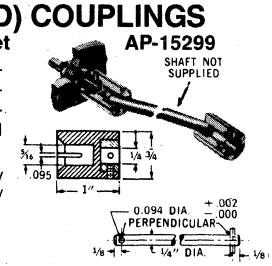


OFFSET-SHAFT (INSULATED) COUPLINGS

10 KV Breakdown **±30° Offset** **AP-15299**

Single-unit, molded Nylon-to-metal insert. Application requires two couplings—permits smooth control for two parallel shafts offset up to 30° at separations greater than 3". Secured to component and control shafts by 2 set screws.

Note: Coupling is accomplished with a 1/4" shaft of any length (not furnished). Coupling shaft keyed to coupler by steel drive pins supplied. See P. C-1596 for shafting.

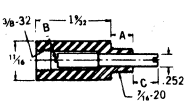


COMMERCIAL INSULATED COUPLINGS

30 KV Breakdown 10 lb-in. Torque.
Withstands 30 KV, made of high grade Bakelite throughout except for stainless steel screwdriver tip molded in drive shaft. Mounting Hardware supplied.

STANDARD TYPE

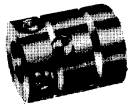
Cat. No.	Dimensions in Inches "A"	"B"	Shaft	"C"
AK-4160-X-1	3/8	3/8	Slotted	1/8
AK-4160-B-1	3/8	3/16	Slotted	1/8
AK-4160-X-2	3/8	3/8	No Slot	1/2
AK-4160-B-2	3/8	3/16	No Slot	1/2



Series No. AK-4160
For TV and Industrial Applications

AUTOLINEAR (INSULATED) SHAFT COUPLINGS

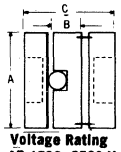
2.5-5 KV Breakdown Universal, Miniature, Self-aligning



Accommodates either similar or dissimilar 1/8", 3/16" or 1/4" shafts. Permits misalignment to 1/16" and 5° angle. Operates free of backlash. Plastic insulator between cast aluminum hubs. Each hub has 2 set screws. Alodine finish. Also available with self-extinguishing low water absorption characteristic plastic insulator on special order.

STANDARD TYPE

Part No.	Dia. Hole	Dimensions in Inches "A"	"B"	"C"
AP-1530-2	1/8	1/2	15/64	59/64 ± 1/32
AP-1530-3	3/16	1/2	15/64	59/64 ± 1/32
AP-1530-4	1/4	1/2	15/64	59/64 ± 1/32
AP-1538-2	1/8	1/2	27/64	17/64 ± 1/32
AP-1538-3	3/16	1/2	27/64	17/64 ± 1/32
AP-1538-4	1/4	1/2	27/64	17/64 ± 1/32



Voltage Rating
AP-1530, 2500 V
AP-1538, 5000 V

Typical Part No.'s
AP-1530-34 accommodates a 3/16" shaft one side, 1/4" shaft on other.
AP-1538-22 accommodates two 1/8" shafts.

1/4" SHAFT COUPLING EXTENDER

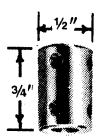
AP-1010
Nickel plated brass with 2 set screws. 1/2" O.D.; 1 3/4" overall length.

AP-1321
Same as above, except extends 1/4" shaft to 1/8", overall length 2 1/2". Aluminum clear iridite.

SHAFT COUPLING

AP-15150
Nickel plated brass coupling for joining two 1/4" shafts. 4 set screws.

Cat. No. AP-15151
Same as above, 2 set screws



AK5610 INSULATED COUPLING

For 1/4" shaft. 3/4" dia. x 5/8" long. Permits linear and angular misalignment up to .005" and/or 10°. Breakdown voltage 3 KV.

AK771 REDUCER INSERT BUSHING

1/2" Hex–1/16" thick. Overall length 9/32".
Adapter with high voltage insulated couplings to accommodate 1/8" shaft potentiometers. 3/8 x 32 O.D., 1/4 x 32 I.D.

REDUCER INSERT

AK678 (1/4" to 3/16")
AK671 (1/4" to 1/8")

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MANUFACTURING COMPANY INC.

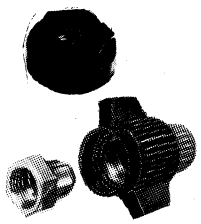
SHAFT LOCKS

One-piece; fits standard 1/4" and 3/8"-32 thread of shaft bushing. Friction grip holds shaft to prevent accidental or vibrational disturbance of control setttings. Adjustment for semi-permanent locking, provided. Note: Part No's. 1047, 1048, 1049 maximum tightening torque—5 lb.-in.

AK-1046 5/16" Hex OD. Metal w/plastic insert.
AK-1048 7/16" Hex OD. Metal w/plastic insert.

AK-1047 5/16" Hex OD. All Plastic.
AK-1049 7/16" Hex OD. All Plastic.

AK-1050 Plastic w/metal insert.



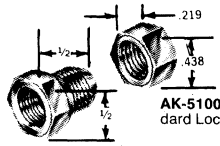
Ordering Data:

Nominal Shaft Dia.	Bushing Thd. Size
2 = 1/8"	4 = 1/4-32
4 = 1/4"	6 = 3/8-32

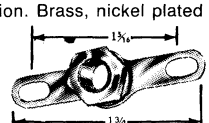
Typical P/N: **AK1049-2-4** = for 1/8" shaft, 1/4-32 bushing.
AK1048-4-6 = for 1/4" shaft, 3/8-32 bushing.

SHAFT LOCKS Split-Bushing, Collet Type

Securely holds shaft in position. Brass, nickel plated body and lock nut.

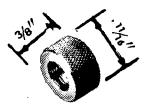


AK-5100 Standard Lock Nut



AK-5101 Panel Mount Type

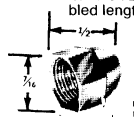
AK-103–For 1/8" shaft—1/4-32 bushing 3/8" Hex Dia., assembled length 1/2.



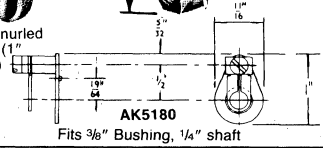
AK-5108 Shaft Lock, Knurled 3/8-32 THD 11/16 dia. x 3/8 long

AK-5109–For 1/8" shaft. 1/4-28 bushing (7/32" long x 5/16" dia.)

AK-5106 Knurled Shaft Lock (1" O.D. Knurl)



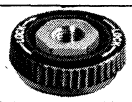
AK-5107 Lock Nut (Round Head)



AK5180
Fits 3/8" Bushing, 1/4" shaft

SHAFT KNOB LOCK

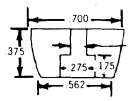
Prevents movement of controls due to shock, vibration, or accidental contact. Available matte or glossy finish.



Cat. No.
AK-1057-2 (*) (1/8" shaft) (Used with 91 Series Knob)
AK-1057-4 (*) (1/4" shaft) (Used with 121 Series Knob)
(Used with 71 Series Knob) **AK-1061-4** (*) (1/4" shaft)
AK-1059-4 (*) (1/4" shaft)
*Specify "M" or "G" for matte or glossy finish.

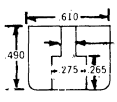
Typical Part Numbers:
AK-1057-2MA = For 1/8" Shaft/matte finish/Black
AK-1059-4GA = For 1/4" Shaft/glossy finish/Black

CHASSIS AND CABINET BUMPERS



AK-575

AK-574

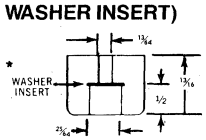


Low-friction polyethylene. Guards against scuffing. Supplied in either black or russet brown, with recessed hole for screw or bolt usage.
To Order Colors: Black, specify (4); Brown, specify (7).
Other colors on request.
AK-574 also available in white nylon; thru hole .187 dia., C bore 3/8". Specify No. AK-577-8.

NO. AK-576-4 HEAVY DUTY CHASSIS AND CABINET BUMPER (WITH STEEL WASHER INSERT)

Molded neoprene. 1" diameter, 13/16" high. Configuration similar to AK-574 above. Color: Black. Other colors on request.

*No. AK-162610-4 New, improved non-marring, high tear strength, neoprene.



RECESSED BUMPERS

PART NO.	A MAX. DIAM.	B HGT.	C SCREW HEAD DEPTH	D SCREW SHAFT DEPTH	E SCREW BASE OPENING	F SCREW SHAFT WIDTH	NOMINAL DURO-METER	FIG. NO.
REC-2082S	5/8	1/2	1/4	1/4	5/32	5/32	75	1
REC-2084S	3/4	3/8	3/16	3/16	7/16	3/16	75	1
REC-2081S	5/8	5/16	3/16	1/8	1/4	3/16	75	2

Suffix S—Steel Washer Insert

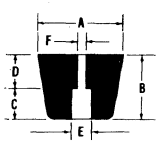
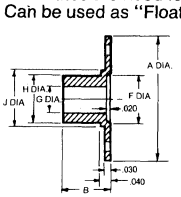


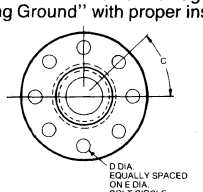
FIG 1

FIG 2

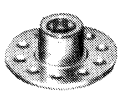
STUD, GROUND Multi-termination ground lugs.

- **Electrically sound • Easily Installed • Space Saving**
- Provides equipotential chassis termination for ground leads.
- Minimizes resistance between circuit contacts and ground point.
- Diminishes noise, pick-up and regenerative feedback.
- Eliminates the need for buss bars or stacks of lugs.
- Can be used as "Floating Ground" with proper insulation.





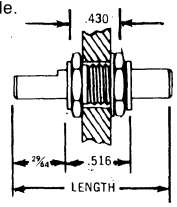
Material: Brass, Half Hard
Finish: Tin Plate

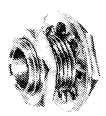


Part No.	A	B	C	D	E	F	G	H	J
G 1001	3/4"	5/16"	30°	1/16" Dia. 12 Holes	9/16"	21/64"	3/16"	5/16"	23/64"
G 5008	3/4"	1/4"	36°	5/64" Dia. 10 Holes	9/16"	21/64"	3/16"	5/16"	23/64"
G 7004	1/2"	9/32"	45°	1/16" Dia. 8 Holes	25/64"	17/64"	5/32"	7/32"	19/64"

PANEL BEARING AND SHAFT ASSEMBLIES Cat. No. AP-15350 Series

For rotary control of components. Stainless steel shaft 1/4" dia. one end flatted completely assembled with retaining rings, jam nut and lock washer. Nickel plated, brass panel bearing. Fits panels up to 3/16" thick; mounts in 13/32" dia. hole.

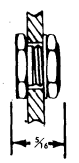




AP-15350

AP-15350( )

Cat. No.	Item	"L" Shaft Length
AP-15350	Panel Bearing	—
AP-15350-1	Panel Bearing & Shaft Assembly	15/16"
AP-15350-2		3"
AP-15350-3		6"



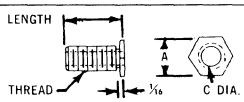
Cat. No. AK-5511 Panel Bearing Assembly
Shafts available on special order.

Also available as Nylon Panel Bearing

BUSHING, PANEL FOR 1/4 AND 1/8 SHAFT

Typical Pt. No. PB 60814-B = 1/4-28 Thd., 1/2 Lg. Brass w/.127 Hole.

Bushing can be supplied with Mtg. nut and int. tooth lockwasher. Available with special nylon bearings.



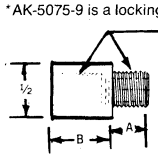
"C" Dia. .127 .252
Thread 1/4-28 3/8-32

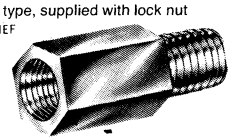
Lgth.	A=3/8 1/4-28 Thread	A=1/2 3/8-32 Thread
3/8	PB 60614	PB 80638
7/16	PB 60714	PB 80738
1/2	PB 60814	PB 80838
5/8	PB 61014	PB 81038
3/4	PB 61214	PB 81238
7/8	PB 61414	PB 81438

BUSHING EXTENDERS AK-5075-1 thru AK-5075-11

Permit staggered mounting of components having 1/4" shafts, behind a panel. Nickel plated brass.

Note: *AK-5075-9 is a locking (collet) type, supplied with lock nut





AK-5075 ( )

DIMENSIONS IN INCHES

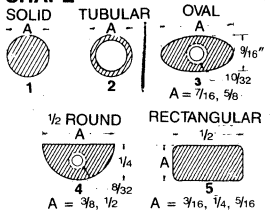
Cat. No.	"B"	"A"	Cat. No.	"B"	"A"
AK-5075-1	5/8	3/8	AK-5075-6	15/8	1/4
AK-5075-2	5/8	1/4	AK-5075-7	17/16	3/16
AK-5075-3	5/8	3/16	AK-5075-8	11/16	1/4
AK-5075-4	3/4	1/4	*AK-5075-9	11/16	1/2
AK-5075-5	21/4	1/4	AK-5075-10	121/64	7/16
			AK-05975-11	55/64	7/16

Specials Are Our Specialty

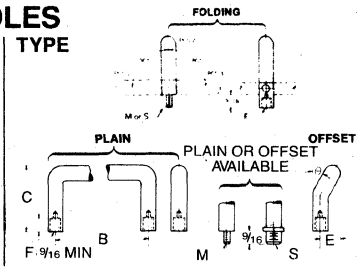
JAN HARDWARE
MANUFACTURING COMPANY INC.

EQUIPMENT HANDLES

SHAPE



TYPE



HOW TO SPECIFY TYPE OF HANDLE

*TYPE	PREFIX	DESCRIPTION
PLAIN	NONE	—
OFFSET	ϕ, E	—
FOLDING	A	A = FREE 180°
	B	B = 2 POS., DETENT, 90°
	C	C = 3 POS., DETENT, 90°

A DIA.	3/16	1/4	5/16	3/8	7/16	1/2
M, F	4-40	8-32	10-32	10-32	10-32	10-32
S	10-32	1/4-28	5/16-24	3/8-24	3/8-24	3/8-24

RECOMMENDED CARRYING LOAD (lbs.) BASED ON HUMAN ENGINEERING FACTORS

A DIA.	1/4	3/8	1/2	5/8	3/4
JAN STD. (lbs.) MIL STD. 1472 (lbs. max.)	10-15 15	15-20 —	20-30 20	30-40 —	40-50 40

TYPICAL PART NUMBER

	H	OB	1	M	04	D03	A02	X
308	H	OA	1	F	10	C09	B08	A
A	H	SS	2	S	08	D00	A03	P

TYPE* (PREFIX) — H (HANDLE) — MATERIAL — SHAPE — THREAD M, F or S — FINISH — C DIMENSION — B DIMENSION — A DIA. OR WIDTH

Plain Handle Brass, Shape 1, Male Thd., A = 1/4 O.D., B = 43/16, C = 1 1/8, Black Oxide Finish.
30°, Offset, E = 1/2, Aluminum, Shape 1. Female Thd., A = 5/8 O.D., B = 39/16, C = 2 1/2, Blk. Anodized.
Folding Handle, 180°, Free. Stainless Steel, Shape 2. A = 1/2 Dia., B = 4", C = 1 1/2, Passivate, 3/8-24 thd.

MATERIAL
- **A** — ALUMINUM
- **B** — BRASS
- **S** — COLD ROLLED STEEL
- **SS** — STAINLESS STEEL

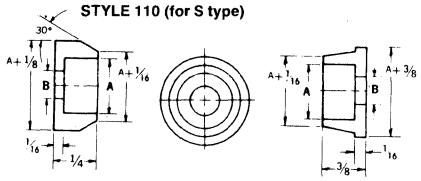
FINISH
- **A** — BLACK ANODIZE
- **B** — OPTICAL BLACK
- **C** — CLEAR ANODIZE
- **E** — SATIN ETCH
- **N** — NICKEL PLATE
- **X** — BLACK OXIDE
- **P** — PASSIVATE
- **O** — NO FINISH
- **BF**—BRUSH FINISH-NO PLATING

DIMENSION:
- θ Specify in Degrees
- **A, E** Specify in 1/8 increments
- **C, B** Specify with Letter + Fraction in 1/8 increments

LETTER VALUE:
A thru Z = 1 thru 26. When Specifying dimension in 1/16 increments, use numerator of fraction for Part No. See Examples.

FERRULES

STYLE 100 (for M or F type)
STYLE 110 (for S type)



STYLE 200 (for M or F type)
STYLE 210 (for S type)

HF OB 100 05 10 X

DESIGNATION — MATERIAL — STYLE — FINISH — A DIA. — B DIA.

NOTES: "A" dimension is specified in 1/16 increments using numerator of fraction for part No.
"B" Dia. is clearance hole. For thd., see table. For material and finish, see above. See examples.
Ferrule Brass, Style 100, A = 5/16 Dia. B = clearance for 10-32, Black Oxide

Thd. size	4-40	6-32	8-32	10-32	1/4-24	3/8-24
B	04	06	08	10	25	38

Note: Dimensions and configurations shown are approximate.

JOLTA SHOCK TEST MACHINES

For Reproducible Impact-Shock Test Pulses. Engineered to reproduce the entire spectrum of all significant impact shock waves.

FEATURES
- Economical
- Rugged
- Simple to Operate
- Uniformly Accurate

Designed for laboratory and production testing of light to medium weight components. Produced to meet practically all requirements of common Mil. Spec. qualification tests (JAN-S-44, Mil-Std. 202A, MIL-T-12679A). Each JOLTA is electronically calibrated to certify compliance with test specifications.

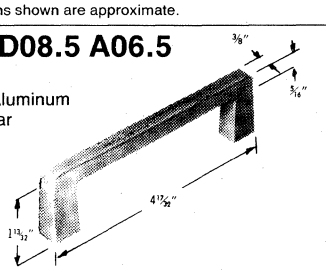
JOLTA—Floor Model No. F-3003-C1, C2, C3—Precision-machined magnesium casting utilized for higher shock amplitudes. Typical tests with these units 50 to 5000 G at .2 to 11.0 milisecs. For high impact testing, accessory springs and twin anvil combinations yield impulses of 0.2 millisecs to 5000G.

SPECIFICATIONS—JOLTA SHOCK TESTERS

Model No.	Carriage Volume	Test Weight	"G" Ranges
F-3003-C-1	5" cube	0-12 lbs	50-1500
F-3003-C-2	5" cube	0-4.0 lbs.	350-5000

H0A5F 3/8 × 5/16 D08.5 A06.5 HANDLE

1 13/32" H. × 4 17/32" centers. Aluminum casting, 3/8" × 5/16" rectangular gripping section.

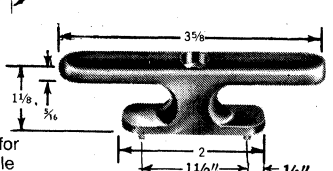


HANDLE, CORD

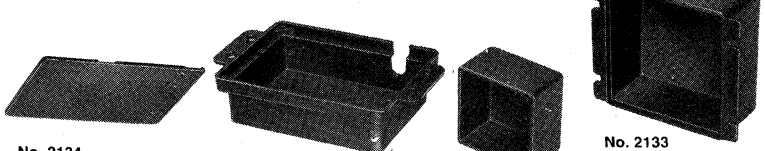
Cat. No. H-692

Colors:
(-1) Grey
(-2) Black
Special Colors on request

Die-cast aluminum handle designed for use on small instrument panels. Single integral hole accepts No. 10 screw. Dia. of pins 3/16" × .078H.



MOLDED PLASTIC BOXES



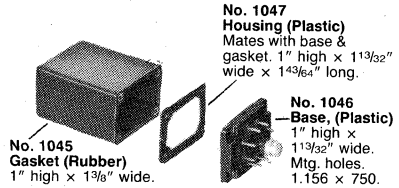
No. 2134
3 3/8" × 2 1/2" × 5/64" thick.
Note: Fits into large box.

No. 2136
3 3/32" × 2 9/32" × 25/32 depth.
5/64" Wall Thickness.

No. 2135
2 19/64 × 2 19/64 × 1 11/64"
depth 3/32" Wall Thickness.

No. 2133
1 3/8" L. × 1 3/8" W. × 27/32"
depth 1/16" Wall Thickness.

CRYSTAL BOX



No. 1047
Housing (Plastic)
Mates with base & gasket. 1" high × 1 13/32" wide × 1 43/64" long.

No. 1045
Gasket (Rubber)
1" high × 1 3/8" wide.

No. 1046
—Base, (Plastic)
1" high × 1 13/32" wide. Mtg. holes. 1.156 × 750.

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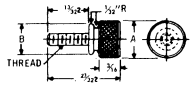
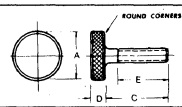
JAN HARDWARE
MANUFACTURING COMPANY INC.

THUMB SCREW
Pt. No. TS 6058-B = 8.32 x 13/32 Lg. Thread. Thumb Screw-Brass.

Thread	A Dia.	B Dia.	Pt. No.
6-32	3/8 7/16 1/2	5/16 3/8 7/16	TS 6056 TS 7066 TS 8076
8-32	3/8 7/16 1/2	5/16 3/8 7/16	TS 6058 TS 7068 TS 8078
10-32	3/8 7/16 1/2	5/16 3/8 7/16	TS 60510 TS 70610 TS 80710



KNURLED THUMB SCREWS
Material: 303 Stainless Steel



Thread	A	C	D	E	Part No.
#4-40	1/4	3/8	1/8	5/16	ST4010
	1/4	1/2	1/2	7/16	ST4011
	1/4	3/4	1/2	5/8	ST4012
	3/8	3/8	1/8	5/16	ST4013
	3/8	1/2	1/8	7/16	ST4014
#6-32	1/4	1/2	1/2	7/16	ST6015
	1/4	3/4	1/2	5/8	ST6016
	1/4	1	1/2	13/16	ST6017
	3/8	3/8	1/8	5/16	ST6018
	3/8	1/2	1/8	3/8	ST6019
#8-32	1/4	1/2	1/2	7/16	ST8020
	1/4	3/4	1/2	5/8	ST8021
	1/4	1	1/2	13/16	ST8022
	3/8	3/8	1/8	5/16	ST8023
	3/8	1/2	1/8	3/8	ST8024
#10-24	3/8	1/2	3/16	7/16	ST11025
	3/8	3/4	3/16	5/8	ST11026
	3/8	1	3/16	13/16	ST11027
	3/8	1 1/4	3/16	1	ST11028
	1/2	3/4	3/16	5/8	ST11029
	1/2	1	3/16	13/16	ST11030
	1/2	1 1/4	3/16	1	ST11031
	1/2	1 1/2	3/16	1 1/4	ST11032
	3/4	3/4	3/16	5/8	ST11033
	3/4	1	3/16	13/16	ST11034

Thread	A	C	D	E	Part No.
#10-24	3/4	1 1/4	3/16	1	ST11035
	3/4	1 1/2	3/16	1 1/4	ST11036
#10-32	3/8	1/2	3/16	7/16	ST10037
	3/8	3/4	3/16	5/8	ST10038
	3/4	1	3/16	13/16	ST10039
	3/8	1 1/4	3/16	1	ST10040
	1/2	3/4	3/16	5/8	ST10041
	1/2	1	3/16	13/16	ST10042
	1/2	1 1/4	3/16	1	ST10043
	1/2	1 1/2	3/16	1 1/4	ST10044
	3/4	3/4	3/16	5/8	ST10045
	3/4	1	3/16	13/16	ST10046
	3/4	1 1/4	3/16	1	ST10047
	3/4	1 1/2	3/16	1 1/4	ST10048
1/4-20	3/4	3/4	3/16	5/8	ST14049
	3/4	1	3/16	13/16	ST14050
	3/4	1 1/4	3/16	1	ST14051
	3/4	1 1/2	3/16	1 1/4	ST14052
	3/4	2	3/16	1 5/8	ST14053
	1	3/4	3/16	5/8	ST14054
	1	1	3/16	13/16	ST14055
	1	1 1/4	3/16	1	ST14056
	1	1 1/2	3/16	1 1/4	ST14057
	1	2	3/16	1 5/8	ST14058

SET SCREWS
SOCKET HEAD Class 3A Thread Stainless Steel

Screw Size	L	Part No.
#0-80	1/8	SS-T-1
	3/16	SS-T-2
#2-56	1/8	SS-T-3
	3/16	SS-T-4
	1/4	SS-T-5
#4-40	1/8	SS-T-6
	3/16	SS-T-7
	1/4	SS-T-8
#6-32	1/8	SS-T-9
	1/4	SS-T-10
	3/8	SS-T-11
	1/2	SS-T-12

Screw Size	L	Part No.
#8-32	1/4	SS-T-13
	3/8	SS-T-14
	1/2	SS-T-15
	5/8	SS-T-16
#10-32	1/4	SS-T-17
	1/2	SS-T-18
	3/4	SS-T-19
	1	SS-T-20
1/4-20	1/4	SS-T-21
	1/2	SS-T-22
	3/4	SS-T-23
	1	SS-T-24
	1 1/4	SS-T-25

SLOTTED HEAD
Cup Point Stainless Class 2A Thread

Screw Size	L	Part No.
#0-08	1/8	SS-D-15
#0-80	3/16	SS-D-16
#2-56	1/8	SS-D-1-A

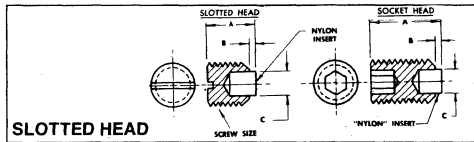
Screw Size	L	Part No.
#4-40	1/8	SS-D-2-A
#6-32	1/8	SS-D-3-A

SOCKET HEAD KEYS & SETS
Material: Steel (Nickel Plated)
Set of Hex Socket Head Keys Containing 8 Keys from .050 to 5/32 Key Size—in case. Order SS-K-50.

Screw Size	Key Size	Part No.
#2	.035	SS-K-40
#4	.050	SS-K-41
#6	1/16	SS-K-42
#8	5/64	SS-K-43
#10	3/32	SS-K-44

Screw Size	L	Part No.
1/4	1/8	SS-K-45
5/16	5/32	SS-K-46
3/8	3/16	SS-K-47
1/2	1/4	SS-K-48

SET SCREWS CON'T.
Material: Screw—Stainless Steel; Insert—Nylon Protective Tip



SLOTTED HEAD

Screw Size	A	B	C	Part No.	Screw Size	A	B	C	Part No.
#2-56	5/32	1/32	1/32	SSN-D-1	#10-24	15/64	3/64	3/32	SSN-D-5
#4-40	5/32	1/32	1/16	SSN-D-2	#10-32	15/64	3/64	3/32	SSN-D-6
#6-32	5/32	1/32	1/16	SSN-D-3	1/4-20	5/16	1/16	1/8	SSN-D-7
#8-32	15/64	3/64	1/16	SSN-D-4					

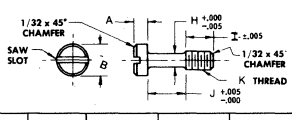
SOCKET HEAD

Screw Size	A	B	C	Part No.	Screw Size	A	B	C	Part No.
#2-56	5/32	1/32	1/32	SSN-T-8	#10-32	43/64	3/64	3/32	SSN-T-29
	9/32	1/32	1/32	SSN-T-24	1/4-20	5/16	1/16	1/8	SSN-T-14
#4-40	5/32	1/32	1/16	SSN-T-9		7/16	1/16	1/8	SSN-T-19
	9/32	1/32	1/16	SSN-T-25		13/16	1/16	1/8	SSN-T-30
	13/32	1/32	1/16	SSN-T-26		1 1/16	1/16	1/8	SSN-T-31
#6-32	5/32	1/32	1/16	SSN-T-10	1/4-28	7/16	1/16	1/8	SSN-T-20
	9/32	1/32	1/16	SSN-T-15	5/16-18	19/32	3/32	3/16	SSN-T-21
	13/32	1/32	1/16	SSN-T-27		27/32	3/32	3/16	SSN-T-32
#8-32	15/64	3/64	3/32	SSN-T-11		13/32	3/32	3/16	SSN-T-33
	27/64	3/64	3/32	SSN-T-16	3/8-16	19/32	3/32	3/16	SSN-T-22
	43/64	3/64	3/32	SSN-T-28		27/32	3/32	3/16	SSN-T-34
#10-24	15/64	3/64	3/32	SSN-T-12		13/32	3/32	3/16	SSN-T-35
	27/64	3/64	3/32	SSN-T-17	1/2-13	3/4	1/8	1/4	SSN-T-23
#10-32	15/64	3/64	3/32	SSN-T-13		1 1/8	1/8	1/4	SSN-T-36
	27/64	3/64	3/32	SSN-T-18					

THREADED ROD
—1/4-20 THREAD—2" EACH END

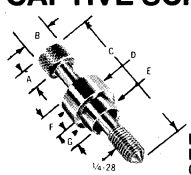
Lgth.		Lgth.		Lgth.		Lgth.		Lgth.		Lgth.	
4 1/2	TR 1445	7	TR 1470	9 1/2	TR 1495	12	TR 14120	14 1/2	TR 14145	17 1/2	TR 14175
5	TR 1450	7 1/2	TR 1475	10	TR 14100	12 1/2	TR 14125	15	TR 14150	18	TR 14180
5 1/2	TR 1455	8	TR 1480	10 1/2	TR 14105	13	TR 14130	15 1/2	TR 14155	18 1/2	TR 14185
6	TR-1460	8 1/2	TR 1485	11	TR 14110	13 1/2	TR 14135	16	TR 14160	19	TR 14190
6 1/2	TR 1465	9	TR 1490	11 1/2	TR 14115	14	TR 14140	16 1/2	TR 14165	19 1/2	TR 14195
								17	TR 14170	20	TR 14200

CAPTIVE SCREWS
Material: 303 Stainless Steel

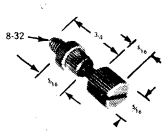


Thickness For Panel	A	B	H	I	J	K Thread	Part No.
1/16	1/8	1/4	.072	.187	.281	#4-40	CS4-1
1/8	1/8	1/4	.072	.187	.343		CS4-2
1/16	1/8	9/32	.086	.218	.312		CS6-1
1/8	1/8	9/32	.086	.218	.375	#6-32	CS6-2
3/16	1/8	9/32	.086	.218	.437		CS6-3
1/8	5/32	5/16	.114	.250	.406		CS8-2
3/16	5/32	5/16	.114	.250	.468	#8-32	CS8-3
1/4	5/32	5/16	.114	.250	.531		CS8-4
3/16	3/16	3/8	.136	.312	.531	#10-32	CS10-3
1/4	3/16	3/8	.136	.312	.593		CS10-4

CAPTIVE SCREW AND NUT ASSEMBLY



Cat. No. AP-1197
Screw, Captive
1/16" slotted knurled head (7/16" O.D.)
1 1/4" overall length; 8-32 thread.



Cat. No. AP-1040
Screw, Captive
Cat. No. AP-1039
Insert, Captive

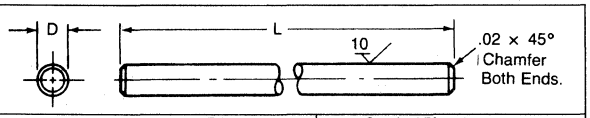
No. CS-711-(1)
No. CS-711-(2) (screw only)
Consists of slotted, knurled thumb screws made of corrosion resistant steel bar, and nickel-plated (on brass) panel inserts.

	A	B	C	D	E	F	G	J Thd.
—1	1/4	3/8	15/16	9/16	13/32	5/16	3/8	1/4-28
—2	1/4	29/64	17/16	9/16	13/32	5/16	3/8	8-32

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

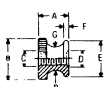
PRECISION GROUND SHAFTS
Material: .303 Stainless Steel



Tolerance	Standard Diameters 1/16" Increments
Shaft Dia. (D) PGS1= +.0000 −.0001	2=.1247
PGS2= +.0000 −.0002	3=.1872
	4=.2497
PGS3= +.0000 −.0003	5=.3125
	6=.3747

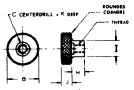
To specify: add (D) dia. x (L) length to prefix above.
I.E. PGS1–2 x 6.375 = .1247 +.0000 −.0001 Dia. x 6.375 Long.
PGS2–3 x 3.250 = .1872 +.0000 −.0002 Dia. x 3.250 Long.
PGS3–4 x 8.625 = .2497 +.0000 −.0003 Dia. x 8.625 Long.

THUMB NUT KNURLED



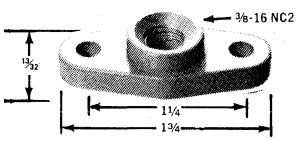
Thread	A	B Dia.	C Dia.	D Dia.	E Dia.	F	G	R Rad.	Part No.
4-36	1/4	3/8	1/8	.147	5/16	3/64	7/72	3/64	KN 436
4-40	1/4	3/8	1/8	.147	5/16	3/64	7/32	3/64	KN 440
6-32	1/4	3/8	9/64	.169	5/16	3/64	7/32	3/64	KN 632
6-32	9/32	13/32	9/64	13/64	11/32	3/64	7/32	1/16	KN 6321
8-32	5/16	7/16	11/64	15/64	3/8	1/16	1/4	1/16	KN 832
10-24	21/64	1/2	13/64	17/64	7/16	1/16	9/32	.070	KN 124
10-32	21/64	1/2	13/64	17/64	7/16	1/16	9/32	.070	KN 132
12-24	11/32	9/16	7/32	19/64	1/2	1/16	21/64	.070	KN 224
1/4-20	3/8	5/8	17/64	21/64	9/16	1/16	23/64	5/64	KN 420

KNURLED THUMB NUTS
Material: 303 Stainless Steel



Thread	B. Dia.	C	H	I	J	K	Part No.
#4-40	1/2	1/8	1/4	1/4	1/8	1/8	NK4070
	1/2	1/8	1/2	1/4	1/8	3/8	NK4071
	3/4	1/8	1/4	1/4	1/8	1/8	NK4072
	3/4	1/8	1/2	1/4	1/8	3/8	NK4073
#6-32	1/2	#26	1/4	1/4	1/8	3/32	NK4074
	1/2	#26	1/2	1/4	1/8	11/32	NK4075
	3/4	#26	1/4	1/4	1/8	3/32	NK4076
	3/4	#26	1/2	1/4	1/8	11/32	NK4077
#8-32	1/2	—	1/4	5/16	1/8	—	NK4078
	1/2	#15	1/2	5/16	1/8	1/4	NK4079
	3/4	—	1/4	5/16	1/8	—	NK4080
	3/4	#15	1/2	5/16	1/8	1/4	NK4081
#10-24	1/2	—	1/4	3/8	3/16	—	NK4082
	1/2	13/64	1/2	3/8	3/16	1/4	NK4083
	1	—	1/4	3/8	3/16	—	NK4084
	1	13/64	1/2	3/8	3/16	1/4	NK4085
#10-32	1/2	—	1/4	3/8	3/16	—	NK4086
	1/2	13/64	1/2	3/8	3/16	1/4	NK4087
	1	—	1/4	3/8	3/16	—	NK4088
	1	13/64	1/2	3/8	3/16	1/4	NK4089
1/4-20	3/4	—	1/4	1/2	1/4	—	NK4090
	3/4	17/64	1/2	1/2	1/4	1/4	NK4091
	1	—	1/4	1/2	1/4	—	NK4092
	1	17/64	1/2	1/2	1/4	1/4	NK4093
	1	17/64	3/4	1/2	1/4	1/2	NK4094

RETAINER NUT
Cat. No. R-1030



Used in conjunction with captive screw and nut assemblies. Die casting. Can be painted. Other thread sizes available upon special order.

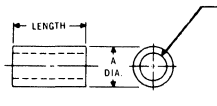
FINISH

CA = Clear Anodize
P = Passivate
A = Black Anodize
I = Iridite #14 (Golden Yellow)
C = Cadmium Plate
CCC = Cadmium Plate and Clear Chromate
N = Nickel Plate
X = Black Oxide
ZD= Zinc Dichromate

MATERIALS

B = Brass
A = Aluminum
SS = Stainless Steel
S = Steel
N = Nylon
PH = Phenolic
T = Teflon

STANDOFFS
SPACER-THRU HOLE



Clearance Hole	Code
.091 Dia. (No. 2 Screw)	1
.116 Dia. (No. 4 Screw)	2
.141 Dia. (No. 6 Screw)	3
.171 Dia. (No. 8 Screw)	4
.194 Dia. (No. 10 Screw)	5
.219 Dia. (No. 12 Screw)	6
.257 Dia. (No. 1/4 Screw	7
.312 Dia.	8

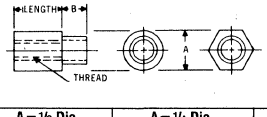
Length	A=1/8	A=3/16	A=1/4	Length	A=3/16	A=1/4
1/16	SP 021	SP 031		11/16	SP 0311	SP 0411
1/8	SP 022	SP 032	SP 042	3/4	SP 0312	SP 0412
3/16	SP 023	SP 033	SP 043	7/8	SP 0314	SP 0414
1/4	SP 024	SP 034	SP 044	15/16	SP 0315	SP 0415
5/16	SP 025	SP 035	SP 045	1	SP 0316	SP 0416
3/8	SP 026	SP 036	SP 046	1 1/8		SP 0418
7/16	SP 027	SP 037	SP 047	1 1/4		SP 0420
1/2	SP 028	SP 038	SP 048	1 3/8		SP 0422
9/16	SP 029	SP 039	SP 049	1 1/2		SP 0424
5/8		SP 0310	SP 0410			

EXAMPLE (TO ORDER) Pt. No. SP 035-2-B = 3/16 Dia. x 5/16 Lg. Spacer-Brass w/.116 Clearance Hole for #4 Screw.

Length	A=5/16	A=3/8	A=1/2	Length	A=5/16	A=3/8	A=1/2
1/8	SP 052	SP 062	SP 082	7/8	SP 0514	SP 0614	SP 0814
3/16	SP 053	SP 063	SP 083	15/16	SP 0515	SP 0615	SP 0815
1/4	SP 054	SP 064	SP 084	1	SP 0516	SP 0616	SP 0816
5/16	SP 055	SP 065	SP 085	1 1/8	SP 0518	SP 0618	SP 0818
3/8	SP 056	SP 066	SP 086	1 1/4	SP 0520	SP 0620	SP 0820
7/16	SP 057	SP 067	SP 087	1 3/8	SP 0522	SP 0622	SP 0822
1/2	SP 058	SP 068	SP 088	1 1/2	SP 0524	SP 0624	SP 0824
9/16	SP 059	SP 069	SP 089	1 5/8		SP 0626	SP 0826
5/8	SP 0510	SP 0610	SP 0810	1 3/4		SP 0628	SP 0828
11/16	SP 0511	SP 0611	SP 0811	1 7/8		SP 0630	SP 0830
3/4	SP 0512	SP 0612	SP 0812	2		SP 0632	SP 0832

EXAMPLE (TO ORDER) Pt. No. SP 064-3-PH = 3/8 Dia. x 1/4 Lg. Spacer-Phenolic w/141 Clearance Hole for #6 Screw.

STANDOFF–RIVET
–HEX AND ROUND



Code	Board Thickness	Shank B
1	1/32	.075
2	1/16	.105
3	3/32	.135
4	1/8	.165
5	3/16	.230
6	1/4	.290

Length	A=1/8 Dia. 0-80 Thread		A=1/4 Dia. 2-56 Thread		A=5/16 Dia. 4-40 Thread		A=3/8 Dia. 6-32 Thread	
	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	RR 202	RH 202	RR 4022	RH 4022	RR 5024	RH 5024	RR 6026	RH 6026
3/16	RR 203	RH 203	RR 4032	RH 4032	RR 5034	RH 5034	RR 6036	RH 6036
1/4	RR 204	RH 204	RR 4042	RH 4042	RR 5044	RH 5044	RR 6046	RH 6046
5/16	RR 205	RH 205	RR 4052	RH 4052	RR 5054	RH 5054	RR 6056	RH 6056
3/8	RR 206	RH 206	RR 4062	RH 4062	RR 5064	RH 5064	RR 6066	RH 6066
7/16	RR 207	RH 207	RR 4072	RH 4072	RR 5074	RH 5074	RR 6076	RH 6076
1/2	RR 208	RH 208	RR 4082	RH 4082	RR 5084	RH 5084	RR 6086	RH 6086
9/16	RR 209	RH 209	RR 4092	RH 4092	RR 5094	RH 5094	RR 6096	RH 6096
5/8	RR 210	RH 210	RR 4102	RH 4102	RR 5104	RH 5104	RR 6106	RH 6106
11/16	RR 211	RH 211	RR 4112	RH 4112	RR 5114	RH 5114	RR 6116	RH 6116
3/4	RR 212	RH 212	RR 4122	RH 4122	RR 5124	RH 5124	RR 6126	RH 6126
7/8	RR 214	RH 214	RR 4142	RH 4142	RR 5144	RH 5144	RR 6146	RH 6146
1	RR 216	RH 216	RR 4162	RH 4162	RR 5164	RH 5164	RR 6166	RH 6166

EXAMPLE (TO ORDER) Pt. No. RR 4052-2-B = 1/4 Dia. x 5/16 Lg. Round, Rivet Stand-off-Brass w/2-56 Thread Shank = .105 for 1/16 Board.

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

FINISH

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C = Cadmium Plate
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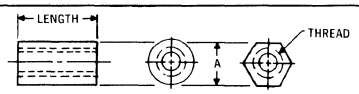
N = Nickel Plate
X = Black Oxide
ZD = Zinc Dichromate

MATERIALS

B = Brass
A = Aluminum
SS = Stainless Steel
S = Steel
N = Nylon
PH = Phenolic
T = Teflon

STANDOFF–THREADED
–HEX & ROUND



MATERIALS B = Brass A = Aluminum SS = Stainless Steel PH = Phenolic
SPECIAL SIZES AND MATERIALS/MANUFACTURED TO ORDER

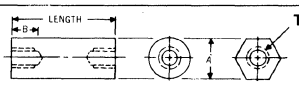
	A = 1/8 Dia. 0-80 Thread		A = 3/16 Dia. 2-56 Thread		A = 3/16 Dia. 4-40 Thread	
Lgth.	Round	Hex	Round	Hex	Round	Hex
1/16	SR 201	SH 201	SR 3012	SH 3012	SR 3014	SH 3014
1/8	SR 202	SH 202	SR 3022	SH 3022	SR 3024	SH 3024
3/16	SR 203	SH 203	SR 3032	SH 3032	SR 3034	SH 3034
1/4	SR 204	SH 204	SR 3042	SH 3042	SR 3044	SH 3044
5/16	SR 205	SH 205	SR 3052	SH 3052	SR 3054	SH 3054
3/8	SR 206	SH 206	SR 3062	SH 3062	SR 3064	SH 3064
7/16	SR 207	SH 207	SR 3072	SH 3072	SR 3074	SH 3074
1/2	SR 208	SH 208	SR 3082	SH 3082	SR 3084	SH 3084
9/16	SR 209	SH 209	SR 3092	SH 3092	SR 3094	SH 3094
5/8	SR 210	SH 210	SR 3102	SH 3102	SR 3104	SH 3104
3/4	SR 212	SH 212	SR 3122	SH 3122	SR 3124	SH 3124
1			SR 3162	SH 3162	SR 3164	SH 3164

EXAMPLE (TO ORDER) Pt. No. SR 3032-A = 3/16 Dia. x 3/16 Lg. Round, Standoff-Aluminum w/2-56 Threaded Hole.

	A = 1/4 Dia.							
	4-40 Thread		6-32 Thread		8-32 Thread		10-32 Thread	
Lgth.	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	SR 4024	SH 4024	SR 4026	SH 4026	SR 4028	SH 4028	SR 40210	SH 40210
3/16	SR 4034	SH 4034	SR 4036	SH 4036	SR 4038	SH 4039	SR 40310	SH 40310
1/4	SR 4044	SH 4044	SR 4046	SH 4046	SR 4048	SH 4048	SR 40410	SH 40410
5/16	SR 4054	SH 4054	SR 4056	SH 4056	SR 4058	SH 4058	SR 40510	SH 40519
3/8	SR 4064	SH 4064	SR 4066	SH 4066	SR 4068	SH 4068	SR 40610	SH 40610
7/16	SR 4074	SH 4074	SR 4076	SH 4076	SR 4078	SH 4078	SR 40710	SH 40710
1/2	SR 4084	SH 4084	SR 4086	SH 4086	SR 4088	SH 4088	SR 40810	SH 40810
9/16	SR 4094	SH 4094	SR 4096	SH 4096	SR 4098	SH 4098	SR 40910	SH 40910
5/8	SR 4104	SH 4104	SR 4106	SH 4106	SR 4108	SH 4108	SR 41010	SH 41010
3/4	SR 4124	SH 4124	SR 4126	SH 4126	SR 4128	SH 4128	SR 41210	SH 41210
7/8	SR 4144	SH 4144	SR 4146	SH 4146	SR 4148	SH 4148	SR 41410	SH 41410
1	SR 4164	SH 4164	SR 4166	SH 4166	SR 4168	SH 4168	SR 41610	SH 41610

EXAMPLE (TO ORDER) Pt. No. SH 4086-B = 1/4 Dia. x 1/2 Lg. Hex Standoff-Brass w/6-32 Threaded Hole.

STANDOFF–THREADED ENDS
–HEX & ROUND



Thread	Depth B
0-80	3/16
4-40	1/4
6-32	3/8
8-32	7/16

	A = 1/8 Dia. 0-80 Thread		A = 1/4 Dia. 4-40 Thread		A = 1/4 Dia. 6-32 Thread		A = 1/4 Dia. 8-32 Thread	
Length	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1 1/16	DR 217	DH 217	DR 4174	DH 4174	DR 4176	DH 4176	DR 4178	DH 4178
1 1/8	DR 218	DH 218	DR 4184	DH 4184	DR 4186	DH 4186	DR 4188	DH 4188
1 3/16	DR 219	DH 219	DR 4194	DH 4194	DR 4196	DH 4196	DR 4198	DH 4198
1 1/4	DR 220	DH 220	DR 4204	DH 4204	DR 4206	DH 4206	DR 4208	DH 4208
1 5/16	DR 221	DH 221	DR 4124	DH 4214	DR 4216	DH 4216	DR 4218	DH 4218
1 3/8	DR 222	DH 222	DR 4224	DH 4224	DR 4226	DH 4226	DR 4228	DH 4228
1 7/16	DR 223	DH 223	DR 4234	DH 4234	DR 4236	DH 4236	DR 4238	DH 4238
1 1/2	DR 224	DH 224	DR 4244	DH 4244	DR 4246	DH 4246	DR 4248	DH 4248
2			DR 4324	DH 4324	DR 4326	DH 4326	DR 4328	DH 4328
2 1/8			DR 4344	DH 4344	DR 4346	DH 4346	DR 4348	DH 4348
2 3/4			DR 4444	DH 4444	DR 4446	DH 4446	DR 4448	DH 4448
3			DR 4484	DH 4484	DR 4486	DH 4486	DR 4488	DH 4488

EXAMPLE (TO ORDER) Pt. No. DH 219-B = 1/8 Dia. x 1 3/16 Lg. Hex Standoff-Tapped Both Ends Brass w/o-80 x 3/16 Hole.

	A = 5/16 Dia. 6-32 Thread		A = 3/8 Dia. 6-32 Thread		A = 3/8 Dia. 8-32 Thread		A = 1/2 Dia. 8-32 Thread	
Lgth.	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1 1/16	DR 5176	DH 5176	DR 6176	DH 6176	DR 6178	DH 6178	DR 8178	DH 8178
1 1/8	DR 5186	DH 5186	DR 6186	DH 6186	DR 6188	DH 6188	DR 8188	DH 8188
1 3/16	DR 5196	DH 5196	DR 6196	DH 6196	DR 6198	DH 6198	DR 8198	DH 8198
1 1/4	DR 5206	DH 5206	DR 6206	DH 6206	DR 6208	DH 6208	DR 8208	DH 8208
1 5/16	DR 5216	DH 5216	DR 6216	DH 6216	DR 6218	DH 6218	DR 8218	DH 8218
1 3/8	DR 5226	DH 5226	DR 6226	DH 6226	DR 6228	DH 6228	DR 8228	DH 8228
1 7/16	DR 5236	DH 5236	DR 6236	DH 6236	DR 6238	DH 6238	DR 8238	DH 8238
1 1/2	DR 5246	DH 5246	DR 6246	DH 6246	DR 6248	DH 6248	DR 8248	DH 8248
1 3/4	DR 5286	DH 5286	DR 6286	DH 6286	DR 6288	DH 6288	DR 8288	DH 8288
2	DR 5326	DH 5326	DR 6326	DH 6326	DR 6328	DH 6328	DR 8328	DH 8328
2 1/4	DR 5366	DH 5366	DR 6366	DH 6366	DR 6368	DH 6368	DR 8368	DH 8368
2 1/2	DR 5406	DH 5406	DR 6406	DH 6406	DR 6408	DH 6408	DR 8408	DH 8408
3	DR 5486	DH 5486	DR 6486	DH 6486	DR 6488	DH 6488	DR 8488	DH 8488
3 1/2	DR 5566	DH 5566	DR 6566	DH 6566	DR 6568	DH 6568	DR 8568	DH 8568
4	DR 5646	DH 5646	DR 6646	DH 6646	DR 6648	DH 6648	DR 8648	DH 8648

EXAMPLE (TO ORDER) Pt. No. DR 6186-A = 3/8 Dia. x 1 1/16 Lg. Round Standoff-Aluminum-Tapped Both Ends w/6-32 x 3/8 Thread.

STANDOFF–THREADED

	A = 5/16 Dia.							
	4-40 Thread		6-32 Thread		8-32 Thread		10-32 Thread	
Lgth.	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	SR 5024	SH 5024	SR 5026	SH 5026	SR 5028	SH 5028	SR 50210	SH 50210
3/16	SR 5034	SH 5034	SR 5036	SH 5036	SR 5038	SH 5038	SR 50310	SH 50310
1/4	SR 5044	SH 5044	SR 5046	SH 5046	SR 5048	SH 5048	SR 50410	SH 50410
5/16	SR 5054	SH 5054	SR 5056	SH 5056	SR 5058	SH 5058	SR 50510	SH 50510
3/8	SR 5064	SH 5064	SR 5066	SH 5066	SR 5068	SH 5068	SR 50610	SH 50610
7/16	SR 5074	SH 5074	SR 5076	SH 5076	SR 5078	SH 5078	SR 50710	SH 50710
1/2	SR 5084	SH 5084	SR 5086	SH 5086	SR 5088	SH 5088	SR 50810	SH 50810
9/16	SR 5094	SH 5094	SR 5096	SH 5096	SR 5098	SH 5098	SR 50910	SH 50910
5/8	SR 5104	SH 5104	SR 5106	SH 5106	SR 5108	SH 5108	SR 51010	SH 51010
3/4	SR 5124	SH 5124	SR 5126	SH 5126	SR 5128	SH 5128	SR 51210	SH 51210
7/8	SR 5144	SH 5144	SR 5146	SH 5146	SR 5148	SH 5148	SR 51410	SH 51410
1	SR 5164	SH 5164	SR 5166	SH 5166	SR 5168	SH 5168	SR 51610	SH 51610

EXAMPLE (TO ORDER) Pt. No. SR 5146-PH = 5/16 Dia. x 7/8 Lg. Round Standoff-Phenolic w/6-32 Threaded Hole.

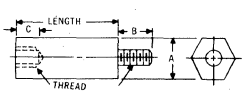
	6-32 Thread		A = 3/8 Dia. 8-32 Thread		10-32 Thread	
Lgth.	Round	Hex	Round	Hex	Round	Hex
1/8	SR 6026	SH 6026	SR 6028	SH 6028	SR 60210	SH 60210
3/16	SR 6036	SH 6036	SR 6038	SH 6038	SR 60310	SH 60310
1/4	SR 6046	SH 6046	SR 6048	SH 6048	SR 60410	SH 60410
5/16	SR 6056	SH 6056	SR 6058	SH 6058	SR 60510	SH 60510
3/8	SR 6066	SH 6066	SR 6068	SH 6068	SR 60610	SH 60610
7/16	SR 6076	SH 6076	SR 6078	SH 6078	SR 60710	SH 60710
1/2	SR 6086	SH 6086	SR 6088	SH 6088	SR 60810	SH 60810
9/16	SR 6096	SH 6096	SR 6098	SH 6098	SR 60910	SH 60910
5/8	SR 6106	SH 6106	SR 6108	SH 6108	SR 61010	SH 61010
3/4	SR 6126	SH 6126	SR 6128	SH 6128	SR 61210	SH 61210
7/8	SR 6146	SH 6146	SR 6148	SH 6148	SR 61410	SH 61410
1	SR 6166	SH 6166	SR 6168	SH 6168	SR 61610	SH 61610

EXAMPLE (TO ORDER) Pt. No. SH 6068-B = 3/8 Dia. x 3/8 Lg. Hex Standoff-Brass w/8-32 Threaded Hole.

	8-32 Thread		A = 1/2 Dia. 10-32 Thread		12-24 Thread		1/4-20 Thread	
Lgth.	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	SR 8028	SH 8028	SR 80210	SH 80210	SR 80212	SH 80212	SR 80214	SH 80214
3/16	SR 8038	SH 8038	SR 80310	SH 80310	SR 80312	SH 80310	SR 80314	SH 80314
1/4	SR 8048	SH 8048	SR 80410	SH 80410	SR 80412	SH 80412	SR 80414	SH 80414
5/16	SR 8058	SH 8058	SR 80510	SH 80510	SR 80512	SH 80512	SR 80514	SH 80514
3/8	SR 8068	SH 8068	SR 80610	SH 80610	SR 80612	SH 80612	SR 80614	SH 80614
7/16	SR 8078	SH 8078	SR 80710	SH 80710	SR 80712	SH 80712	SR 80714	SH 80714
1/2	SR 8088	SH 8088	SR 80810	SH 80810	SR 80812	SH 80812	SR 80814	SH 80814
9/16	SR 8098	SH 8098	SR 80910	SH 80910	SR 80912	SH 80912	SR 80914	SH 80914
5/8	SR 8108	SH 8108	SR 81010	SH 81010	SR 81012	SH 81012	SR 81014	SH 81014
3/4	SR 8128	SH 8128	SR 81210	SH 81210	SR 81212	SH 81212	SR 81214	SH 81214
7/8	SR 8148	SH 8148	SR 81410	SH 81410	SR 81412	SH 81412	SR 81414	SH 81414
1	SR 8168	SH 8168	SR 81610	SH 81610	SR 81612	SH 81612	SR 81616	SH 81614

EXAMPLE (TO ORDER) Pt. No. SR 80910-A = 1/2 Dia. x 9/16 Lg. Round Standoff-Aluminum w/10-32 Threaded Hole.

STANDOFF–MALE-FEMALE



Thread	B	C
4-40	3/16	1/4
6-32	1/4	3/8
8-32	3/8	7/16
10-32	3/8	1/2

	A = 1/4 AC. Fits.				A = 3/8 AC. Fits			
Lgth.	4-40	6-32	8-32	10-32	4-40	6-32	8-32	10-32
1/4	MF 4044	MF 4046	MF 4048	MF 40410	MF 6044	MF 6046	MF 6048	MF 60410
3/8	MF 4064	MF 4066	MF 4068	MF 40610	MF 6064	MF 6066	MF 6068	MF 60610
1/2	MF 4084	MF 4086	MF 4088	MF 40810	MF 6084	MF 6086	MF 6088	MF 60810
5/8	MF 4104	MF 4106	MF 4108	MF 41010	MF 6104	MF 6106	MF 6108	MF 61010
3/4	MF 4124	MF 4126	MF 4128	MF 41210	MF 6124	MF 6126	MF 6128	MF 61210
7/8	MF 4144	MF 4146	MF 4148	MF 41410	MF 6144	MF 6146	MF 6148	MF 61410
1	MF 4164	MF 4166	MF 4168	MF 41610	MF 6164	MF 6166	MF 6168	MF 61610
1 1/8	MF 4184	MF 4186	MF 4188	MF 41810	MF 6184	MF 6186	MF 6188	MF 61810
1 1/4	MF 4204	MF 4206	MF 4208	MF 42010	MF 6204	MF 6206	MF 6208	MF 62010
1 3/8	MF 4224	MF 4226	MF 4228	MF 42210	MF 6224	MF 6226	MF 6228	MF 62210
1 1/2	MF 4244	MF 4246	MF 4248	MF 42410	MF 6244	MF 6246	MF 6248	MF 62410
1 5/8	MF 4264	MF 4266	MF 4268	MF 42610	MF 6264	MF 6266	MF 6268	MF 62610
1 3/4	MF 4284	MF 4286	MF 4288	MF 42810	MF 6284	MF 6286	MF 6288	MF 62810
2	MF 4324	MF 4326	MF 4328	MF 43210	MF 6324	MF 6326	MF 6328	MF 63210
2 1/2	MF 4404	MF 4406	MF 4408	MF 44010	MF 6404	MF 6406	MF 6408	MF 64010
3	MF 4484	MF 4486	MF 4488	MF 44810	MF 6484	MF 6486	MF 6488	MF 64810

EXAMPLE (TO ORDER) Pt. No. MF 4146-B = 1/4 AC Fits. Standoff-Brass 6-32 Male-Female Threads.

SPECIAL SIZES AND MATERIALS MANUFACTURED TO ORDER NOTE: Ceramic and Steatite spacers and standoffs also available.

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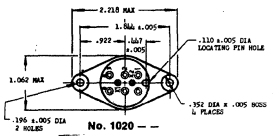
RELAY SOCKETS with Fixed or Removable Contacts!

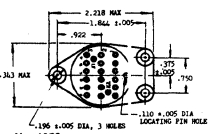
Jan's relay sockets are specifically designed for use with plug-in relays... in electronic circuit applications which demand quick and easy assembly and maintenance.

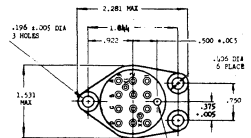
Available with dip-solder pin terminals for printed circuit assembly, or solder cup and turret terminals for direct wiring. For applications requiring removable contacts, solderless wire crimp terminations are available for #16, 20, 22, or 24 AWG wire sizes.

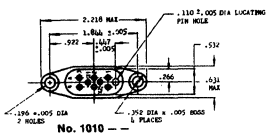
A variety of mounting styles are offered including... tapped inserts with studs for top chassis mounting; thru hole; or tapped inserts with removable standoffs and screws for mounting on either side of chassis or panel. Unexpected disconnect because of vibration is eliminated by fastening the relay to the socket. Polarization dots and/or index holes (optional) aid in plugging in relay correctly. Socket contact material is spring tempered phosphor bronze gold plate over silver plate. Body material is Diallyl Phthalate, fiberglass filled per MIL-M-19833.

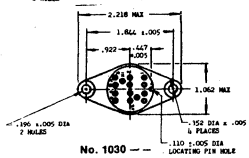
1000 SERIES





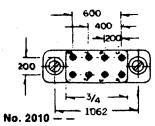


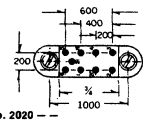


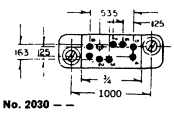


MS No.	JAN Part No.	MS No.	JAN Part No.
MS25322	No. 1010	MS25456	No. 1060
MS25324	No. 1020	MS25458	No. 1070
MS25326	No. 1030	MS25460	No. 1080
MS25328	No. 1040	MS25462	No. 1090
MS25330	No. 1050	MS25464	No. 1100

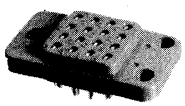
2000 SERIES





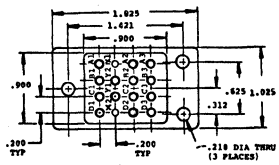


4000 SERIES

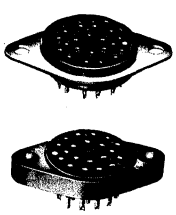


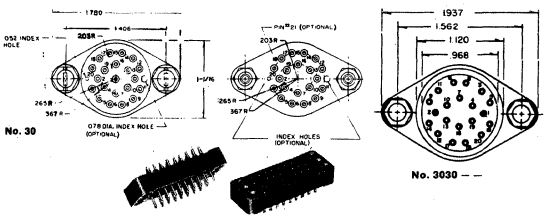
JAN Part No.	Relay Type MS27400
No. 4010	–2
No. 4020	–4
No. 4030	–6
No. 4040	–8

Layout of contacts per MS27400 print. Other layouts can be accommodated.



3000 SERIES





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JAN Part No.			Relay Type
No. 3010	No. 3020	No. 3030	6PDT
No. 3011	No. 3021	No. 3031	6PDTL
No. 3012	No. 3022	No. 3032	4PDT
No. 3013	No. 3023	No. 3033	4PDTL
No. 3014	No. 3024	No. 3044	3PDT
No. 3015	No. 3025	No. 3035	3PDTL

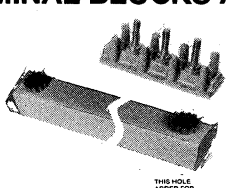
NUMBERING SYSTEM

Typical Part No. 3010

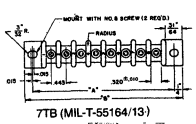
A = Closed Entry
B = Slotted

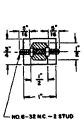
1 = Solder Cup
2 = Eyelet
3 = Turret
4 = Dip Solder
5 = Taper

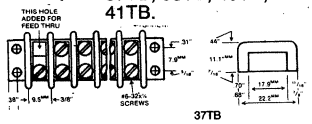
MILITARY TERMINAL BLOCKS AND ACCESSORIES

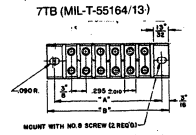


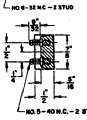
A complete line of Terminal Blocks and accessories, per MS18029, MS25046, MS25123, MS27212, NAS191. MIL-T-55164/13:/14:/23:/24 STYLE 7TB, 8TB, 25TB, 37TB, 38TB, 40TB, 41TB.

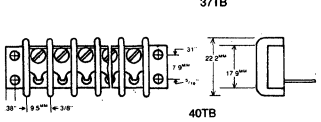






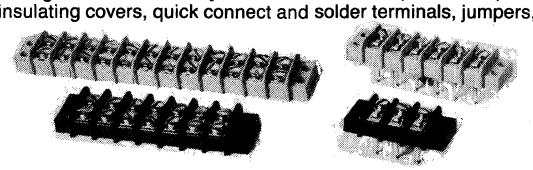






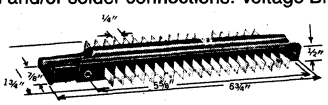
COMMERCIAL TERMINAL BLOCKS

in single or double row styles with accessories (marker strips, insulating covers, quick connect and solder terminals, jumpers, etc.)



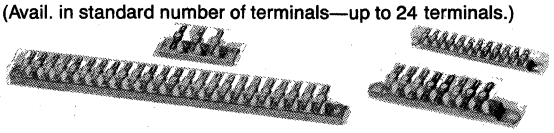
"FEED THROUGH" TERMINAL BOARDS

Cat. No. T-746 Molded of wood-filled melamine per MIL-M-14E. Avoid expensive tooling. Design around this integrally-molded 20 feed-through terminal board. Equally-spaced terminals can be used for wrap around and/or solder connections. Voltage Breakdown 4000 Volts.



MULTI-WAY INSULATING TERMINAL STRIPS

(Avail. in standard number of terminals—up to 24 terminals.)



X-3 INSULATED TERMINALS—PLASTIC

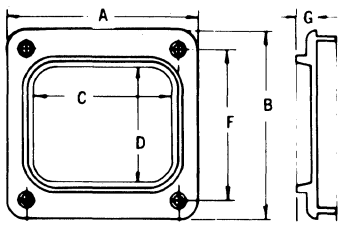
For wire termination in metal and plastic cases (glue to case). Contacts can be brass or brass plated.

Specials Are Our Specialty

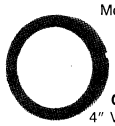
JAN HARDWARE
MANUFACTURING COMPANY INC.

BEZELS
FEATURES

- Engineered for 2", 3", 4", 5", 7", 8", 10" C.R.T.
- Maximum display area
- Precision engraved, scale-calibrated graticules; standard or to customer's specifications
- Materials and finish to "Mil Spec"
- Heavy buna-S shock cushion
- Models for edge-lighting
- Phosphor-matched light filters
- Non-reflecting matte surfaces
- Rugged camera mounts
- Models for curved and flat-faced C.R.T.
- ELBA**



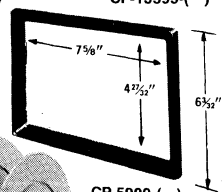
CP-2207-( )
4 9/16" Viewing area x 5 5/16" Dia x 3/4" Deep
Molded plastic



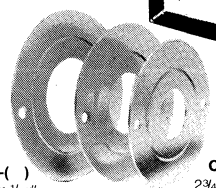
CP-2208-( )
4" Viewing area x 5 1/4" Dia x 3/4" Deep
Molded plastic

CP-1428-( )

CP-13595-( )



CP-5900-( )



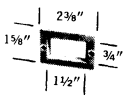
Cat. No.	C.R.T. Face	Material	Type	Dimensions in Inches: Panel Opening	A Overall Width	B Overall Ht.	C D Visible Area (Bezel) Width	C D Visible Area (Bezel) Ht.	E F Mtg. Holes Width	E F Mtg. Holes Ht.	G Thickness (Face Only)	H Thickness (Incl. Flange)	Visible Area (Cushion) Ht.	Visible Area (Cushion) Width
BEZELS FOR 2" C.R.T.														
CP-1110-P-2	Flat	Plastic*	Standard	2 3/16	2 5/8	2 5/8	1 3/4	1 3/4	2	2	5/16	7/16	1 3/4	1 3/4
BEZELS FOR 3" C.R.T.														
CP-1220-P‡	Curved or Flat	Plastic*	Camera Mount	—	4 7/8	3 1/4	2 3/4	2 1/4	4	2 1/2	5/16	11/16"	—	
CP-1328-P-1 CP-1328-P-2	Curved Flat	Plastic*	Standard	3 33/64	3 3/4	3 3/4	2 5/8	2 3/16	3	3	3/8	45/64	2 1/2	2 1/16
CP-1427-1 CP-1427-2	Curved Flat	Aluminum	Camera Mount	3 17/64	4	4	2 3/4 Dia.		3	3	9/16	27/32	2 25/32 Dia.	
CP-1428-1** CP-1428-2**	Curved Flat	Aluminum	Camera Mount E.L.B.A.**	3 17/64	4	4	2 3/4 Dia.		3	3	9/16	27/32	2 25/32 Dia.	
CP-1429-1 CP-1429-2	Curved Flat	Aluminum	Camera Mount	3 17/64	4	4	2 3/4 Dia.		3	3	9/16	27/32	2 25/32 Dia.	
CP-3430-1 CP-3430-2	Curved Flat	Steel	Standard	—	4 1/16 Dia.		3 3/8 Dia.		3 3/4	3 3/4	1 41/64	1 41/64	2 25/32 Dia.	
BEZELS FOR 4" C.R.T.														
CP-1533-P‡	—	Plastic*	Camera Mount	3 1/32	4 39/64	3 61/64	3	3	4	—	1 3/32	1 3/32	No Cushion	
BEZELS FOR 5" C.R.T.														
CP-13549-1 CP-13549-2	Curved Flat	Aluminum	Standard	6.0	6 1/4	6 1/4	4 7/8	3 3/4	4 15/16	4 15/16	17/32	1 3/32	4 1/4	3 3/16
CP-13584-1 CP-13584-2	Curved Flat	Aluminum	Camera Mount	6.0	6 1/4	6 1/4	4 7/8	3 3/4	4 15/16	4 15/16	15/32	1 23/32	4 1/4	3 3/16
CP-13595-1** CP-13595-2**	Curved Flat	Aluminum	Standard E.L.B.A.**	5 7/16	6 1/4	6 1/4	4 7/8	3 3/4	4 15/16	4 15/16	17/32	—	4 3/4 Dia.	
CP-1465 CP-1465-2	Curved or Flat Flat	Steel	Camera Mount	5 9/16 5 17/32	6 3/8 Dia.		5 35/64 Dia.		6	6	7/8	7/8	No Cushion 4 1/2 Dia.	
CP-19495-1** CP-19495-2**	Curved Flat	Aluminum	Camera Mount E.L.B.A.**	5 7/16	6 1/4	6 1/4	5 1/4 Dia.		4 15/16	4 15/16	15/32	—	4 3/4 Dia.	
CP-19636-2**	Flat	Aluminum	Camera Mount E.L.B.A.	5 5/8	5 7/8	5 7/8	4 1/2 Dia.	3	4 7/8	4 7/8	1 1/4	—	4 1/2 Dia.	
CP-446-11 CP-446-22	Flat	Steel	Camera Mount	—	6 9/16 Dia.		5 9/16 Dia.		6 5/32 6 1/8	6 5/32 6 1/8	1	1 19/64 1 3/16	4 1/2 Dia.	
CP-545	Curved or Flat	Aluminum	Camera Mount	5	5 27/32	5 27/32	4 25/32 Dia.		5	5	25/32	—	—	
BEZELS FOR 7" C.R.T.														
CP-7330-1 CP-7331-2**	Curved Flat	Plastic*	Standard E.L.B.A.**	7 13/32	7 13/16	7 13/16	6 5/16 Dia.		6 3/16	6 3/16	3/4	3/4	6 3/8 Dia.	
CP-7375-1** CP-7375-2**	Curved Flat	Aluminum	E.L.B.A.**	7 13/32	8	8	4 1/2	4 1/2	6 3/16	6 3/16	1 17/32	2 29/32	1 1/2	4 1/2
CP-7420-1** CP-7420-2**	Curved or Flat	Plastic*	Camera Mount	7 13/32	7 13/16	7 13/16	6 15/16 Dia.		6 3/16	6 3/16	3/4	1 3/8	6 3/8 Dia.	
CP-7550	Curved or Flat	Aluminum	Camera Mount	4 25/32	7 3/8	6 1/4	4 3/4	4 3/4	6 1/4	5 1/8	1 3/16	1 3/16	No Cushion	
BEZELS FOR 10" C.R.T.														
CP-10860	Curved or Flat	Aluminum	Standard	11 1/32	12 1/4 Dia.		8 1/16	6 1/4	11 1/2 B.O.		1 1/16	1 3/16	No Cushion	

*All Plastic Bezels are furnished in shock resistant plastic, per MIL-P-3414. **Edge Lit Bezel Assemblies ‡Rectangular C.R.T.

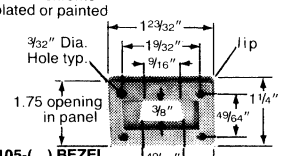
CP-2224-( )
3 1/4" Dia x 1/16" Thick x 1 27/64" Viewing area
Steel chrome plated or painted

CP-2223-( )
3" Dia x 1/16" Thick x 1 9/32" Viewing area
Steel chrome plated or painted

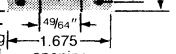
CP-2222-( )
2 3/4" Dia x 1/16" Thick x 1 5/16" Viewing area
Steel chrome plated or painted

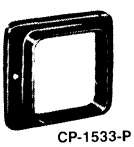


CP-1393-( )

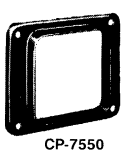


CP-2105-( ) BEZEL
Aluminum casting 3/16" thick overall



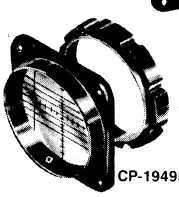


CP-1533-P

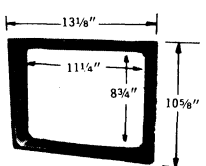


CP-7550

CP13549-

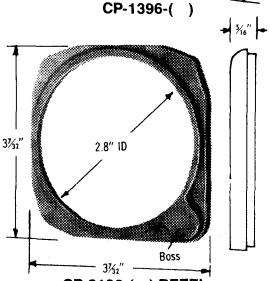


CP-19495



CP-1396-( )

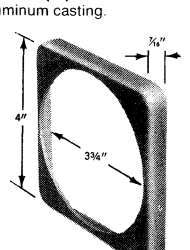
CP-545



CP-2106-( ) BEZEL
Aluminum casting.

CP-2221-( )
3" x 3" Viewing area
3 5/8"H x 3 3/8"W x 1 1/14" Deep
Aluminum-Painted black

CP-7330

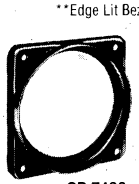


CP-6033-( )
Aluminum, 4 13/64" x 4 13/64" x 7/16" Deep. 3 3/4" Dia. viewing area.

CP-1110P2
(with 4 mounting holes)
CP-1120P2
(same as above, but with 2 mounting holes, in diagonal corners)

CP-1220-P

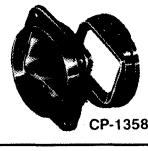
CP-1328-P



CP-7420

CP-725-( )

CP-1465-( )



CP-13584

Specials Are Our Specialty

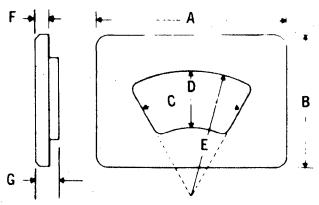
JAN HARDWARE
MANUFACTURING COMPANY INC.

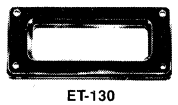
ESCUTCHEON PLATES FOR ELEGANT FRAMING OF PANEL OPENINGS

JAN's molded, black, shock-resistant plastic escutcheons are available in an exceptionally wide variety of different types and sizes. They provide a pleasing window to frame dial plates mounted behind the panel.

Plastic escutcheons are available in the following ways: frame only; frame with clear windows; frame with clear window scribed with a center line.

For especially large working areas, stamped aluminum escutcheons, finished in dull black are available to meet the needs for space economy. Withstands temp. shock – 65°C to + 80°C. NON INFLAMMABLE.




ET-130

ET-135

ET-120

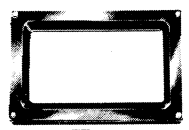
ET125

ET-140

ET-145

ET-150

ET-155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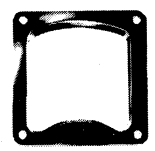
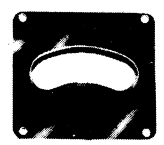
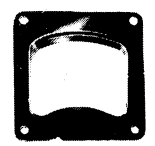
ET-165


EM-310

EM-320


EM-315


EM-325

SPECIFICATIONS — JAN ESCUTCHEONS

Escutcheon Cat. No.	A Overall Width	B Overall Height	C Window Width	D Window Height	E Effective Outer Dial Radius	Thickness F=Face Only	Thickness G=Incl. Flange	Panel Opening Width	Panel Opening Height	Mounting Holes Width	Mounting Holes Height	Type of Dial	Material
ET-120*	2 27/32	1 7/8	1 3/4	1	1 27/32	3/16	3/16	2 11/32	1 3/8	2 9/16 top 2 1/16 bottom	1 9/16		Injection
ET-125*	3 7/8	2 15/16	2 7/8	1	3 1/4	3/16	5/16	3 1/2	1 1/2	3 1/2	1 15/16		Molded
ET-135*	2 3/4	1 7/8	1 1/2	7/8	1 7/8	3/16	1/4	1 31/32	1 7/32	2 1/4	1 3/8	Circular	Tenite II,
ET-150*	3 7/8	2 5/16	2 7/8	3/4	3 1/8	3/16	5/16	3 9/32	1 7/32	3 1/2	1 15/16		Black Matte
ET-165*	2 5/8	1 5/8	1 49/64	9/16	2 3/32	1/8	1/4	2 7/16	1 1/2	2 1/16	1 1/16		Finish
ET-130*	4	1 13/16	2 3/4	1 13/16	—	3/16	1/4	2 13/32	1 11/32	3 1/2	1 5/16	Flexible Tape,	Injection
ET-140*	2 1/2	1 1/2	1 1/4	5/8	—	1/8	5/16	1 17/32	1 1/32	2	1	Digital	Molded
ET-145*	3 1/4	2 1/16	1 15/16	3/4	—	5/32	5/32	2 13/32	1 5/32	2 3/4	1 9/16	Counter,	Tenite II,
ET-155*	2 1/2	1 3/16	1 11/16	1/2	—	5/32		2 1/32	2 9/32	2 1/4	15/16	Cylinder or	Black Matte
ET-160*	3 7/8	2 1/2	2 15/16	1 5/8	—	1/8	1/8	3	2 1/32	3 5/8	2 1/4	Drum	Finish
EM-310	3	3	2 1/16	1 15/16	2 9/16	1/32	1/4	3 11/32	2 1/2	2 1/2	2 1/2	Helical	Soft Aluminum
EM-315	3 1/4	3	2 1/4	5/8	2 1/16	1/32	1/8	2 15/32	1 5/64	2 3/4	2 5/8	Circular	with Black
EM-320	3 1/4	2 3/4	2 1/4	5/8	2 1/16	1/32	1/8	2 29/64	1 3/64	2 3/4	2 1/4	Circular	Matte Enamel
EM-325	3	3	2 1/16	1 1/2	2 5/16	1/32	1/4	2 11/32	1 61/64	2 1/2	2 1/2	Helical	Finish

*To Order Specify: (1) frame only; (2) frame with clear window; (3) frame with clear window scribed with a center line

VIEWING HOODS

Black neoprene rubber, contour-molded, fits the shape of face. Keeps out ambient light when viewing scope.

Cat. No. H-465
Can be used as viewing hood, on 2 3/4" dia. bezels. (#1427; 1428; 1429). Also serves as adapter to permit use of face fitting neoprene rubber viewing hoods. All aluminum. Dull black enamel finish.

Cat. No. H689-1 (5 1/8" I.D.)
Used with following Jan Bezels; 19636; 19495; 13584; 1465.
Cat. No. H-689-2 (4 1/2" I.D.) Used with Jan Bezel #545

Cat. No. H-1008
TO FIT RECTANGULAR BEZELS
Can be adapted for smaller I.D.'s. Can be used with JAN Bezel CP-1328P. Can be adapted for #1533-P).

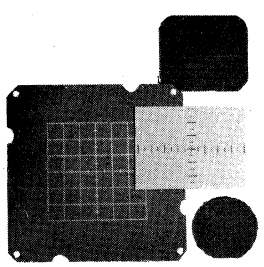
Cat. No. H-1713

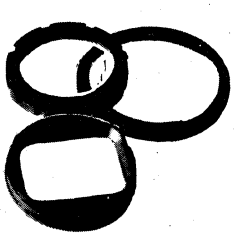
Cat. No. H-1361
(5 25/32" I.D.)

Cat. No. H-1063 (12" I.D.)
Flanges provided for hand access to PPI settings.

GRATICULES/FILTERS CUSHIONS

Assorted Sizes and Shapes





Now! Non-reflective filter material.
Matte 1 side. Grey or Blue.
Other colors on special order.

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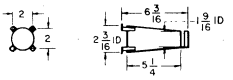
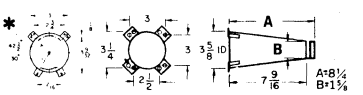
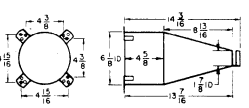
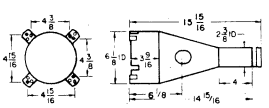
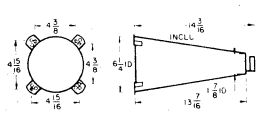
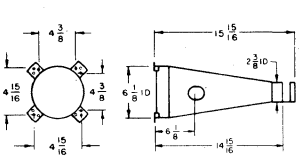
JAN HARDWARE
MANUFACTURING COMPANY INC.

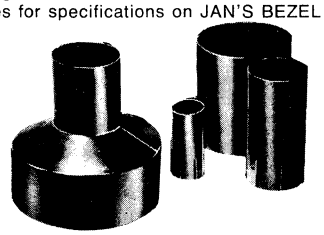
MAGNETIC SHIELDS FOR PHOTO-MULTIPLIER AND SPECIAL PURPOSE TUBES

JAN'S MAGNETIC SHIELDS are made of MU-Metal or equal and are hydrogen annealed by a special process to assure optimum orientation of the molecular structure of the alloy for best magnetic shielding. JAN'S MAGNETIC SHIELDS prevent distortion and intensity modulation of the electron beam due to stray magnetic fields.

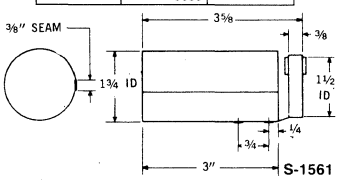
In addition, the use of these shields protect personnel against the dangers of accidental tube breakage. Mounting holes are tapped for No. 6-32 screws as shown. These shields are designed to fit JAN'S standard bezels as listed below. See preceding pages for specifications on JAN'S BEZEL ASSEMBLIES.

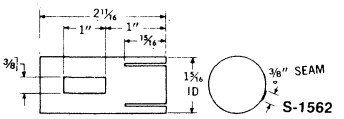
Shield Cat. No.	For Use With C.R.T. No.	Matching Bezel Jan Bezel	
S2001	902 2AP	CP1110P2 CP1120P2	
S2001-1	2BP		
S3001 adaptable for edge-lighting graticule using S3010 with Bezel CP1428*	3RP 3RPA	CP1328-P-1 CP1427-1 CP1429-1 CP1328-P2 CP1427-2 CP1429-2 CP3430-1 CP3430-2	
S003	3KP 908A	CP1328-P1 CP1427-1 CP1429-1	Same type as S-3001, except A=10 1/8 B=2
S3003-1	3AP		
S3004 — 12 (less anode hole) — 22 (with anode hole) adaptable for edge-lighting graticule using S3012 with Bezel CP1428*	3BP 3JP 3ACP	Same as S3003 Same as S3005	Same type as S-3001, except A=8 5/8 B=2 3/8
S3005 adaptable for edge-lighting graticule using S3008 with Bezel CP1428*	3WP	CP1328-P2 CP1427-2 CP1429-2	Same type as S-3001, except A=10 5/8 B=17/8
S3016	3ASP		Contact factory for specifications of these shields
S3019	3XP	CP-725	
S3031	3BFP		
S3027	4KP 4ER	CP1533P	
S4001	SC3511 4MP	CP1533P	
S5001	5UP	CP1465 CP13584-1 CP13549-1 CP13595-1 CP19495-1 CP446-11 CP446-22	
S5002 adaptable for edge-lighting	5BP 5CP 5ABP 5ADP	Same as S5001 Same as S5006	
S5003	5UP	CP1465 CP13584-1 CP13549-1 CP13595-1 CP19495-1	
S5005 adaptable for edge-lighting	5AQP 5ABP 5ADP	CP1465-2 CP13549-2 CP13584-2 CP13595-2 CP19495-2 CP446-11 CP446-22	
S5006 adaptable for edge-lighting	5RPA 5AWP	CP1465-2 CP13549-2 CP13584-2 CP13595-2 CP19495-2	Contact factory for specifications of these shields

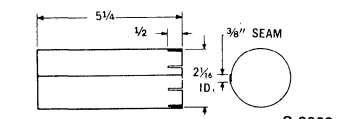
Shielding for EMC, RF1, and EMI now available, as bezels, shields, cushions, gaskets...in strip, sheet, formed and molded.

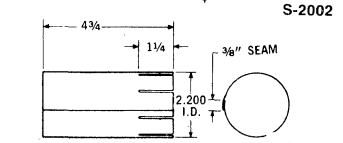


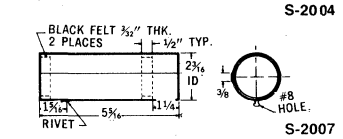
Shield	Tube	Shield	Tube	Shield	Tube
S-1091	ICP1		IP21	S-2005	6372
	929	S-1562	IP22	S-2007	7850
	930		IP28	S-2008	4459
S-1181	5581	S-1563	1EP1		6217
	5653		2002	S-3015	1197
	IP39		6810		6363
	IP40	S-2002	7264	S-5013	1112
S-1500	6291		7265	S-5018	1198
	4440		7326		6364
S-1561	6199	S-2003	6903	S-7009	1238
	7102		2020		1287
	931		4463		
	4471		5819		
	4472		6292		
S-1562	4473	S-2004	6342		
	6323		6571		
	6328		6655		
	7117		7746		
			8053		

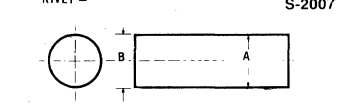












Available in These Seamless Tubing Dimensions ▶
Can be supplied cut to your length, with holes and/or cutouts to your specifications.

A	B
1.010	1.050
.948	.998
.740	.783
.632	.663

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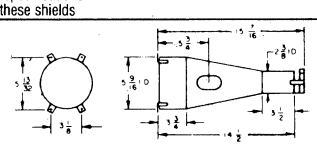
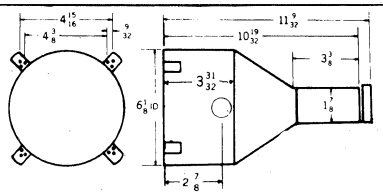
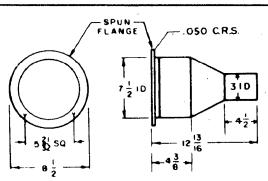
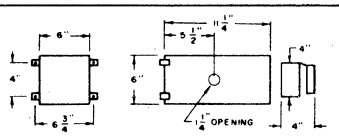
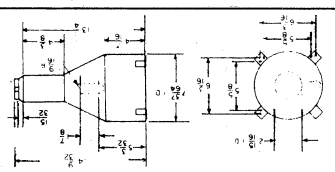
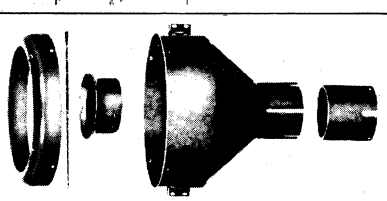
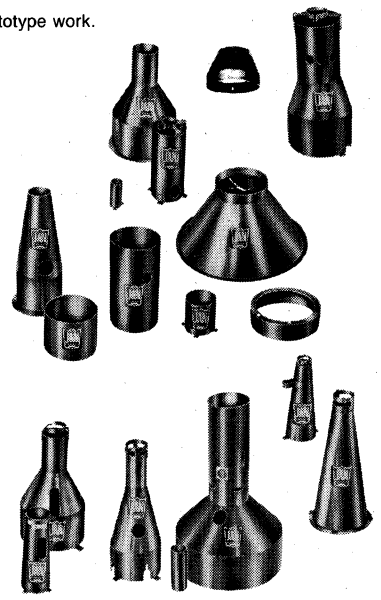
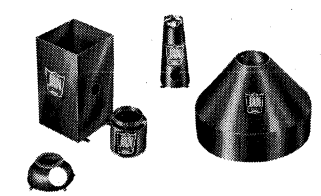
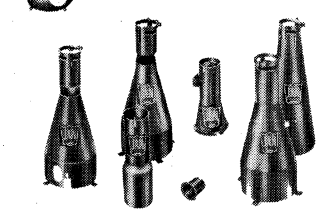
MAGNETIC SHIELDS FOR PHOTO MULTIPLIERS & SPECIAL PURPOSE TUBES

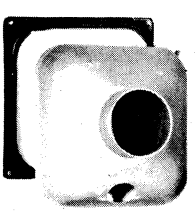
When ordering, be sure to specify CRT type number. Anode openings provided, where required.
We will design and manufacture SPECIAL Shields & Bezels, to customers specifications. Complete facilities for prototype work.

Shield Cat. No.	For Use With C.R.T. No.	Matching Jan Bezel	
S5008 adaptable for edge-lighting	5AMP	CP1465-2 CP13549-2 CP13584-2 CP13595-2 CP19495-2	Contact factory for specifications of these shields
S5017 adaptable for edge-lighting	5ABP 5APD	CP1465-2 CP19636-2	
S5027	5BTP	CP19495-2	
S5032	5CEP	CP19495-2	Contact factory for specifications of these shields
S5500	5BXP		
S6600	6E17P		
S7001	7GP 7JP 7VP	CP7330 CP7445 CP7331 CP7550 CP7420	
S7003 (Shield supplied as two separate sections)	7YP3	CP-7550	
S7006	7ALP	CP7330 CP7445 CP7331 CP7550 CP7420	
S10002	10KP 10WP		

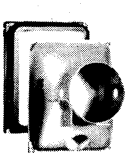








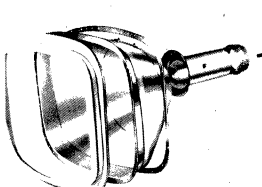
VIEWING AREA
6" high x 6" wide



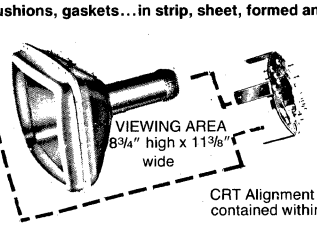
VIEWING AREA
3" high x 4" wide

VIEWING AREA
2½" high x 2½" wide

Shielding for EMC, RF1, and EMI now available, as bezels, shields, cushions, gaskets...in strip, sheet, formed and molded.



VIEWING AREA
11⅜" high x 14½" wide



VIEWING AREA
8¾" high x 11⅜" wide

CRT Alignment Board contained within neck

JAN HARDWARE • 47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: 718-361-0800 • FAX: 718-784-0796

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

WE CATALOGUE & MANUFACTURE MORE THAN 10,000 DIFFERENT KNOBS FOR COMMERCIAL, INDUSTRIAL, MILITARY AND OTHER GOV'T AGENCIES. (FSN, MS, SM, SC, ON, NAS, AN, ETC.) WE INVITE YOUR INQUIRIES.

Standard Shaft Holes-1/16" Increments.

-(2)–1/8" -(B)–1/8" D Flatted -(BB)–1/8" Double Flatted
-(2.5)-5/32" -(B.5)-5/32" D Flatted -(BB.5)–5/32" Double Flatted
-(4)–1/4" -(C)–3/16" D Flatted -(CC)–5/16" Double Flatted
-(D)–1/4" D Flatted -(DD)–1/4" Double Flatted
-(D1)–5/16" D Flatted (DD1.3)–21/64" Double Flatted
-(EE)–11/64" Double Flatted

Nominal shaft dimensions: 1/8" = .128 1/4" = .253

Finish: M-Matte; G-Glossy; **/WD**-White Dot, **/WL**-White Line Colors: A-Black; B-Red; C-Grey. (See pages **C**•1610–**C**•1611 for other information.)

Typical Part No. K1697-(4)MA (1/4" shaft, Matte Finish, Black)

SLIP-CLUTCH KNOB with Spinners

KS-1375-(4) & KS-1376-(4)

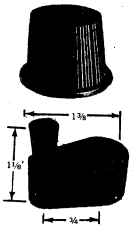
For driving devices such as variable capacitors, inductors, potentiometers, etc., the "slip-clutch"* automatically disengages and slips when predetermined torque has been exceeded. Knobs are fluted, and equipped with either fixed or retractable spinner for fast turning. Backlash-free units safeguard against cranking beyond normal stops.

*Normally set for 3-6" lbs./in. Can be modified for other requirements.

Model K-1376-(4) is identical with K-1375 with additional feature retractable spinner. Spring loading provides positive, toggle-type action to lock spinner in open or closed position. K-1376 for use where economy of space is essential.

Cat. Nos. K-1275-(4) & 1276-(4)

In appearance, these knobs are identical with K-1375 and K-1376 but without Slip-Clutch. Molded Bakelite-to-metal-insert-construction, two set screws for attachment to shafts.

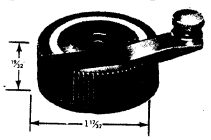


K1357-(4)SLIP CLUTCH KNOB
Knurl aluminum. Twin set screws. 1 3/8" dia. skirt, tapers to 1" at top. Height, 1" Std. torque 1 to 3 lbs./in. Avail. from 1/2 oz./in. to 48 oz./in.
For additional slip clutch knobs see JANSET KNOBS.

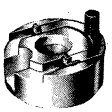
K-1125-(4)
SPINNER KNOB

SK-1125-(4)
SKIP CLUTCH KNOB

RETRACTABLE SPINNER CRANK KNOB



MS-91522-1-(DD)
Aluminum Olive Drab. Other colors and shaft dia. on request. 2 5/8" min. clearance required with handle in open position.



K1622
Modified version to replace MS91522. Incorporates brake mechansim to lock control in position.

MINIATURE SPINNER KNOB

K1358-(2)
Nylon. 19/32" H. x 3/4" W. Spinner section dia. 3/8". Accepts 1/8" shaft or smaller.

K2131-(4)
1.3" H. x 1 5/8" dia. 1 1/8" (2 set screws).

K2170-(6)
27/32" H. x 27/8" Dia. (For 3/8" shaft) Mounts by screw through top of knob into threaded end of shaft.

CAST ALUMINUM BAR KNOBS

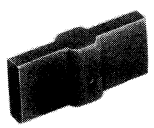
K1325
K1327
K1342
K1487
K1490
K1994
K1996
K2029

K1325-(4)
1" level arm for heavy load switching. 9/16" H. x 11 7/32" L. x 9/16" body dia.

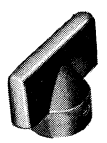
K1490-(2.5)
43/64" H. x 1 1/4" L. x 1/16" hub. Can supply for mounting skirt.

K1994-(2.5)
25/32"H. x 1" long. 13/32" body dia. 7/32" Hub. dia.

K1996-(4)
5/8" H. x 1 13/64" L. 21/32" body dia. Single set screw.



K2029-(4)
13/16" H. x 1/2" dia. x 1 13/16" L. One set screw. Hole for pinning.



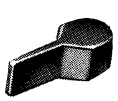
K1327-(4)
1" H. x 1 1/16" body dia.

K1487-(DD)
Mounts from top. 35/64" H. x 1 3/16" L. x 27/32" dia.

K1342-(DD)
Knob switch. 7/16" x 1 1/2" L. 1" body dia., 7/16" bar dia.

K981
K1337
K1408
K1429
K1431
K1695
MS91523-1
K2123

MS91523-(DD)
1/2" H. x 1 7/32" L. Center of shaft hole to end of handle-29/32".



K1337-(4)
3/8" H. x 1 1/8" L. x 1/2" body dia.

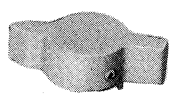
K1408-(D.5)
1 13/16" H. x 1 29/32" L.

K1695 .255 square shaft. 1/2" H. x 1 3/4" L. Center of shaft hole to end of handle—1 3/8".

K1429-(4)
15/32" H. x 27/32" L. Magnesium Casting. 1 set screw and pinning hole.

K1431-(3.5)
1/2" H. x 1 1/2" L. Body dia. 9/16" Normally supplied for pinning to shaft. Can be supplied for screw attachment. Can also be supplied in brass.

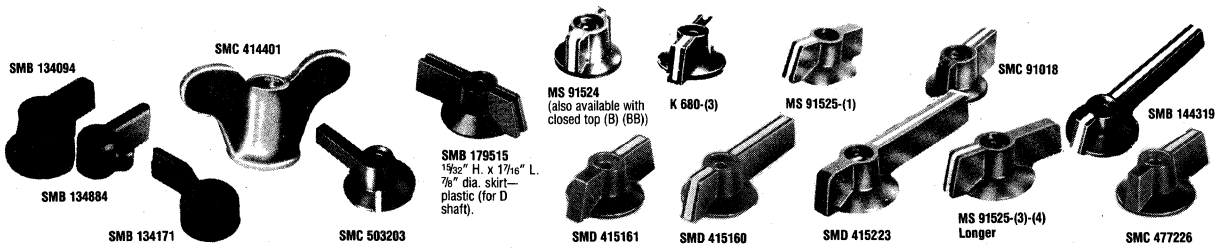
K2123-(4)
5/8" H. x 1 3/4" L. 1 1/16" body dia. Brass casting.



K981-(4)
3/16" H. x 2 1/32" L. 1 1/16" body dia.

MS & SIGNAL CORPS ALUMINUM & PLASTIC CONTROL KNOBS

K680
SMC91018
MS91524
SM91525
SMB134094
SMB134171
SMB134884
SMB179515
SMB144319
SMC414401
SMC447226
SMD415160
SMD415161
SMD415223
SMC503203



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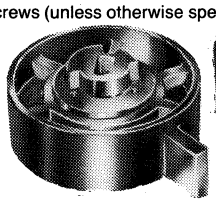
MANUFACTURING COMPANY INC.

MOLDED PLASTIC KNOBS W/O METAL INSERTS

2 Set Screws (unless otherwise specified)

K1440 K1445 K1575 K1794 K1942 K2108 K2127 AN3220



AN3220-1-(4) 7/8" H. 27/32" dia. 1 1/2" L.

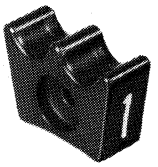
AN3220-3-(D) 7/8" H. x 27/32" dia. 1 1/2" L. 1 set screw.

K1445-(4) 1" H. x 7/8" dia., one set screw.

K2108-DDGA 31/64" H. x 1 3/8" OD. (Double flatted shaft hole.) .258 x .209 No screws, mounts to end of female threaded shaft.

K2127-(3.4) 13/32" H. x 1 13/32" dia. For 13/64" dia. shaft. (Mounts from top into end of shaft).

K1440 7/8" H. x 1 3/4" dia. Special mounting. Adaptable for other mounting.



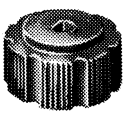
K1942 flatted shaft. 41/64" W. x 3/16" thick. Mounts with clearance hole 11/64" dia. thru 39/64" thickness. Thick; 133/64" L. x 17/64" H. Note: Add dash & number required to be at end of knob.

K1257 K1335 K1407 K1791 K1939 K1940 K1954 K2004 K2006 K2034 K2132 K2213

K1257-(1.75) 15/16" H. x 7/16" W. Hole for pinning to shaft.

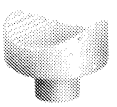
K1939. .260 dia. shaft. no screws, must be pinned to shaft; 1 1/16"; 35/64" H.

K1940-(3.25) no screws—must be pinned to shaft; 1 1/64" OD.; 5/8" H.



K1335-(B.5) 11/32" H. x 21/32" dia. No screw holes.

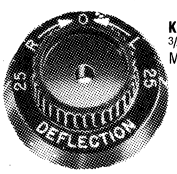
K2132 3/4" H. x 15/16" dia. mode. For .380 x .80 flat shaft. (Supplied in 2 halves).



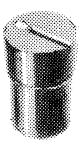
K1954-(1.5) 63/64" OD.; 11/16" H. Allows turning with one finger or conventional.

K2004-(4) 3/8" H. x 1 1/8" L. x 5/16" body dia. (Avail. in Cast Alum. See K2002.)

K2034 Push Button. For 3/64" x 3/16" flat shaft, 3/8" L. 15/32" H. x 29/64" dia. Mounts by pushing onto shaft with flat spring in shaft hole. No screws.



K1791 (3.5) 3/4" H. x 1 23/32" dia. Mounts from top.



K1407-1(B) 9/16" H. x 23/64" O.D. shaft hole dia. .083 with .048 flat. Screwdriver slot on top.

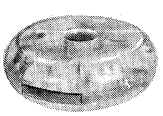
K1407-2(B) 1/2" H. With or w/o white dot.

K2006-(B) 1/2" H. x 11/32" dia. with 3/64" indicator tip. No screws. Screwdriver slot on top.

K2213 3/4" H. x 2 1/4" Long x 1 1/8" Wide (Yellow with black stripes) Special mounting - no set screws.

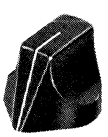
K1717 K1795 K1948 K2005 K2093 K2094 K2104 K2129 K2216 SMC447976 SMC447306

K1795-(DD) 1 3/16" L. x 15/32" H. 7/8" skirt dia. Black w/ white fill. Mounts from top.



K2129-(4) 3/4" H. x 21/32" L. 15/16" dia. (Body dia 1").

K2104-(4) 7/8" H. x 1 3/4" dia.



K2094-(D) 3/4" H. x 1 1/16" dia. No screw-push on type with flat spring.

K2093-(DD) 7/16" H. x 1 1/8" L. Mounts from top.

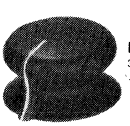
SMC447976 (1)-(2)

SMC447306

K1948-(4) 1 1/4" dia.; 1 11/16" L. with .109 slot in one wall

K1717 15/32" H. 1/2" O.D.; ID .140 can be 8-32 thread.

K2005-(8) 17/32" H. x 3/4" dia. (Two 5/32" dia. holes on top thru to 1/2" dia.)



K2216-DMC/WL 3/4" H. x 1 1/2 dia. 1 Set Screw

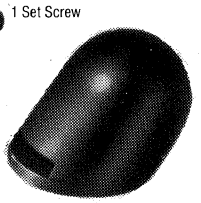
NAS120 NAS121 NAS123 NAS124 NAS125 NAS168

NAS120-(2)(1.5) For flat shafts. 3/4" spherical dia. 1 screw.

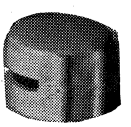
NAS 121-(3)(2)(1.5) For flat shafts. 1" spherical dia. 1 screw.

NAS123-(2)(1.5) For flat shafts. 1" dia. 5/8" oval. 1 screw.

NAS124-(3)(2)(1.5) For flat shafts. 13/16" H. x 1 1/4" dia. 1 screw.

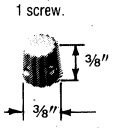


NAS125-(3)(2)(1.5) For flat shafts. 1 1/8" x 1 3/16" semi-round. 1 screw.

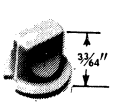


NAS168-(3)(2)(1.5) For flat shafts. 13/16" H. x 1" dia. 1 screw

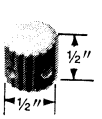
K101294 K101295 K101297 K2187 K2191



K101297

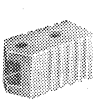


K101294( ) (-1) 11/16" Skirt dia. (-2) 3/4" Skirt dia.



K-101295-(B) Add/WD if with white dot

K2187-(3) or (4) 21/32" H. x 1/2" Dia. Mounts with screw into threaded end of shaft or set screw holes can be accomplished.



K2191-EE 5/8" Long x 5/16" x 5/16" Square Dia.— 2 holes for pinning to shaft. Frosted finish.

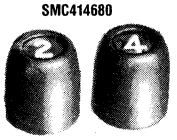
SIGNAL CORPS DIE CAST KNOBS

K242 K984 SCB35862-1 SMC414393 SMC414399 SMC414680 100446

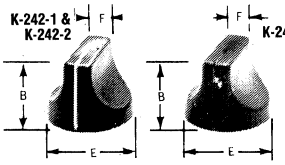
SMC414399

K-984 Dimensions as per 242-3 No markings. .25/ tear drop shaft hole.

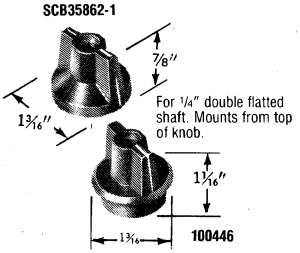
SMC 414393 1/2" H. x 11/16" O.D. Mounts with screw (not supplied) from top.



SMC414680



Cat. No.	B	E	F	Marking
K-242-1	3/4"	15/16"	5/16"	White
K-242-2	7/8"	1 1/8"	3/8"	White
K-242-3	3/4"	15/16"	5/16"	None



Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

TRANSILLUMINATED (BACK-LIT) MOLDED PLASTIC KNOBS WITH METAL INSERTS

2 Set Screws (unless otherwise specified).

Precision molded of JAN's transparent plastic material to military specs, with dull finish. Transilluminated pointers permit easy reading under subdued lighting conditions. For use on instrument panels, switchboards, electrical and electronic apparatus.

Can be supplied without transillumination, for other size shafts, and in other colors.

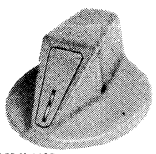
OTHER SPECIAL VARIATIONS AVAILABLE

Standard Shaft Holes—1/16″ increments

-(2)—1/8″ -(B)—1/8″ D Flatted -(BB)—1/8″ Double Flatted
-(2.5)—5/32″ -(B.5)—5/32″ D Flatted -(BB.5)—5/32″ Double Flatted
-(4)—1/4″ -(C)—3/16″ D Flatted -(CC)—5/16″ Double Flatted
-(D)—1/4″ D Flatted -(DD)—1/4″ Double Flatted
-(D1)—5/16″ D Flatted -(DD1.3)—21/64″ Double Flatted
-(EE)—11/64″ Double Flatted

Nominal shaft dimensions: 1/8″ = .128 1/4″ = .253
Finish: M-Matte; G-Glossy; /WD-White Dot, /WL-White Line
Colors: A-Black; B-Red; C-Grey.
Typical Part No. K1697-(4)MA (1/4″ shaft, Matte Finish, Black)

K977
K1103
K1724-(2)
K1199
K1788
K1999
MS24229-P1
MS25165-1
MS25166-1



LM-K 1199
USED ON LUNAR MODULES!
Precision aluminum casting. Adaptable for back lighting. With slip clutch features similar to K1375.

K1999-(D) 7/8″ H. x 137/64″ dia

K1103-(D) 13/16″ H. x 15/8″ dia. One set screw.

K1724-(2) 49/64″ H. x 63/64″ dia.

MS25165-1-(D) 23/32″ H. x 1 1/4″ dia.

MS25166-1-(D) 27/32″ H., 1 1/2″ dia. skirt. One set screw.

MS24229-P1-(D) 27/32″ H. x 1 1/2″ OD. One set screw.

K1788-(D) 7/8″ H. x 123/32″ L. Skirt dia. 13/8″. One set screw.

USAF 61D 404 74
K-977-(D)
1 1/8″ H. x 1 1/4″ dia. Single set screw.

NAS 539
K1338
K1339
K1501
K1502
K1503
K1504
K1800
K2041
K2182-(D)

K1338-(D) 25/32″ H. x 1 1/2″ dia. One set screw.

K1339-(4) 3/4″ H. x 1 1/2″ dia.

K2041-(4.4)(D) 7/8″ H. x 15/32″ dia. Transilluminated (No insert)

K2182-(D) 7/8″ H. x 1 1/2″ dia. x 25/32″ wide body x 143/64″ long.

NAS 539-1B-(D) 1 set screw.
NAS 539-1C-(4) 2 set screws. 51/64″ H. x 1 1/4″ dia.

K1501-(B) 9/16″ H. x 7/8″ dia.

K1504-(B) 5/8″ H. x 1″ OD.

K1800-(D) 59/64″ H. x 1 1/2″ dia. One set screw.

K1502-(B) 23/32″ H. x 15/32″ L.

K1503-(B) 1″ dia, 3/4″ H. x 1 1/8″ L.

K1428
K1430
K1435
K1500
K1951
K1992
K2031
K2128
MS25169
MS25170-P2
MS25170-P1

K1428-(2)(4) 5/8″ H. x 3/4″ dia. Avail. w/backlit indicator line or dot.

K2031-(2) 3/4″ H. x 9/16″ OD.

K1992-(4) 3/4″ H. x 1 1/16″ dia.

K1500-(2)(B) 5/8″ H. x 3/4″ dia.

K2128-(4) 7/8″ H. x 7/8″ dia.

K1430-(2)(4) 5/8″ H. x 3/4″ dia. One set screw.

K1435-(4) 7/8″ x 1 3/32″ dia. One set screw.

K1951-(5.25) 51/64″ H. x 1″ dia. 3 set screws. Metal insert extends above plastic body.

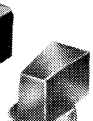
MS25169-P1B 11/16″ H. knob body .875″ dia. One set screw. Also avail. w/skirt.

MS25170-P1B 27/32″ H. x 7/8″ dia. One set screw.

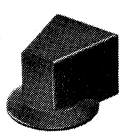
MS25170-P2A 27/32″ H. Skirt dia. 1 1/2″; knob body .875 dia. One set screw.

K1710
K1711
K1712
K1797
K1943
K2028
K2101
K2102
MS21382
MS21384
K21385

K1710-(D) One set screw. 51/64″ dia. x 29/32″ H. 1 1/2″ L. x 45/64″ wide bar.
K1711 1″ dia. x 45/64″ H. 1″L. x 19/32″ wide bar.
K1712 1″ dia. x 29/32″ H. 1″L. x 19/32″ wide bar.



1797-(4) 13/16″ H. x 15/16″ L. Skirt dia. 1 1/8″.



K1943-(4) 1 1/8″ skirt OD. 3/16″ H. x 1 17/32″ L.

K2028-(2) 7/8″ H. x 1″ dia.

K21385-4MC/5/BLWL 3/4″ H. x 7/8″ dia.

MS21382-(2)(B) 7/16″ H. x 1/2″ OD.

K2101-(4) 7/8″ H. x 7/8″ dia.

MS21384 Type 1 5/8″ H. x 1″ OD.

K2102-(D) 15/64″ H. x 211/16″ dia. Single set screw.

MS21384 Type 2 5/8″ H. x 1″ dia.

MS21384 Type 3 11/16″ H. 1″ Skirt dia.

MS21384 Type 4 1 1/8″ L. 3/4″ H. x 1″ OD.

MS21385
MS21386

MS21385 Type 1 3/4″ H. x 7/8″ OD.

MS21385 Type 2 3/4″ H. x 7/8″ dia.

MS21385 Type 3 3/4″ x 7/8″ OD.

MS21385 Type 4 3/4″ H. x 7/8″ dia.

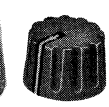
MS21385 Type 5 3/4″ H. x 7/8″ dia.

MS21385 Type 6 3/4″ H. x 7/8″ dia.

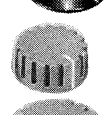
MS21385 Type 7 3/4″ H x 7/8″ OD.

MS21385 Type 8 3/4″ H. x 7/8″ dia.

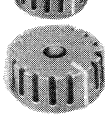
MS21385 Type 9 3/4″ H. x 7/8″ dia.



MS21385 Type 10 3/4″ H. x 1 1/8″ dia.



MS21386 Type 1 (B) 11/32″ H. x 3/4″ dia.



MS21386 Type 2 (D) 11/32″ H. x 1″ dia. Shaft hole is for concentric mounting.

K1456
K1486
K2003
K2013
K2038
K2039
K2171-(2), (B)
K2175-(4)
MS21387
MS91528

MS21387 5/8″ H. x 3/4″ OD.

K2039-(B) 9/16″ H. x 5/8″ dia.

K2038-(B) 7/16″ H. x 1/2″ dia.

K1582-(2) 9/16″ H. x 31/64″ dia.

K2013-(4) 19/32″ H. x 2 1/16″ dia.

K2171-(2) or (B) 7/16″ H. x 1/2″ dia. Note: 2 screws with round hole, 1 screw with flatted hole—unless 2 are requested.

K2175-(4) 13/16″ H. x 1 1/8″ dia. x 1 5/16″ overall length. One set screw.

MS91528 See page C•1631 and C•1632 for specifications.

K1486-(4) Alum. w/backlit skirt. Knob 53/64″ H. x 3/4″ x 7/16″. 1 1/4″ dia. skirt. Also avail. w/o skirt.

K2003-(4) 13/16″ H. x 1 1/8″ dia. One set screw.

K1456-(D.5) 1/2″ H. x 119/32″ dia. Backlit numbers.

K1577
K1786
K1787
K2008
K2013
MS25167
MS25168

K1577-(D) One set screw. 7/8″ H. x 3/4″ dia. Skirt dia. 1 1/4″. Avail. with other markings and/or less skirt.

MS25167-P1B 23/32″ H. x 5/8″ dia. One set screw.

MS25168-P1B 27/32″ H. x 1″ dia. One set screw.

MS25167-P2B 23/32″ H. x 5/8″ dia. Skirt dia. 1 1/4″. One set screw. Also avail. w/o skirt.

MS25168-P2B 27/32″ H. x 1″ dia. Skirt dia. 1 1/8″. One set screw.

K2008-(4) 3/4″ H. x 1 3/4″ dia.

K1786-(B) 55/64″ H. x 9/16″ body dia., 1″ skirt dia. One set screw.
K1787 Same as 1786 except 41/64″ H.

K2013-(4) 39/64″ H. x 2″ dia. Back lit marking as required.

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

MOLDED PLASTIC KNOBS WITH METAL INSERTS 2 Set Screws (unless otherwise specified).

Standard Shaft Holes—1/16″ increments.

-(2)—1/8″ -(B)—1/8″ D Flatted -(BB)—1/8″ Double Flatted
-(2.5)-5/32″ -(B-5)-5/32″ D Flatted -(BB.5)—5/32″ Double Flatted
-(4)—1/4″ -(C)—3/16″ D Flatted -(CC)—5/16″ Double Flatted
-(D)—1/4″ D Flatted -(DD)—1/4″ Double Flatted
-(D1)—5/16″ D Flatted -(DD1.3)—21/64″ Double Flatted
-(EE)—11/64″ Double Flatted

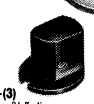
Nominal shaft dimensions: 1/8″ = .128 1/4″ = .253

Finish: M-Matte; G-Glossy; **/WD** = White Dot, **/WL** = White Line
Colors: A-Black; B-Red; C-Grey.

Typical Part No. K1697-(4)MA
(1/4″ shaft, Matte Finish, Black)

K783 K1332 K1333 K1494 K1706 K1707 K1708 K1709 K1803 K1804 K2000 K2209 M3926

K2000-(2) 11/16″ H. x 1″ dia.



K1332-(3) 21/32″ H. x 11/8″ dia. Notch: 1/8″ W. x 33/16″ D.

K1333-(3) 5/8″ H. x 3/4″ dia.

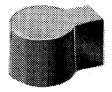
K1706-(D) 11/2″ O.D. x 7/8″ H. Single set screw
K1707 2″ O.D. x 7/8″ H.

K1708-(D) 3/4″ H. x 3/4″ wide bar. 11/2″ O.D. skirt.
K1709-(D) 7/8″ H. x 3/4″ wide bar. 2″ dia. skirt

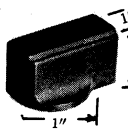
K2209-DMA 15/16″ H. x 113/16″ Dia 1 Set Screw

K1803-(4) 3/4″ H. x 13/16″ dia. Skirt can have white line or notch.

K1494-(4) 11/16″ H. x 11/8″ dia. x 11/4″ length.



K1804-(D) 5/8″ H. x 3/4″ dia. 11/16″ long. Can be supplied with skirt.



BAR KNOB
K-783 Set screw at back, for shaft attachment. Finished to specifications.

M3926/3
1″ H. x 1″ O.D. with 9/16″ dia. hub. Also avail. to accommodate 8-32 and 1/4-28 threaded shafts.

K1471 K1472 K1573 K1629 K1785 K1953 K2037 K2040 K3219

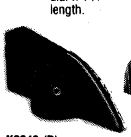
K1471-(4) 3/4″ H. x 25/16″ L. x 3/4″ W. Center of shaft hole to pointer end, 48/64″.
Black or Grey. Can be supplied for other round and "D" flat shafts

K1472-(4) 21/32″ H. x 115/32″ L. x 3/4″ W Center of shaft hole to pointed end, 37/64″

AN3219-1-(4) 5/8″ H. x 3/4″ dia. x 11/4″ L. 1 set screw.

K2037-(D) 3/4″ H. x 27/32″ dia. 11/2″ L.

K1573-(D) 3/4″ H. x 115/32″ L. x 13/16″ body dia.



K2040-(D) 3/4″ H. x 7/8″ dia. x 21/4″ L.

K1629-(4) 21/4″ overall length x 7/8″ overall width. Shaft hole centered.

K1785-(2)(4) 1/2″ H., 11/2″ W., x 1/2″ dia.

K1953-(4) 2 set screws, or for female or male threaded stud 23/64″ H. x 11/8″ OD.

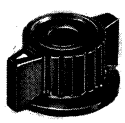
K706 K772 K1468 K1481 K1492 K2011 K2014 K2015 K2024 K2035 K2088 K2100 K2219

K706-(DD) (mounts from top of knob). No insert. 1″ H. x 5/8″ W. x 13/8″ L.

K2035-(4) 11/16″ H. x 7/8″ D. x 11/4″ L.

K1492-(4) 11/16″ H. x 1″ L. Single set screw.

K772-(4) 13/8″ OD.; 3/4″ H. (not including non-rotation pin). Avail. in black, red, yellow, green, & blue. To order add color to part no.



K2011-(4) 3/4″ H. x 13/8″ dia. Overall length 15/8″.

K2215-4GA 1/2″ H. x 15/16″ dia (Can be supplied with white line on bar)

K2024-(6) 11/4″ H. x 111/32″ dia. 21/4″ overall length.

K1481-(2)(4) "Pull" Knob 20/64″ H. x 23/32″ dia. x 27/32″. Note: Basic configuration of knob is MS91528-1GG.

K2015-(4) 11/16″ H. x 3/4″ OD. Overall length 11/8″.

K2014-(4) 1″ H. x 45/64″ OD. Overall length 29/32″.

K1468-(4) 27/32″ H. x 111/16″ dia. Single set screw.

K2088-(4) 3/4″ H. x 11/16″ dia. Single set screw.

K2100-(2) 3/16″ H. x 5/8″ dia.

K2219-4GA/WA 1″ H. x 11/32″ Dia

K1280 K1345 K1351 K1353 K1355 K1805 K1700 K1718 K1772 K1793

K1718-(B) 21/32″ H. x 9/16″ O.D. Can supply for 1/4″ shaft on special order.

K1772-(2) 9/16″ H. x 11/16″ L.

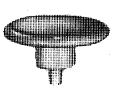
K1351-(2) .096 across flat. 9/16″ H. x 5/8″ dia.

K1355-(3) 5/8″ H. Base size 17/32″ x 13/32″.

K1345-(3) 3/4″ W. x 7/16″ dia. (Shaft mounts in side hole, screw at bottom). Single set screw

K1280-(3.25) 5/16″ H. x 7/8″ L. x 11/16″ W.

K1353 5/16-32 threaded shaft. 59/64″ H. x 1/2″ dia.



K1805 Plastic with 8/32 threaded stud—7/32″ long 21/32″ H. x 11/8″ dia. No screw.

K1793-(D) 21/8″ L. x 11/16″ dia. No set screw.

K1700-(4) 113/16″ H. x 19/16″ body O.D. Plastic body, metal cap, skirt and insert. 29/64″ skirt O.D.

K1792 1/4-20 threaded shaft. 3/4″ H. x 7/8″ dia. Color Gray.

K1349-(B.5) 11/16″ H. x 3/4″ dia.

K929 K936 K1334 K1344 K1349 K1350 K1359 K1792 K1945 K1946 K1993 K1997

K1344-(B.5) with .130 across flat. 7/8″ H. x 7/8″ dia.

K1359-(B) 9/16″ H. x 7/16″ OD. "P" on top filled. "Day-glo Saturn Yellow" or "White".

K1350-(B) 7/8″ H. x 7/8″ dia.

K1945-632 6-32 Threaded Shaft 17/32″ H. x 5/8″ OD.

K1993-(4) 5/8″ H. x 43/64″ dia.

K1946-632 6-32 Threaded Shaft 3/4″ OD., 3/4″ H. with 1/2″ dia. hub. (For 8-32 Threaded Shaft use **K1946-832**)

K936-(5) Knob dia. 11/8″; Skirt dia. 11/2″; overall height 13/32″. Beveled aluminum skirt, black anodized finish. Deeply etched and filled contrasting markings. Accurately centered brass insert.
K936-(4) KNOB ONLY
K929-(5) same as above less skirt.
K929-(4)

Variations on shaft sizes and markings available in production quantities. Single set screw.

K1334-(2) 5/8″ H. x 3/4″ dia. Notch: 3/32″

K1997-(4.25) 3/4″ H. x 13/8″ dia.

K1368 K1398 K1462 K1714 K1798 K1938 K1952 K2012 K2126

K1398/WD-(6) 11/16″ H. x 23/8″ dia

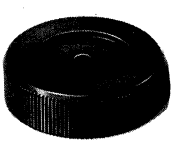
K2126-(4) 15/16″ H. x 15/8″ dia. with 13/16″ Hub dia.

K1798-(2) 1/2″ H. x 11/2″ dia.

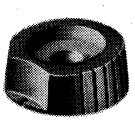
K1952-(4) 2 set screws, or for female or male threaded stud. 27/64″ H. x 11/8″ OD.

K1938-(3.5) 33/64″ H. x 11/2″ OD. Single set screw.

K1714-(4) 23/64″ O.D. x 3/8″ H.



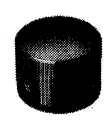
K2012-(4) 39/64″ H. x 2″ dia.



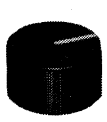
K1462-(4.25) 7/16″ H. x 1″ OD.

K1368-(D) 11/16″ H. x 11/16 dia.

K1331 K1347 K1348 K1464 K1579 K1771 K1783 K1789 K2089 K2099 K2124



K1331-(3) 3/4″ H. x 11/64″ dia.



K1579-(2)(4) 1/2″ H. x 7/8″ dia.

K1771-(4) 13/32″ H. x 119/32″ dia. Appearance same as JAN deluxe instrument knobs.

K1789-(B) 21/32″ H. x 1/2″ dia. Note: Same as deluxe inst. knobs, except w/flat cap.

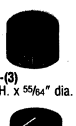
K1347-(2.5) 1/2″ H. x 3/4″ dia.

K1348-(2.5)(B.5) 1/2″ H. x 3/4″ dia.

K1464-(B) 11/16″ H. x 1/2″ OD.

K2124-(4) 3/4″ H. x 23/4″ dia.

K1783-(4) 1″ H. x 11/4″ dia. Top recess can be color coded.



K2089-(3) 19/32″ H. x 55/64″ dia.

K2099-(4) 19/32″ H. x 7/8″ dia.

Specials Are Our Specialty

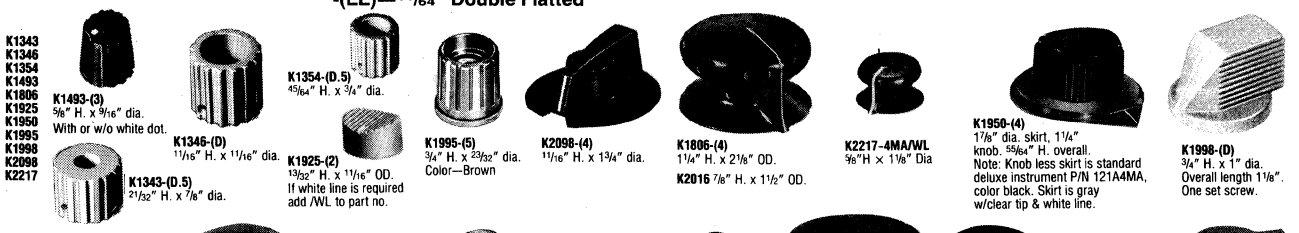
JAN HARDWARE
MANUFACTURING COMPANY INC.

MOLDED PLASTIC KNOBS WITH METAL INSERTS

Standard Shaft Holes—1/16″ increments.

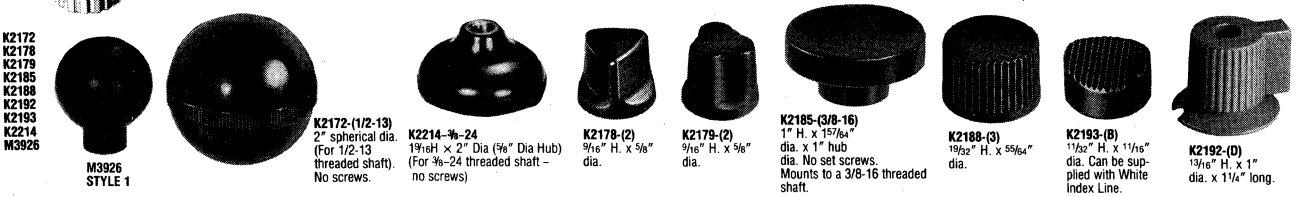
-(2)—1/8″
-(2.5)-5/32″
-(4)—1/4″
-(B)—1/8″ D Flatted
-(B.5)-5/32″ D Flatted
-(C)—3/16″ D Flatted
-(D)—1/4″ D Flatted
-(D1)—5/16″ D Flatted
-(BB)—1/8″ Double Flatted
-(BB.5)—5/32″ Double Flatted
-(CC)—5/16″ Double Flatted
-(DD)—1/4″ Double Flatted
-(DD1.3)—21/64″ Double Flatted
-(EE)—11/64″ Double Flatted

Nominal shaft dimensions: 1/8″ = .128 1/4″ = .253
Finish: M-Matte; G-Glossy; **/WD** = White Dot, **/WL** = White Line
Colors: A-Black; B-Red; C-Grey.
Typical Part No. K1697-(4)MA
(1/4″ shaft, Matte Finish, Black)



K1343
K1346
K1354
K1493
K1806
K1925
K1950
K1995
K1998
K2098
K2217

K1493-(3) 5/8″ H. x 9/16″ dia. With or w/o white dot.
K1346-(D) 11/16″ H. x 11/16″ dia.
K1354-(D.5) 45/64″ H. x 3/4″ dia.
K1343-(D.5) 21/32″ H. x 7/8″ dia.
K1925-(2) 13/32″ H. x 11/16″ OD. If white line is required add /WL to part no.
K1995-(5) 3/4″ H. x 23/32″ dia. Color—Brown
K2098-(4) 11/16″ H. x 13/4″ dia.
K1806-(4) 11/4″ H. x 21/8″ OD.
K2016 7/8″ H. x 1 1/2″ OD.
K2217-4MA/WL 5/8″H x 1 1/8″ Dia
K1950-(4) 17/8″ dia. skirt, 1 1/4″ knob. 55/64″ H. overall. Note: Knob less skirt is standard deluxe instrument P/N 121A4MA, color black. Skirt is gray w/clear tip & white line.
K1998-(D) 3/4″ H. x 1″ dia. Overall length 1 1/8″. One set screw.

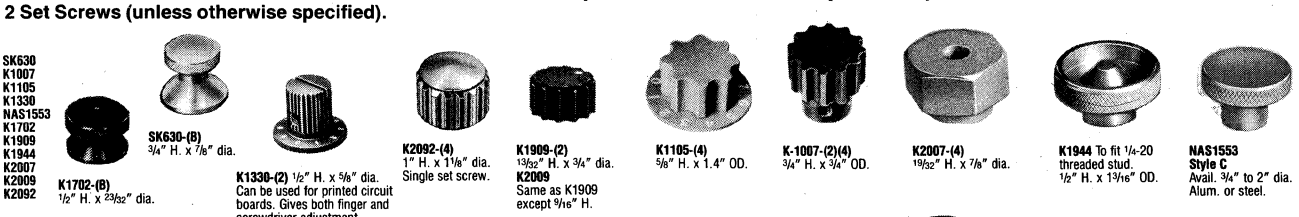


K2172
K2178
K2179
K2185
K2188
K2192
K2193
K2214
M3926

M3926 STYLE 1
K2172-(1/2-13) 2″ spherical dia. (For 1/2-13 threaded shaft). No screws.
K2214-3/8-24 19/16H × 2″ Dia (5/8″ Dia Hub) (For 3/8-24 threaded shaft – no screws)
K2178-(2) 9/16″ H. x 5/8″ dia.
K2179-(2) 9/16″ H. x 5/8″ dia.
K2185-(3/8-16) 1″ H. x 57/64″ dia. x 1″ hub dia. No set screws. Mounts to a 3/8-16 threaded shaft.
K2188-(3) 19/32″ H. x 55/64″ dia.
K2193-(B) 11/32″ H. x 11/16″ dia. Can be supplied with White Index Line.
K2192-(D) 13/16″ H. x 1″ dia. x 1 1/4″ long.

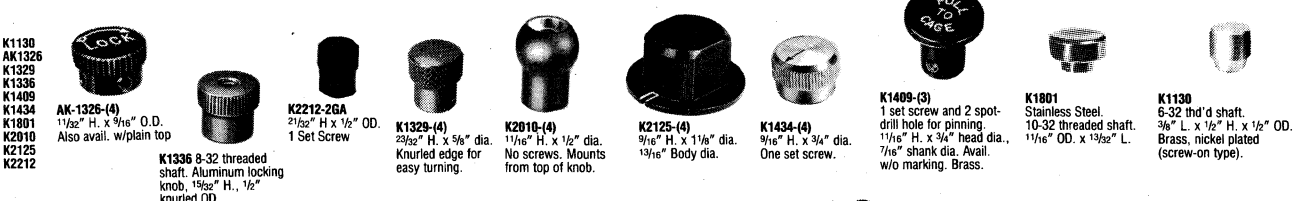
MACHINED METAL KNOBS—ALUMINUM (Unless Otherwise Specified).

2 Set Screws (unless otherwise specified).



SK630
K1007
K1105
K1330
NAS1553
K1702
K1909
K1944
K2007
K2009
K2092

K1702-(B) 1/2″ H. x 23/32″ dia.
SK630-(B) 3/4″ H. x 7/8″ dia.
K1330-(2) 1/2″ H. x 5/8″ dia. Can be used for printed circuit boards. Gives both finger and screwdriver adjustment.
K2092-(4) 1″ H. x 1 1/8″ dia. Single set screw.
K1909-(2) 13/32″ H. x 3/4″ dia.
K2009 Same as K1909 except 9/16″ H.
K1105-(4) 5/8″ H. x 1.4″ OD.
K-1007-(2)(4) 3/4″ H. x 3/4″ OD.
K2007-(4) 19/32″ H. x 7/8″ dia.
K1944 To fit 1/4-20 threaded stud. 1/2″ H. x 13/16″ OD.
NAS1553 Style C Avail. 3/4″ to 2″ dia. Alum. or steel.

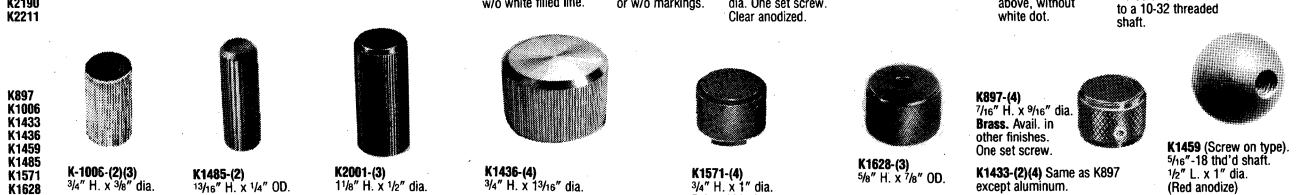


K1130
AK1326
K1329
K1336
K1409
K1434
K1801
K2010
K2125
K2212

AK-1326-(4) 11/32″ H. x 9/16″ O.D. Also avail. w/plain top
K1336 8-32 threaded shaft. Aluminum locking knob, 15/32″ H., 1/2″ knurled OD.
K2212-2GA 21/32″ H x 1/2″ OD. 1 Set Screw
K1329-(4) 23/32″ H. x 5/8″ dia. Knurled edge for easy turning.
K2010-(4) 11/16″ H. x 1/2″ dia. No screws. Mounts from top of knob.
K2125-(4) 9/16″ H. x 1 1/8″ dia. 13/16″ Body dia.
K1434-(4) 9/16″ H. x 3/4″ dia. One set screw.
K1409-(3) 1 set screw and 2 spot-drill hole for pinning. 11/16″ H. x 3/4″ head dia., 7/16″ shank dia. Avail. w/o marking. Brass.
K1801 Stainless Steel. 10-32 threaded shaft. 11/16″ OD. x 13/32″ L.
K1130 6-32 thd'd shaft. 3/8″ L. x 1/2″ H. x 1/2″ OD. Brass, nickel plated (screw-on type).

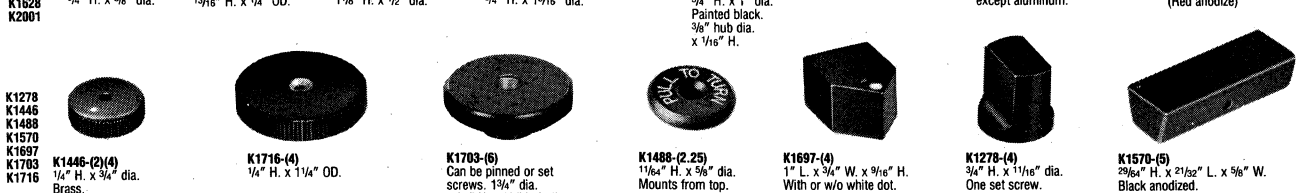
K1572
K1574
K1584
K1696
K1701
K1814
K1819
K2033
K2096B
K2130
K2190
K2211

K1814-(4) 1/2″ H. x 3/4″ dia.
K1696-(CC) Mounts from top. 9/16″ H. x 13/16″ OD.
K2211-4 5/8″ H x 5/8″ Dia Brass—Diamond Knurled
K1701-(2) 25/32″ H. x 5/8″ OD. One set screw.
K1572-(2) 7/8″ H. x 3/4″ dia. Black anodized, with or w/o white filled line.
K1574-(2) 1/2″ H. x 1/2″ dia. Painted black with or w/o markings.
K2190-(2) 9/16″ H. x 5/8″ dia. x 1/2″ hub dia. One set screw. Clear anodized.
K1584-(2) 1/2″ H. x 3/8″ OD.
K2033-(2) 33/64″ H. x 25/64″ dia. Steel.
K1819-2MA/WD 13/32″ H. x 3/8″ dia.
K819-2MA Same as above, without white dot.
K2130-(10-32) 7/8″ H. x 1″ dia. (Hub dia. 9/16″) No screws. Mounts to a 10-32 threaded shaft.
K2096-(B) 42/64″ H. x 9/16″ dia.



K897
K1006
K1433
K1436
K1459
K1485
K1571
K1628
K2001

K-1006-(2)(3) 3/4″ H. x 3/8″ dia.
K1485-(2) 13/16″ H. x 1/4″ OD.
K2001-(3) 1 1/8″ H. x 1/2″ dia.
K1436-(4) 3/4″ H. x 13/16″ dia.
K1571-(4) 3/4″ H. x 1″ dia. Painted black. 3/8″ hub dia. x 1/16″ H.
K1628-(3) 5/8″ H. x 7/8″ OD.
K897-(4) 7/16″ H. x 9/16″ dia. **Brass.** Avail. in other finishes. One set screw.
K1433-(2)(4) Same as K897 except aluminum.
K1459 (Screw on type). 5/16″-18 thd'd shaft. 1/2″ L. x 1″ dia. (Red anodize)



K1278
K1446
K1488
K1570
K1697
K1703
K1716

K1446-(2)(4) 1/4″ H. x 3/4″ dia. Brass. With or w/o white dot.
K1716-(4) 1/4″ H. x 1 1/4″ OD.
K1703-(6) Can be pinned or set screws. 13/4″ dia. 11/16″ H. x 3/4″ hub dia.
K1488-(2.25) 11/64″ H. x 5/8″ dia. Mounts from top.
K1697-(4) 1″ L. x 3/4″ W. x 9/16″ H. With or w/o white dot.
K1278-(4) 3/4″ H. x 11/16″ dia. One set screw.
K1570-(5) 29/64″ H. x 21/32″ L. x 5/8″ W. Black anodized.

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

CAST ALUMINUM KNOBS

2 Set Screws (unless otherwise specified).

Standard Shaft Holes—1/16″ increments.

-(2)—1/8″
-(2.5)-5/32″
-(4)—1/4″
-(B)—1/8″ D Flatted
-(B.5)-5/32″ D Flatted
-(C)—3/16″ D Flatted
-(D)—1/4″ D Flatted
-(D1)—5/16″ D Flatted
-(BB)—1/8″ Double Flatted
-(BB.5)—5/32″ Double Flatted
-(CC)—5/16″ Double Flatted
-(DD)—1/4″ Double Flatted
-(DD1.3)—21/64″ Double Flatted
-(EE)—11/64″ Double Flatted

Nominal shaft dimensions: 1/8″ = .128 1/4″ = .253
Finish: M-Matte; G-Glossy; **/WD** = White Dot, **/WL** = White Line
Colors: A-Black; B-Red; C-Grey.
Typical Part No. K1697-(4)MA
(1/4″ shaft, Matte Finish, Black)

K1005 K1022 K1023 K1024 K1389 K1461 K1773 K1775 K1802

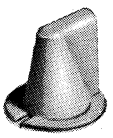
K-1005-(4)
7/8″ H. x 1″ skirt dia.
Overall length 15/16″.
Available with or without skirt.

K1773-(DD)
11/16″ H. x 1 1/8″ dia.
Mounts from top.

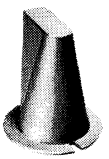
K1775-(4)
31/64″ H. x 1″ dia.
x 15/32″ L.

K2210-2MA
15/16″ H. x 1 1/8″ Dia.

K1802-(2)
15/32″ H. x 13/16″ L.
7/8″ dia. skirt.



K1389-(4)
27/32″ H. x 15/16″ dia.



No. K-1022-(4)
1 1/32″ H. x 15/16″ base dia.
Full Round Skirt

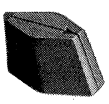
No. K-1023-(4)
Flat Back Round Skirt
1 1/32″ H. x 15/16″ base dia.
(29/32″ to flat back).

No. K-1024-(4)
With cam shape cut out in bottom of knob.
1 1/32″ H. x 15/16″ base dia.

K1461-(4)
1 1/8″ H. × 3/4″ OD.
(overall width incl. bar 15/16″) available with skirt.
One set screw

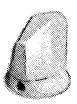
K1020 K1021 K1328 K1390 K1392 K1799 K1947 K2002

K2002-(4)
3/8″ H. x 1 1/8″ L. x 5/16″ body dia. (Available in plastic w/o metal insert. See **K2004**.)



K1947-(4)
3/4″ H. x 1 1/4″ L. x 5/8″ W.

K1390-(3)
11/16″ H. x 9/16″ dia.
One set screw.



K1392-(3)
25/32″ H. x 11/16″ dia.
(Bar is 13/16″ long).

K1328-(4)
11/16″ H. x 11/16″ dia.

K1020-(4)
11/16″ H. x 9/16″ base dia.

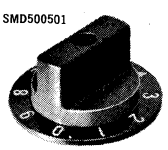
K1021-(4)
1 1/16″H × 1″ base dia.

K1799-(D)
59/64″ H. x 1 1/2″ dia.
One set screw.
For transilluminated knob see K-1800.

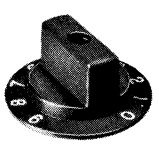
Other shaft diameters on request.

K1124 K1447 K1448 K1449 K1453 SMD500501 SMD500502

SMD500501

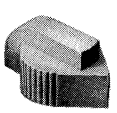


SMD500502

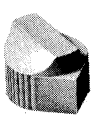


-(DD)
1/4″ double flatted shaft.
29/32″ H. x 1 15/16″ dia.

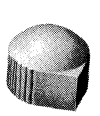
K1124-(2)
9/16″ H. x 1 1/16″ dia.
One set screw.



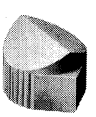
K1453-(4)
11/16″ H. x 1 1/2″ L.
x 15/16″ dia.
Tactile Top.



K1447-(4)
11/16″ H. x 15/16″ dia.
x 3/32″ L. Tactile "Bar" Top.

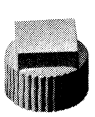


K1448-(4)
11/16″ H. x 15/16″ dia.
x 3/32″ L. Tactile "Sphere" Top.

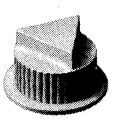


K1449-(4)
11/16″ H. x 15/16″ dia.
x 3/32″ L. Tactile "Edge" Top.

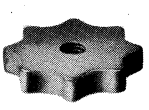
K1450 K1451 K1484 K1698 K1699 K1956 K1957



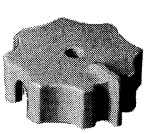
K1450-(4)
11/16″ H. x 15/16″ dia.
Tactile "Square" Top.



K1451-(4)
11/16 H. x 13/16″ skirt dia.
Tactile "Triangle" Top.

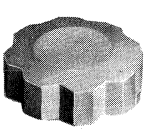


K1484 5/16-24 threaded shaft. 5/16″ H. x 15/8. OD.
Partial pin holes supplied for pinning to shaft.

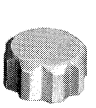


K1698-(4)
3/4″ H. x 2″ O.D.
One set screw.

K1699-(DD5)
1/2″ H. x 1″ dia.
Mounts from top.



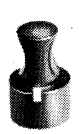
K1956-(4)
35/64″ H. x 15/8″ OD.



K1957-(4)
1/2″ H. x 1″ OD.

K1047 K1126 K1127 K1391 K1394 K1452 K1774 SCB41848

K1047-(B)
(Double D). 7/8″ H. x 1 1/8″ dia.

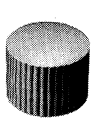


K1394-(2)
7/8″ H. x 1/2″ dia.

K1126-(DD)
15/32″ H. x 23/32″ dia.
Mounts from top.

K1127-(2)
15/32″ H. x 23/32″ dia.

K1391-(2)
43/64″ H. x 5/8″ dia.
White-fitted line.



K1452-(4)
11/16″ H. x 15/16″ dia.
Tactile "Round Ribbed" Top

SCB-41848-(4)
5/8″ H. x 1 13/16″ dia.

K1774-(5.25)
1 1/8″ H. x 2 1/8″ Dia.
Mounts from top.

K243 BK1080 K1387 K1432 K1460 K1770 K1790 MS21360 K2036

MS21360-1BID-(2)
1/2″ H. x 27/64″ OD.

K1790-(4)
p27/32″ H. x 49/64″ dia.

K1460-(4)
19/32″ H. x 7/8″ OD.

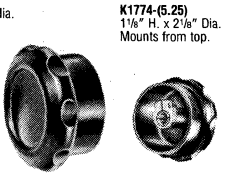
K1387-(2.5)
1/4″ H. x 23/32″ dia.

K1770-(2)(4)
1/2″ knob dia.,
17/32″ H. x 1″ skirt dia.

BK-1080-(B)
5/16″ H x 1/2″ OD.

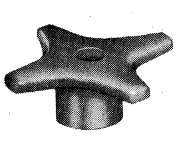
K2036
3/4″ H. x 9/16″ dia.
x 15/32″ L. For 17/64″ shaft.
.062 cross drilled
Stainless Steel.
Can be supplied with screws.

K1432-(5)
1 1/4″ H. x 1 7/8″ across wing. Body dia. 3/4″. Must be pinned to shaft.



TUNING KNOB K243-(5.5)
1 1/4″ H. x 25/16″ dia.
Use no-mar clamp (Cat. No. 937-8) for mounting. (Not supplied).

K1991 K2030 K2032 K2218 NAS1553

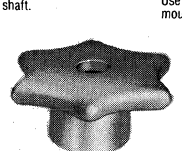


NAS1553 Style A
Avail. 3/4″ to 2 1/2″ dia.
Cast alum. or steel.

K2218-6MO
1 1/2″ H. x 2″ Dia. 3/4″ Dia. Hub
(Shaft drilled thru top)

NAS1553 Style B
Avail. 1 1/2″ to 3″ dia.
Cast alum. or steel.

K2030-(6)
3/8″ H. x 31/2″ dia.
Can be supplied for screw or pinning.
Steel.



K2032
1 15/32″ H. x 3 1/2″ dia.
Hub dia. 15/8″.
Threaded 7/16″-20

K1991-(6)
1″ H. x 1 1/2″ dia.
No screws. 2 holes for pinning to shaft.

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

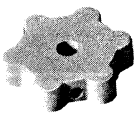
CAST ALUMINUM KNOBS, 2 SET SCREWS (Unless otherwise specified).

Standard Shaft Holes—1/16″ increments.

-(2)—1/8″ -(B)—1/8″ D Flatted -(BB)—1/8″ Double Flatted
-(2.5)-5/32″ -(B.5)-5/32″ D Flatted -(BB.5)—5/32″ Double Flatted
-(4)—1/4″ -(C)—3/16″ D Flatted -(CC)—5/16″ Double Flatted
-(D)—1/4″ D Flatted -(DD)—1/4″ Double Flatted
-(D1)—5/16″ D Flatted -(DD1.3)—21/64″ Double Flatted
-(EE)—11/64″ Double Flatted

Nominal shaft dimensions: 1/8″ = .128 1/4″ = .253
Finish: M-Matte; G-Glossy; **/WD** = White Dot, **/WL** = White Line
Colors: A-Black; B-Red; C-Grey.
Typical Part No. K1697-(4)MA
(1/4″ shaft, Matte Finish, Black)

K0002
K0003
K0004
K0005
K0006
K0007



K0002-(4.7)
1/2″ H. x 19/32″ dia.
No screws - pin to shaft.

K0003
15/32″ H. x 11/16″ dia.
x 13/8″ L. Single set screw.

K0004-(4.5)
1/2″ H. x 19/32″ dia. x 159/64″ L.
No screws - pin to shaft.

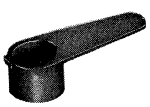
K0005-(4)
7/16″ H. x 123/64″ dia.
No screws - mounts from top.

K0006-(5.5)
1/2″ H. x 17/16″ dia.
Steel.

K0007
5/16″ H. x 129/64″ dia.
x 215/32″ L. Steel casting.

K0009
K0010
K0011
K0012
K0013
K0014

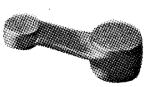
K0009-(8)
15/16″ H. x 15/64″ dia.
x 13/4″ L. Brass.



K0010-(8)
1/2″ H. x 5/8″ dia. x 147/64″ L.
Steel. No screws - pin to shaft.

K0011
5/8″ H. x 3/4″ wide x
17/16″ L. Single set screw.

K0012-(3.5)
45/64″ H. x 11/4″ dia.



K0013-(4)
21/32″ H. x 21/32″ dia.
x 13/4″ L.

K0014-(2)
53/64″ H. x 117/32″ L.
Steel.

K0015
K0016
k0018
K0019
K0020
K0021
K0041

K0015-(2)
7/16″ H. x 19/64″ dia.
x 23/32″ L. Brass.

K0016-(D1.3)
11/32″ H. x 53/64″ dia.
(For 21/64″ dia. x 17/64″ double flatted shaft hole)
No screws - pin to shaft.

K0018-(4)
55/64″ H. x 27/32″ dia.
(Hub 13/32″ dia.)
Brass.

K0019-(2.5)
1/2″ H. x 2″ dia.
(Hub dia. 1″)

K0020-(D1)
15/64″ H. x 41/64″ dia.
(Shaft Hole 5/16″ Round - 1/4″ Flat)
Brass casting.

K0021-(2)
25/32″ H. x 1/2″ dia.
x 3/4″ L. (Hub dia. 3/8″)

K0041-(4)
61/64″ H. x
1 1/4″ dia. x
1 5/8″ overall
length. No screws
—mounts from
top. Brass.

K0023
K0024
K0025
K0026
K0027
K0028
K0029

K0023-(4)
3/4″ H. x 17/32″ dia.

K0024
35/64″ H. x 25/32″ dia.
(for 5/8″ x 5/16″ rectangular shaft).

K0025-(4)
1″ H. x 13/16″ dia.

K0026-(2)
3/4″ H. x 21/64″ dia.

K0027-(D)
11/16″ H. x 21/32″ dia.
x 13/32″ L.

K0028-(2)
1/2″ H. x 27/64″ dia.
x 51/64″ L. Steel.

K0029-(4)
11/16″ H. x 1″ L. x 1/2″ dia.

K0030
K0031
K0032
K0033
K0035
K0036

K0030
41/64″ H. x 1 1/4″ L.
(has shaft for 3/8 x 11/32″
rectangular shaft hole)
Steel. No screws.

K0031-(3)
1/4″ H. x 1/2″ dia. x
115/32″ L. Brass.

K0032-(2)
13/16″ H. x 5/8″ L.
Steel.

K0033-(4)
7/16″ H. x 33/64″ dia. x 1 1/2″ L.
Brass or steel.

K0035-(2)
59/64″ H. x 117/32″ L.
Brass.

K0036-(3)
1/4″ H. x 7/8″ L.
Steel. 1 set screw.

K0038
K0039
K0040
K2087
K2090
K2091

K0038-(2)
3/16″ H. x 3/4″ L. x 25/64″ dia.
Body Brass.

K0039-(5)
11/32″ H. x 19/32″ dia.
x 135/64″ L. Brass.

K0040-(2)
19/64″ H. x 51/64″ dia.
Brass.

K2087-(DD)
17/32″ H. x 47/64″ dia.
x 13/32″ L.
Single screw hole on top.

K2090-(4)
13/32″ H. x 37/8″ dia.

K2091-(3)
3/4″ H. x 1″ dia.
Single set screw and
1 hole for pinning.

K0022
K2173
K2174
K2176
K2177
K2180
K2181

K0022-(4)
13/8″ H. x 25/8″ L.
(Hub dia. 1/2″)

K2173-(3)
49/64″ H. x 11/32″
dia. x 121/64″ long.

K2174-(4)
11/16″ H. x 21/8″ dia.

K2176-(4)
7/8″ H. x 1 1/16″
overall length x
1/2″ body dia. x
11/32″ hub dia.

K2177-(2.5)
49/64″ H. x 1 1/4″
overall length x
3/4″ body dia. x
11/32″ hub dia. (For
5/32″ shaft dia.)

K2180-(2)
219/64″ H.
x 3″ wide.
One set
screw.

K2181-(4)
7/16″ H. x 1 1/2″ dia.
No set screws.
Mounts by pinning
to shaft. Material
—Bronze (Olive
Drab).

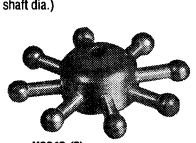
K0042
K0043
K1306
K2183
K2184
K2186

K2183-(2) or (4)
1 1/2″ H. x 1″
dia. x 27/64″
hub dia.

K1306-(DD)
1/2″ H. x 31/32″ dia. Mounts
with screw from top
of knob into threaded
end of a shaft. (Olive Drab).

K2184-(10-32)
11/16″ H. x 1 1/8″
wide x 11/32″ hub dia.
(For 10-32 threaded
shaft). Material—
Bronze (Olive Drab).

K2186-(.370″)
113/32″ H. x 21/4″ dia.
One set screw plus
one hole for pinning.
(Olive drab).



K0043-(3)
19/32″ H. x 113/16″ dia. x
51/64″ hub dia. No screws
—mounts from top.

K0042-(6)
13/16″ H. x 29/16″ long x
9/16″ hub dia. Brass.

Specials Are Our Specialty

JAN HARDWARE
MANUFACTURING COMPANY INC.

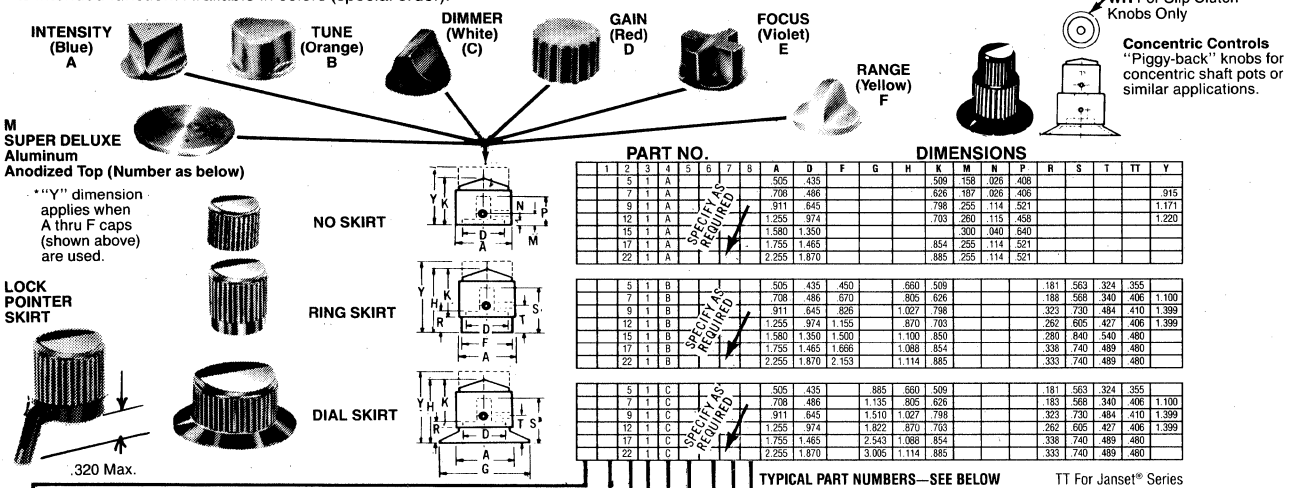
KNOBS, DELUXE INSTRUMENT
ROUND, ROUND FUNCTIONAL, TACTILE SHAPES

Visual and tactile function identifications. Tactile Knobs are in standard color & Configuration for its intended function. Available in colors (special order).

Configuration meets performance **MS91528,** MIL-K-3926 and MIL STD. 24 2D (ships). Knobs meet environmental conditions MIL-E-16400. **QPL #3926—T.R. #J101.** Patents: **4,012,966** and **4,077,503.** Others pending.

WR For Slip Clutch Knobs Only

Concentric Controls "Piggy-back" knobs for concentric shaft pots or similar applications.



PART NO. 1	2	3	4	5	6	7	8	A	D	F	G	H	K	M	N	P	R	S	T	TT	Y
	5	1	A					.505	.435				.509	.158	.026	.406					
	7	1	A					.708	.486				.626	.187	.026	.406					.915
	9	1	A					.911	.645				.798	.255	.114	.521					1.171
	12	1	A					1.255	.974				.703	.260	.115	.458					1.220
	15	1	A					1.580	1.350					.300	.040	.640					
	17	1	A					1.755	1.465				.854	.255	.114	.521					
	22	1	A					2.255	1.870				.885	.255	.114	.521					
	5	1	B					.505	.435	.450		.660	.509				.181	.563	.324	.355	
	7	1	B					.708	.486	.570		.805	.626				.188	.568	.340	.406	1.100
	9	1	B					.911	.645	.826		1.027	.798				.323	.730	.484	.410	1.399
	12	1	B					1.255	.974	1.155		.870	.703				.262	.605	.427	.406	1.399
	15	1	B					1.580	1.350	1.500		1.100	.850				.280	.840	.540	.480	
	17	1	B					1.755	1.465	1.666		1.088	.854				.338	.740	.489	.480	
	22	1	B					2.255	1.870	2.153		1.114	.885				.333	.740	.489	.480	
	5	1	C					.505	.435			.885	.660	.509			.181	.563	.324	.355	
	7	1	C					.708	.486			1.135	.805	.626			.183	.568	.340	.406	1.100
	9	1	C					.911	.645			1.510	1.027	.798			.323	.730	.484	.410	1.399
	12	1	C					1.255	.974			1.822	.870	.703			.262	.605	.427	.406	1.399
	17	1	C					1.755	1.465			2.543	1.088	.854			.338	.740	.489	.480	
	22	1	C					2.255	1.870			3.005	1.114	.885			.333	.740	.489	.480	

SPECIFY AS REQUIRED

TYPICAL PART NUMBERS—SEE BELOW TT For Janset® Series

1 CAP STYLE (Color of Tactile)
0 = NO TOP—Shaft Hole Drilled Thru
A = (INTENSITY - Blue)
B = (TUNE - Orange)
C = (DIMMER - White)
D = (GAIN - Red)
E = (FOCUS - Violet)
F = (RANGE - Yellow)
M = (ALUM ANODIZED TOP)
T = STANDARD TOP (PREFIX NOT REQUIRED) Use only when color of standard shape top differs from body color. Precede T by color code from Column 7 (BT = RED top standard shape).

2 BODY DIA.
5 = .51
7 = .71
9 = .91
12 = 1.25
17 = 1.75
22 = 2.25

3 BODY STYLE
1 = ROUND
2 = POINTER
8 = HEX SHAPE

4 SKIRT
A = NO SKIRT
B = RING
C = DIAL W/POINTER
D = DIAL W/O POINTER
H = DIAL W/SLOT
J = RING SKIRT W/POINTER

5—SHAFT HOLE DIA. ±.001
2 = .128
3 = .190
4 = .253
4.25 = .268
5 = .315
6 = .378
7 = .441
"D" FLAT SHAFT HOLES
B = .107 (1/8")
D = .222 (1/4")

6 FINISH
M = MATTE
G = GLOSSY

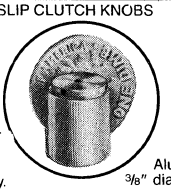
7 COLOR
A = BLACK
B = RED
C = GREY
D = GREEN
E = YELLOW
F = PURPLE
G = BLUE
H = WHITE
J = ORANGE
K = BROWN

8 MARKING For no marking, omit
/WD = WHITE DOT
/FD = FLUORESCENT DOT
/PD = POSPHORESCENT DOT
/FA = FLUORESCENT ARROW
/PA = PHOSPHORESCENT ARROW
/BL = BACKLIGHTED
/WL = WHITE LINE
/BD = BLACK DOT
/WB = WHITE BULLSEYE ON TOP OF KNOB
/WR = WHITE RING (for concentric)

JANSET® FUNCTIONAL KNOBS
"PUSH-TO-SET" OR "PUSH-TO-TURN"

FEATURES:
- Dimensions (see chart above).
- Installation: Same as a standard knob.
- Locks shaft automatically, upon release.
- Release Brake when depressed: settings can be altered.
- Resolution: Infinite, with zero backlash.
- Shaft Registration: to indicators, ie.: arrows, dots, cut-outs, etc.
- Shock or vibration settings are guarded against accidental change.
- Integral Assembly: Mechanism completely enclosed in knob body.
- Old designs: Janset® Knobs require no modification to existing panels.
- Shaft sizes: 1/8 thru 1/4 dia. (except 1/2 dia. knob, 5/32" shaft dia. max.)
- Panel Bushings: Fits with all 1/4 and 3/8 standard.
- Space: No space required behind panel; all functions within knob body.

SLIP CLUTCH KNOBS



Aluminum. 3/8" dia. x 1/2" high.

PREFIX
S (Slip Clutch)
PT (Push-To-Turn)
PSC (Push-To-Set)
PSCE (Push-To-Set w/Limit Stop)
LSC* ** (Pull-To-Turn)
PTN (Spin Free Push-To-Turn)
PTCN (Spin Free Push-To-Turn)
PTNN (Spin Free Press-To-Turn)
LTN (Spin Free Lift-To-Turn)
TC (Torque)
LEPR (Limit Stop & Release)
LELR (Limit Stop & Release)

SLIP CLUTCH: Prevent over torquing delicate mechanisms. Functions as standard knob between limit stops. When limit is reached and knob rotation continues, clutch overrides the stop without applying torque in excess of specifications. Driving torque in detented position .5–6 LB./IN. (depending on knob diameter).
BRAKE KNOB: Prevents control setting from movement due to shock or vibration.

Brake Knob W/ OVERRIDING CLUTCH: Same as "PT" with added feature of "S" (slip clutch) combined. Knob can be rotated without changing setting (if not pushed in).
Brake Knob W/ Overriding Clutch & LIMIT STOP: Same as "PT" & "PSC" with added feature of limit top (320° MAX) built in.

Brake Knob W/ Overriding Clutch—PULL-TO-TURN: Same as "PSC" except pull-to-turn. For use in extremely hostile environment, i.e.: Life Support Equipment.
SPIN FREE PUSH-TO-ENGAGE: Prevents shaft from inadvertent turning—Knob spins free unless depressed and rotated until full internal engagement is accomplished for use where SHAFT TORQUE EXCEEDS 4 oz. in.

Spin Free PUSH-TO-ENGAGE: Same as "PTN" except for use where SHAFT TORQUE is LESS THAN 4 oz. in.

Spin Free PRESS-TO-TURN: (Friction) Prevents inadvertent change of setting. Use only where intent to turn is required. Must be pressed in while turning, for low torque applications.

Spin Free LIFT-TO-TURN: Same as "PTN" except pull-to-turn. For use where SHAFT TORQUE EXCEEDS 4 oz. in.

TORQUE KNOB: (Friction) For use where positive feel is deisred and/or where minor excursions of shock and vibration are anticipated.
LIMIT STOP W/ QUICK RELEASE: For use where limited travel (0–? degrees) is required. Push-To-Release stop and continue to the next function.

Same as LEPR except PULL-TO-RELEASE: For use in extremely hostile environment, i.e.: Life Support Equipment.
SPECIAL KNOBS TO YOUR SPECIFICATIONS (Give full description and/or sketch)

INCREMENTAL KNOBS
Repositions to the exact point, with zero backlash. Easily provides precise setting to pre-determined positions. Can be repeated with finite exactness to as many as 32 or as few as a single position.

Cap		
EE	1	B
GG	1	B
II	1	B
LL	1	B
OO	1	B
VV	1	B
EE	1	C
GG	1	C
II	1	C
LL	1	C
OO	1	C
VV	1	C

PART NO.

(9) NO. OF INCREMENTAL POSITIONS
SPECIFY 1 THRU 32.

(10) INCREMENTAL ANGLES
E = Equal Angles
N = Unequal Angles*
*Supply table of angular increments in degrees and minutes. See Table.
*SAMPLE OF TYPICAL TABLE (to be supplied)

Position	Increment Angle	Total Angle
1	0	0
2	5	5
3	4	9
4	25	34
5	266	300

(11) TOTAL ANGULAR ROTATION IN DEGREES AND MINUTES
SPECIFY 0° to 360°

FOR DIMENSIONS SEE TABLE ABOVE (COLUMNS A - Y)

TYPICAL PART NUMBERS
S71C4MC = Slip Clutch knob/.708 Dia./Dial Skirt/.253 Shaft Hole/Matte/Gray
PT71B4GA = Brake Knob marked Push-To-Turn/.708 Dia./Ring Skirt/.253 Shaft Hole/Glossy Black
PSC91B4MA = Brake Knob marked Push-To-Set w/Overriding Clutch/.911 Dia./Ring Skirt/.253 Shaft Hole/Matte/Black
PS91C4GA = Push-To-Turn Brake Knob with cap marked Push-To-Set/.90 Dia./Round/Dial/1/2"/Glossy/Black

TYPICAL PART NUMBERS
IIB4MA/WD (17E 180°) = Standard Top/.90 Dia./Round/Plain/.253 Dia. Shaft Hole/Matte/Black/White Dot/17 Incremental Positions/Equally Spaced, in 180° Rotation.
MLL1C4GB (5N 300°) = Aluminum Anodized Top/1.25 Dia./Round/Dial with Pointer/.253 Dia. Shaft Hole/Glossy/Red/5 Incremental Positions/Unequally Spaced, in 300° Rotation (See Table).

JAN HARDWARE • 47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: 718-361-0800 • FAX: 718-784-0796

Specials Are Our Specialty

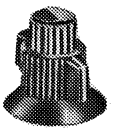
JAN HARDWARE
MANUFACTURING COMPANY INC.

KNOBS, DELUXE INSTRUMENT

POINTER (2); DOUBLE BAR (3); BAR POINTER (5), (6); BAR (7); HEX (8); CRANK (4); ROUND (DEEP FLUTED)

Visual and tactile function identifications. Tactile Knobs are in standard color & Configuration for its intended function. Available in other colors (special order).

Configuration meets performance **MS91528,** MIL-K-3926 and MIL STD. 24 2D (ships). Knobs meet environmental conditions MIL-E-16400. **QPL #3926—T.R. #J101.** Patents: **4,012,966** and **4,077,503.** Others pending.

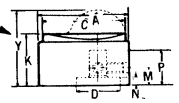


Concentric Controls
"Piggy-back" knobs for concentric shaft pots or similar applications.

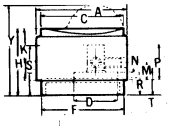
51A & 73 Series

RANGE (Yellow) G

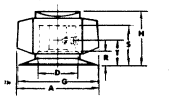
POINTER NO SKIRT (2)A



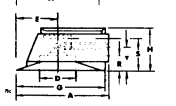
POINTER RING SKIRT (2)B



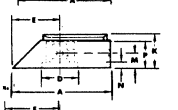
DOUBLE BAR 7(3)D



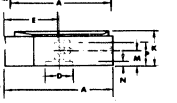
BAR POINTER (SHORT) 7(5)C



BAR POINTER (LONG) 7(6)A



BAR KNOB 7(7)A

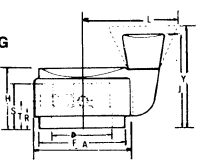


HEX 7(8)B

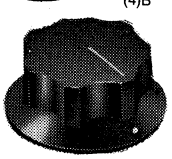
MARKER (Green) H

BEARING (Grey) J

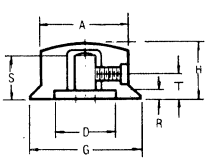
STANDARD HANDLE (4)B



METAL INLAY TOP



C SKIRT



B SKIRT

POINTER KNOBS

PART NO.	A	D	E	F	H	K	M	N	P	R	S	T	Y
5 2 A	.750	.406	.510			.505	.158	.026	.402				
7 2 A	1.038	.486	.690			.619	.187	.026	.406				.918
9 2 A	1.344	.645	.895			.796	.255	.114	.555				1.171
5 2 B	.750	.406	.510	.669	.655	.505			.402	.177	.563	.324	
7 2 B	1.038	.486	.690	.940	.791	.619			.406	.193	.573	.364	1.100
9 2 B	1.344	.645	.895	1.251	1.051	.796			.555	.328	.796	.479	1.400

SPECIFY AS REQUIRED

	A	D	F	G	H	K	M	N	P	R	S	T
7 3 A	1.150	.486				.610	.187	.026	.406			
7 3 B	1.150	.486	.680		.782					.183	.568	.364
7 3 D	1.150	.486		1.135	.782					.183	.568	.364

SPECIFY AS REQUIRED

	A	D	E	G	H	K	M	N	P	R	S	T
7 5 A	1.515	.515	.575			.645	.250	.110	.445			
7 5 C	1.720	.515	.780	1.520	.815					.266	.590	.435

SPECIFY AS REQUIRED

PART NO.	A	D	E	G	H	K	M	N	P	R	S	T
7 6 A	1.855	.595	.900			.645	.250	.110	.445			
7 6 D	1.870	.470	.915			.815	.435	.266	.590			

SPECIFY AS REQUIRED

	A	D	E	G	H	K	M	N	P	R	S	T
7 7 A	2.552	.562	1.290			.869	.348	.177	.739			

HEX KNOBS

SPECIFY AS REQUIRED

	A Flats	D	F	G	H	K	M	N	P	R	S	T	Y
7 8 A	.880	.645				.798	.255	.114	.521				1.171
7 8 B	.880	.645	.826		1.027	.798				.323	.730	.484	1.399
7 8 C	.880	.645		1.510	1.027	.798				.323	.730	.484	1.399

CRANK KNOBS

SPECIFY AS REQUIRED

	A	D	F	H	J	L	R	S	T	Y
12 4 B	1.290	.685	1.185	.850	1.350	1.275	.250	.605	.427	1.475
17 4 B	1.758	.685	1.666	1.070	1.758	1.735	.320	.740	.489	1.940
22 4 B	2.250	.685	2.185	1.095	1.782	1.970	.320	.740	.489	1.970

INSTRUMENT KNOBS — DEEP FLUTED (ALSO SUPPLIED WITH SLIP CLUTCH MECHANISM)

SPECIFY AS REQUIRED

	A	D	G	H	R	S	T
6 1 B	5/8	9/16		7/16	1/16	3/8	7/32
8 1 B	13/16	11/16		19/32	3/32	1/2	9/32
10 1 B	1	11/16		21/32	3/32	1/2	9/32
13 1 B	1 1/4	31/32		3/4	5/32	9/16	11/32
16 1 B	1 5/8	13/16		7/8	3/32	21/32	13/32

SPECIFY AS REQUIRED

	A	D	G	H	R	S	T
6 1 C	5/8	9/16	3/4	7/16	1/16	3/8	7/32
8 1 C	13/16	11/16	1	15/32	3/32	1/2	9/32
10 1 C	1	11/16	1 1/4	21/32	3/32	1/2	9/32
13 1 C	1 1/4	31/32	1 1/2	3/4	5/32	9/16	11/32
16 1 C	1 5/8	13/16	2	7/8	3/32	21/32	13/32

1 — CAP STYLE
(Color of Tactile)
O = NO TOP — Shaft Hole Drilled Thru
A = (INTENSITY - Blue)
B = (TUNE - Orange)
C = (DIMMER - White)
D = (GAIN - Red)
E = (FOCUS - Violet)
F = (RANGE - Yellow)
M = ALUM ANODIZED TOP
H = (MARKER - Green)†
J = (BEARING - Grey)†

2 — BODY DIA.
5 = .51
6 = .62
7 = .71
8 = .80
9 = .91
10 = 1.00
12 = 1.25
13 = 1.25
16 = 1.62
17 = 1.75
22 = 2.25

3 — BODY STYLE
1 = ROUND
2 = POINTER
3 = BAR, ROUND
4 = SPINNER
5 = BAR, SHORT
6 = BAR, LONG
7 = BAR—HIGH TORQUE
8 = HEX SHAPE

4 — SKIRT
A = No Skirt
B = Ring (see F dim.)
C = Skirt with Marker
D = Skirt w/o Marker
H = Dial w/slot
J = Ring Skirt w/Pointer

5 — SHAFT HOLE DIA. ±.001
2 = .128
3 = .190
4 = .253
4.25 = .268
5 = .315
6 = .378
7 = .441
"D" FLAT SHAFT HOLES
B = .107 (1/8")
D = .222 (1/4")
(Standard—with metal insert. "O" preceding these numbers means w/o metal insert)

6 — FINISH
M = MATTE
G = GLOSSY

7 — COLOR
A = BLACK
B = RED
C = GREY
D = GREEN
E = YELLOW
F = PURPLE
G = BLUE
H = WHITE
J = ORANGE
K = BROWN

8 — MARKING
/WD = WHITE DOT
/WL = WHITE LINE ON TOP
/FL = FLUORESCENT LINE
/PL = PHOSPHORESCENT LINE
/FD = FLUORESCENT DOT
/PD = PHOSPHORESCENT DOT
/FA = FLUORESCENT ARROW
/PA = PHOSPHORESCENT ARROW
/BL = BACKLIGHTED
/BD = BLACK DOT
For no marking, omit

T = STANDARD TOP (PREFIX NOT REQUIRED) Use only when color of standard shape top differs from body color. Precede T by color code from Column 7 (BT = RED top standard shape).

TYPICAL PART NUMBERS
91C4GA = .90 Dia./Round/Dial/1/4"/Glossy/Black
A71B4MA = Triangle Top Blue/.72/Round/Plain/1/4"/Matte/Black
124B4MA = 1.25 dia./Crank (Spinner)/Plain/1/4"/Matte/Black
BT71B4MA = Standard Top Red/.72/Round/Plain/1/4"/Matte/Black
****071B4MA** = No Top. Shaft hole drilled thru/.72/Round/Plain/1/4"/Matte/Black.

TYPICAL PART NUMBERS
81D4GA = 13/16" Dia./Round/Skirt w/o indicator market 1/4" Shaft Hole Dia./w/o line on top/Glossy Black
101C4MA/WL = 1" Dia./Round/Skirt w/indicator marker/White Line on top/1/4" Shaft Hole Dia./Matte/Black
M61B2GA = 5/8" Dia./Round/Plain Skirt/no marking/metal top/1/8" Shaft Hole Dia./Glossy Black
61B2GA/WL = 5/8" Dia./Round/Plain Skirt/White Line on top/ no marking on skirt/1/8" Shaft Hole Dia./Glossy Black

SPECIAL KNOBS TO YOUR SPECIFICATIONS (Give full description and/or sketch)

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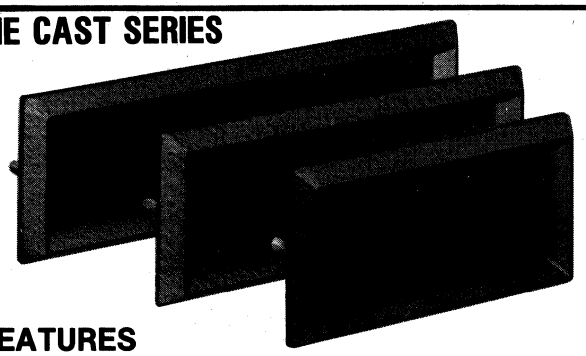
JMJ Technical Products, Inc.

STANDARD AND CUSTOM DIGITAL DISPLAY BEZELS

DIE CAST SERIES



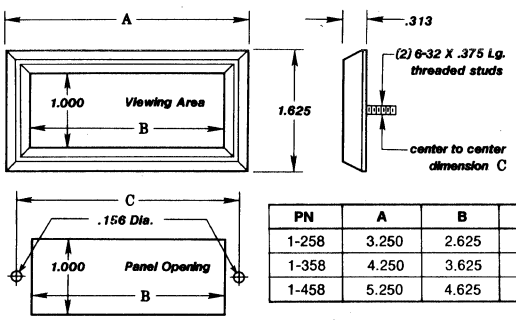
FEATURES

DIE CAST METAL FRAME

- Nonreflective black finish
- Durable — heat resistant
- Integral 6-32 mounting studs
- No exposed hardware
- Mounts in panels up to 3/16" thick
- Includes mounting hardware
- Available in three sizes
- Filters available in 10 colors and clear

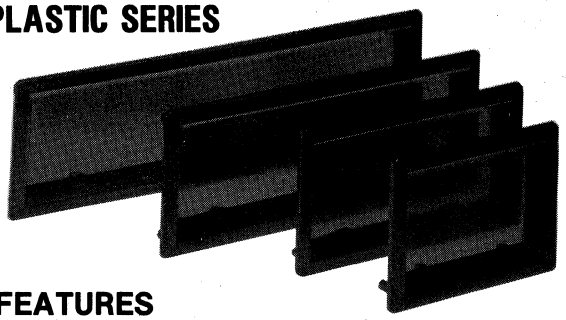
DESCRIPTION

The DIE CAST SERIES of bezels consist of a special plastic screen and a die cast metal frame. Mounting is accomplished by two 6-32 studs which can also be used to mount PC boards or other components behind the panel. The high quality of the screen and frame, combined with the universal sizes and mounting flexibility, make the bezels usable for a wide range of applications.



PN	A	B	C
1-258	3.250	2.625	3.000
1-358	4.250	3.625	4.000
1-458	5.250	4.625	5.000

PLASTIC SERIES



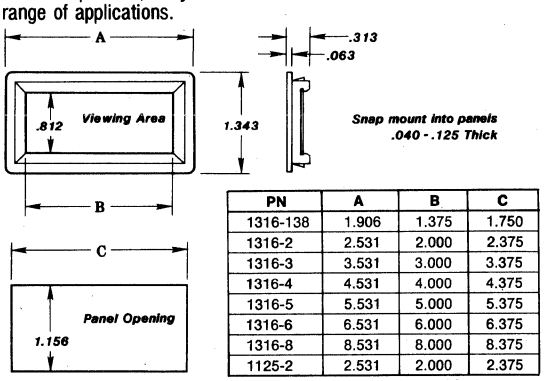
FEATURES

INJECTION MOLDED PLASTIC FRAME

- Nonreflective black finish
- Impact resistant ABS
- Snaps into front panels
- No exposed hardware
- Mounts in panels up to .125" thick
- Available in four sizes
- Filters available in 10 colors and clear

DESCRIPTION

The PLASTIC SERIES of bezels consist of a special plastic screen and an injection molded ABS frame. Mounting is accomplished by a snap-fit into rectangular cut-outs from the outside. The combination of a high quality filter and an inexpensive, easy to mount bezel make this series ideal for a wide range of applications.



PN	A	B	C
1316-138	1.906	1.375	1.750
1316-2	2.531	2.000	2.375
1316-3	3.531	3.000	3.375
1316-4	4.531	4.000	4.375
1316-5	5.531	5.000	5.375
1316-6	6.531	6.000	6.375
1316-8	8.531	8.000	8.375
1125-2	2.531	2.000	2.375

LOW COST CUSTOM BEZELS

Our new fabricating facility is totally dedicated to the production of non-standard bezels. Using specially designed machines, we can now offer made-to-order sizes in proto-type or production quantities, without costly tooling or extended lead times.

TYPICAL BEZEL MATERIALS

- Aluminum
- Stainless Steel
- Plastic

DESIGN FLEXIBILITY

- Panel Seals
- Welded Studs
- Any Size Viewing Area
- Multi-Opening Bezels

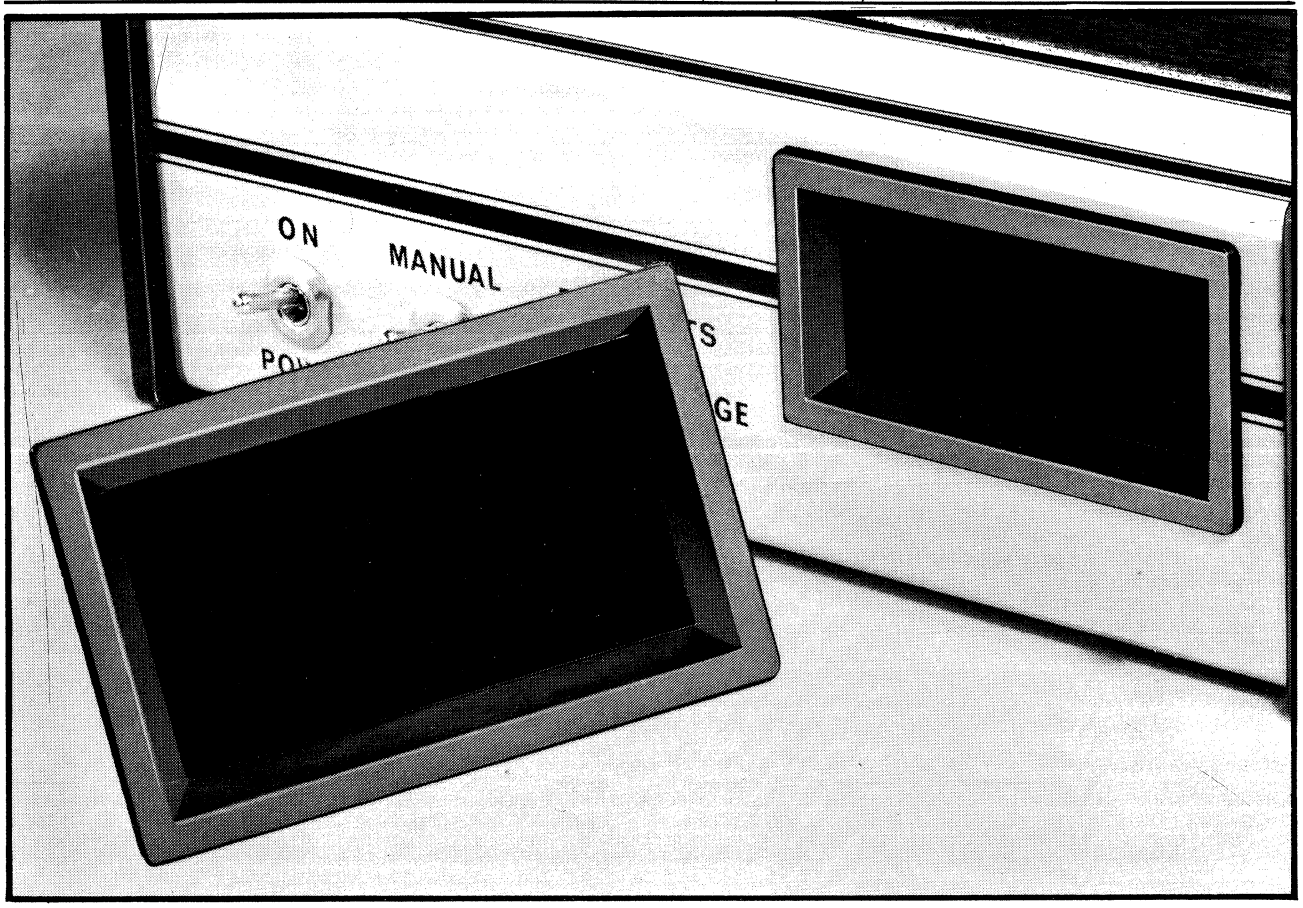
VARIETY OF FILTER MATERIALS

- Anti-Reflective Coatings
- Polycarbonate
- EMI Shielding
- Large Selection of Colors
- High Scratch Resistance

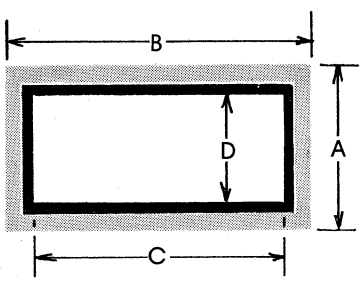
VARIETY OF FINISHING PROCESSES

- Anodizing
- Painting
- Screening
- Plating

Call or write for more information 50 Wheeler Point Rd., Newark, N.J. 07105 (201) 589-4257



RMF MODEL 140 SERIES BEZEL & FILTER ASSEMBLY



Whatever your application may be, these low-cost bezel and filter assemblies will improve the front panel appearance and make the display itself more readable.

Attractive ABS plastic bezels are available in many sizes to match the most popular types of displays.

The colored acrylic filters have a special non-glare surface to make viewing easier. Standard colors are red and clear for LED and LCD displays although any color is available on special order.

INSTALLATION is fast and simple . . . merely insert the filter into the slots on the rear of the bezel, then push the entire assembly into the panel cutout. A quick and easy operation without the use of any tools, adhesive or hardware. Recommended panel thickness is from .040 to .125 in.

	DIMENSIONS				PANEL OPENING		FILTER*	
MODEL	A	B	C	D	HEIGHT	WIDTH	HEIGHT	WIDTH
140-1	1.343	1.906	1.375	.812	1.156	1.750	.875	1.437
140-2	1.343	2.531	2.0	.812	1.156	2.375	.875	2.087
140-3	1.343	3.531	3.0	.812	1.156	3.375	.875	3.040
140-4	1.343	4.531	4.0	.812	1.156	4.375	.875	4.078
140-5	1.343	5.531	5.0	.812	1.156	5.375	.875	5.078
140-6	1.343	6.531	6.0	.812	1.156	6.375	.875	6.078
140-8	1.343	8.531	8.0	.812	1.156	8.375	.875	8.078
141-2	1.656	2.531	2.0	1.125	1.469	2.375	1.187	2.087

*Filter Material is .030 thick
New sizes are being added continually.
Please check with us if your requirements are not listed.

RMF PRODUCTS, INC.
P.O. Box 520, 1275 Paramount Parkway. Batavia, IL 60510
708 879-0020 FAX 708 879-6749

selco
Selco Products Co.
7580 Stage Road • Buena Park, CA 90621
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COLLET KNOBS

Function, styling, handling and simplicity of assembly were the designers' main criteria in the development of the Selco range of collet knobs. The various accessories (caps, pointers, figure dials and nut covers) push-fit into the basic knob to give added versatility. Caps are available in over 20 different colors.

MATERIALS

All knobs, caps, pointers and nut covers are made from Nylon and have a matte finish. The transparent figure dials are made from polycarbonate and the colored dials are of Nylon.

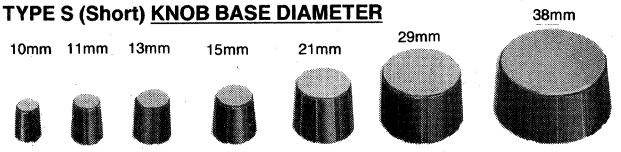
Collets, sleeves and nuts, installed into the knobs during manufacture, are of brass. They will accommodate a wide range of shaft lengths and bush lengths. All molded parts are stable in the temperature range −20°C to +70°C.

TURNING TORQUE

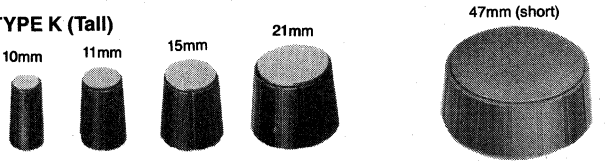
The torque that can be transmitted by knobs without slipping, assuming the knob has been adequately tightened on the shaft, is as follows:

Knob Type	Torque			
	Shafts 2mm, 3mm, 4mm, 1/8" and 3/16"		Shafts 6mm and 1/4"	
	In/Pds.	Ft./Pds.	In/Pds.	Ft./Pds.
S10, S11, SP11, K11	2.17	.18	–	–
S15, SP15, SB15, SW15	3.47	.288	6.94	.576
K15, W15, S21, SP21, SB21 SW21, K21, W21, S29, SP29, SB29, SW29, K29, W29, S38, SC38 S47	5.21	.432	10.42	.864

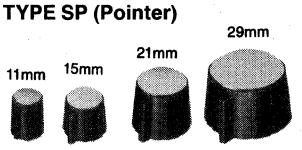
TYPE S (Short) KNOB BASE DIAMETER



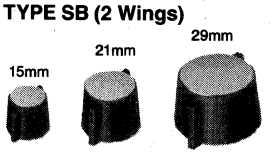
TYPE K (Tall)



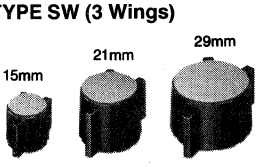
TYPE SP (Pointer)



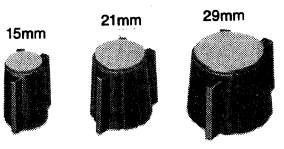
TYPE SB (2 Wings)



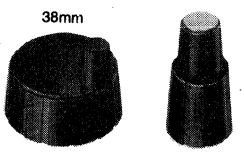
TYPE SW (3 Wings)



TYPE W (Tall 3 Wings)



TYPE SC — CRANKED KNOB

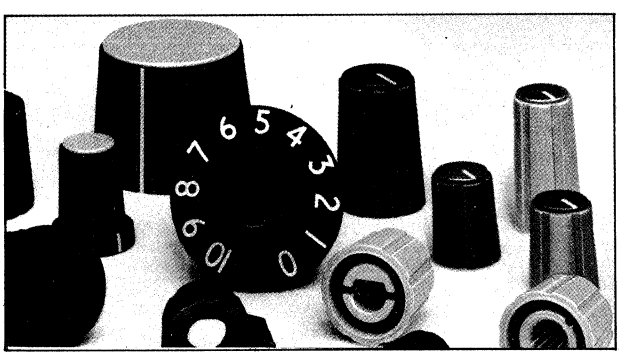


DUAL CONCENTRIC ASSEMBLIES

This table shows the knob combinations suitable for dual-concentric assemblies. Please contact sales office for details of special through-hole collets, if required.

TOP	10mm	11mm	15mm	21mm
BASE	13mm	15mm	21mm	29mm

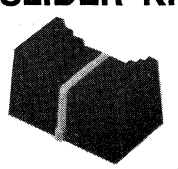
PUSH-ON KNOBS



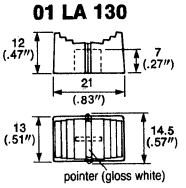
Selco push-on knobs provide a fast, secure method of shaft attachment. The internal molding is designed to grip the shaft securely with the option of a built-in metal compression ring. The knobs, molded from Nylon, are available in black, and gray and have a matte finish. Colored caps are available in plain, with-line and with-spot versions in over 20 different colors.

Selco also offers a full range of push-buttons for 3.33mm and 2.8mm switch shafts. (For use on ITT, Alps and other switches).

SLIDER KNOBS

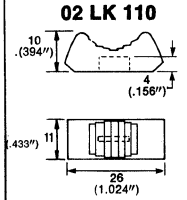


01 LA 130

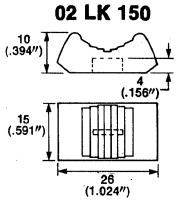


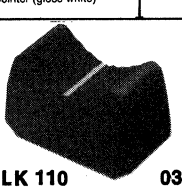
pointer (gloss white)

02 LK 110

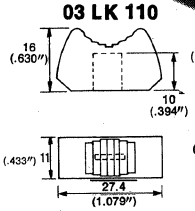


02 LK 150

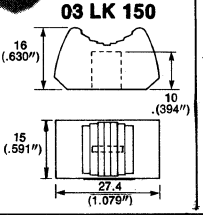




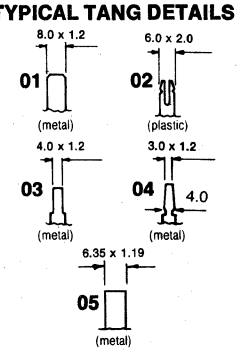
03 LK 110



03 LK 150



TYPICAL TANG DETAILS



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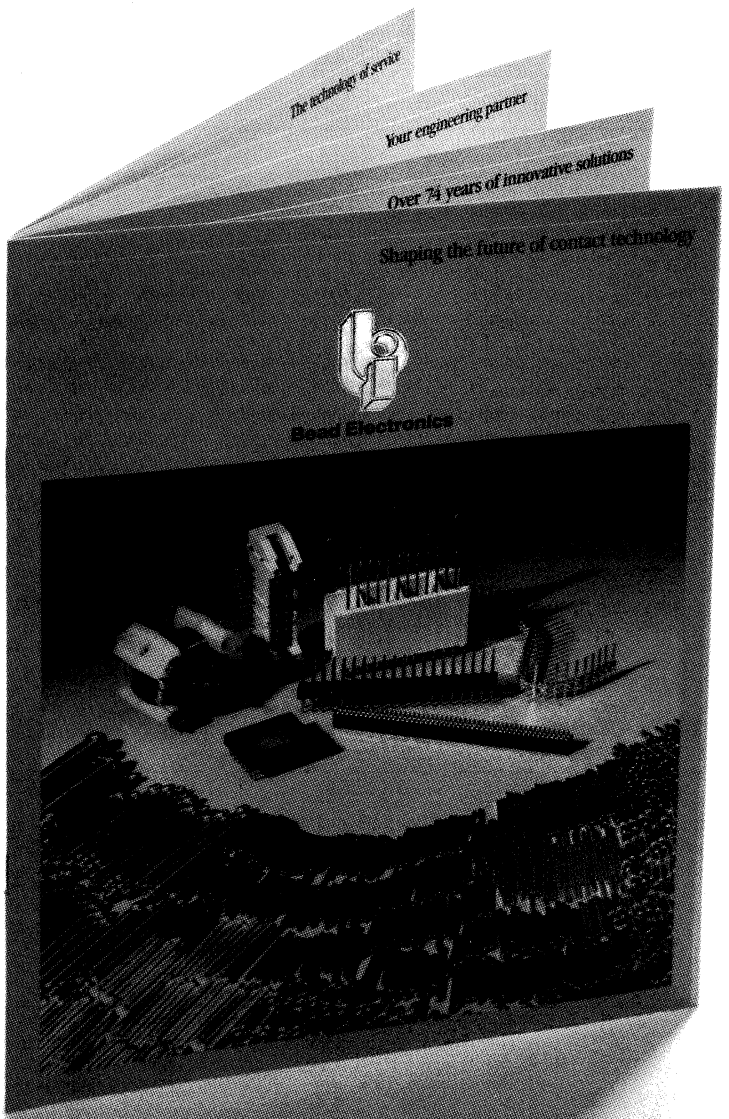

Bead engineers will work with your development teams to provide contact solutions that offer optimum benefits at the lowest possible cost. You can choose from:

- Tubular pins
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  - — Diameters from .030″ to .250″
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  - — Lengths up to 2″
  - — Round diameters as low as .016″
  - — Square cross sections as low as .012″

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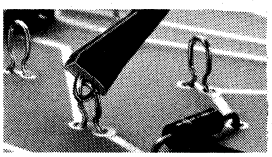
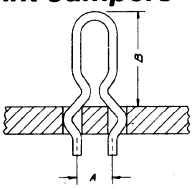
PRINTED CIRCUIT WIRE FORM PRODUCTS

TP-101 SERIES

P.C. Mount Test Point Jumpers





This low cost, printed circuit mounted test point jumper provides a reliable and economical solution for board level, trouble shooting applications. Available in a variety of popular mounting dimensions and loop profiles, the TP-101 series offers the designer flexibility in the placement of crucial test points on high density circuits.

SELECTION CHART *

P/N	A	B
TP-101-10	.100	.200
TP-101-20	.200	.300
TP-101-25	.250	.360
TP-101-30	.300	.400

* For other dimensions, call factory

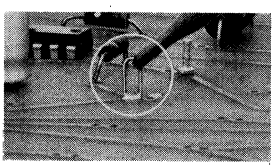
SPECIFICATIONS:

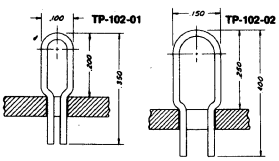
Material: .020" Dia. 70/30 brass wire
Finish: Bright, Electro-tin 100 millionths min.
Mounting: Two, .040" Dia. ±.003", plated through holes
Max. Current: 2 amperes

- **Lowest cost solution to board level trouble shooting**
- **Exclusive self-positioning feature**
- **Eliminate costly installation steps**

TP-102 SERIES

Single Hole, P.C. Mounted Test Points





The TP-102 series of printed circuit mounted, test point provides a significantly lower cost and superior function to that of conventional "turret" type terminals in board level, "trouble shooting" applications.

SPECIFICATIONS:

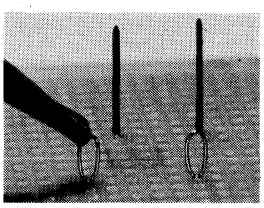
Material: .020" Dia. Cu/Ni/Sn wire (alloy #9-6)
Finish: Bright, Electro-tin .0001"
Mounting: .067" to .078" Dia. for TP-102-01
.112" to .116" for TP-102-02
Max Current: 2 amperes

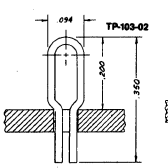
A convenient, inexpensive hand tool (model #1020) is available to facilitate placement of TP-102 test points during assembly operations.

- **Direct replacement for expensive "turret" type terminals**
- **Eliminates secondary installation steps**
- **Two styles accommodate complete range of popular "turret" hole diameters**

TP-103 SERIES

P.C. Mounted Test Points





With the incorporation of the TP-103 series of printed circuit board mounted test points, significant improvement in function, profile and safety may be realized over the use of .025" square wire wrap posts. The unique loop profiles of these units insure a secure anchor for spring loaded test hooks and scope probes; above board heights are dramatically reduced and technicians need no longer fear puncture wounds when involved in circuit "Trouble Shooting."

- **Direct replacement for .025" square "wrap posts"**
- **Positive retention for spring loaded probe hooks**
- **Significant reduction in profile without costly board re-design**

A convenient, inexpensive hand tool (model #1020) is available to facilitate placement of TP-103 test points during assembly operations.

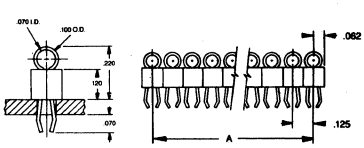
SPECIFICATIONS:

Material: .017" Dia., Cu/Ni/Sn wire, heat treated
Finish: Bright, Electro-tin .001"
Mounting: .040 Dia., (min.), plated through holes
Max. Current: 2 amperes

TP-104 SERIES

Color-Coded Test Points

- **Color coded for improved identification and visibility**
- **Breakaway strips for ease assembly**
- **Tandem mounting of up to 30 positions of 0.125 centers**



Features solid non-slip grip of test clips and probes, low profile, single hole wave-solderable mounting, and the elimination of skin punctures suffered by users of wrap posts as substitute test points.

Furnished in up to 30-position breakaway strips with 0.125" centers that make storage, handling, and tandem installations a snap. Hand tool #1040 enhances test point separating, gripping and positioning functions. Standard colors are red and black. Special colors available on order.

ORDERING INFORMATION

TP - 104 - 30 - 02

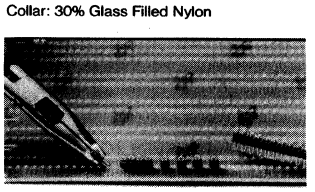
SERIES DESIGNATION:
NUMBER OF POSITIONS: 01 thru 30
COLOR: 00: Black, 01: Brown, 02: Red, 03: Orange, 04: Yellow, 05: Green

Number of Positions	Dimension A	Number of Positions	Dimension A
01	N/A	016	1.875
02	.125	017	2.000
03	.250	018	2.125
04	.375	019	2.250
05	.500	020	2.375
06	.625	021	2.500
07	.750	022	2.625
08	.875	023	2.750
09	1.000	024	2.875
010	1.125	025	3.00
011	1.250	026	3.125
012	1.375	027	3.250
013	1.500	028	3.375
014	1.625	029	3.500
015	1.750	030	3.625

A convenient, inexpensive hand tool (model #1040) is available to facilitate placement of TP-104 test points during assembly operations.

SPECIFICATIONS:

Mounting: .063" Dia. Hole
Material: .015" x .032" Brass, 260 Alloy, Electro-tin Finish
Collar: 30% Glass Filled Nylon



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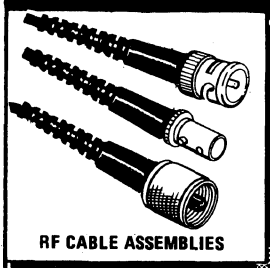
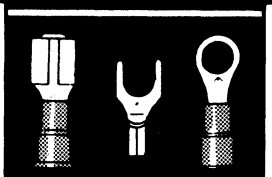
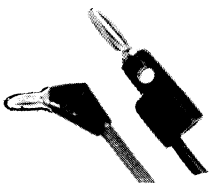
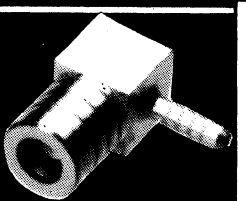
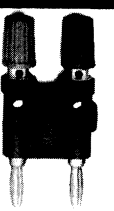

RF CABLE ASSEMBLIES

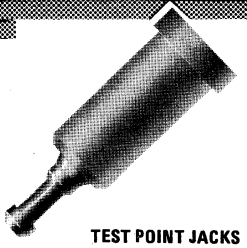

SOLDERLESS LUGS & TERMINALS


JUMPERS & PATCH CORDS

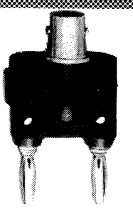

RF CONNECTORS


BINDING POST TO DOUBLE BANANA PLUG

KNOBS

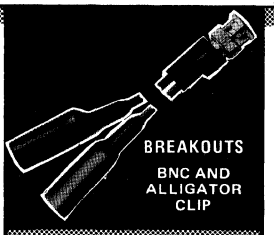

TEST POINT JACKS

PANEL JACKS


BNC FEMALE TO BANANA PLUGS

P.C. PINS

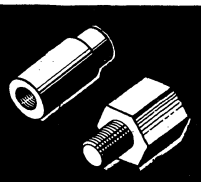
FLUTED BINDING POSTS

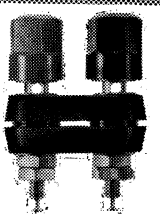

BREAKOUTS
BNC AND ALLIGATOR CLIP

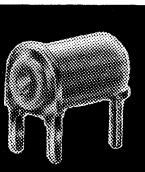
TEST ACCESSORIES

SHORTING PLUGS

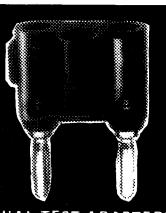
OSCILLOSCOPE PROBES

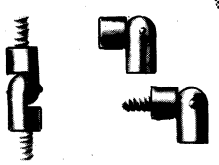

SPACERS & STANDOFFS


DUAL BINDING POSTS


90° NYLON P.C. JACK

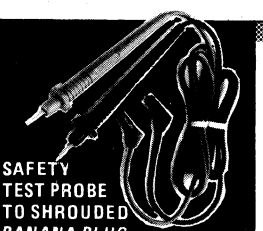
MIL-C-39024 JACKS

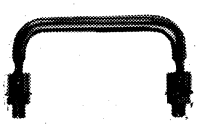

DUAL TEST ADAPTERS


HINGED STANDOFFS

TEFLON* PANEL JACKS

SAFETY HOOK TEST CLIPS


SAFETY TEST PROBE TO SHROUDED BANANA PLUG


HANDLES

Teflon® is Du Pont's registered trademark

THE MANUFACTURER'S MANUFACTURER

CONCORD®

THE DEPENDABLE COMPONENT SOURCE

30 GREAT JONES ST., NEW YORK, N.Y. 10012 (212) 777-6571 • TWX 710-581-4930 • FAX 1-212-995-0161

SELF-ADHESIVE **BUMPERS** MECHANICAL

GASKETDYNAMICS

GD1

GD2

GD3

GD4

GD5

GD6

GD10

GD11

GD15

GD17

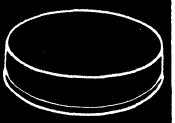
GD18

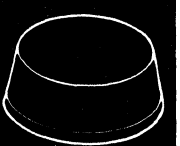
Self-Adhesive Bumpers

PRODUCT Style No.	3M No.	Minimum Case Qty.	Size	Description
GD-1	SJ5012	4,000	ht. .14"/3.5mm dia. .50"/12.7mm	Cylindrical
GD-2	SJ5003	5,000	ht. .20"/5.0mm dia. .45"/11.1mm	Hemisphere
GD-3	SJ5018	4,000	ht. .20"/5.6mm dia. .50"/12.7mm	Square
GD-4		5,000	ht. .34"/8.6mm dia. .75"/19.1mm	Square
GD-5		4,000	ht. .06"/1.6mm dia. .50"/12.7mm	Cylindrical
GD-6		5,000	ht. .250"/5.1mm dia. .50"/12.7mm	Cylindrical
GD-10		4,000	ht. .26"/6.6mm dia. .50"/12.7mm	Square
GD-11		3,000	ht. .40"/10.2mm dia. .62"/15.9mm	Cylindrical
GD-15	SJ5027	3,000	ht. .32"/7.9mm dia. .63"/16.0mm	Hemisphere
GD-17	SJ5009	5,000	ht. .40"/10.1mm dia. .88"/22.3mm	Circular Depressed
GD-18		4,000	ht. .14"/3.5mm dia. .50"/12.7mm	Cylindrical Concavity
GD-19	SJ5023	3,000	ht. .30"/7.6mm dia. .81"/20.6mm	Tapered Sq.
GD-22		5,000	ht. .125"/3.1mm dia. .625"/15.9mm	Square
GD-24		5,000	ht. .125"/3.1mm dia. .810"/20.5mm	Cylindrical
GD-25		5,000	ht. .250"/6.2mm dia. .810"/20.5mm	Cylindrical
GD-26		5,000	ht. .090"/2.4mm dia. .50"/12.7mm	Cylindrical
GD-29		5,000	ht. .325"/7.9mm dia. .50"/12.7mm	Cylindrical
GD-30	SJ5532	1,000	ht. .66"/16.7mm dia. 1.88"/47.7mm	Circular Depressed
GD-31		5,000	ht. .117"/2.9mm dia. .50"/12.7mm	Cylindrical
GD-32	SJ5008	5,000	ht. .12"/3.1mm dia. .50"/12.7mm	Tapered Square
GD-33		5,000	ht. .188"/4.8mm dia. .375"/9.5mm	Square
GD-34		4,000	ht. .125"/3.2mm dia. .625"/15.9mm	Cylindrical

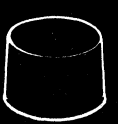
GD19

GD22


GD24


GD25

GD26


GD29

GD30

GD31

GD32

GD33

GD34

Mechanical Bumpers

Recess Bumpers

Generally available from stock in black SBR compound, durometer hardness 70. Other hardness and colors furnished on special orders. All styles also available with metal washers embedded at the base of recess.

Mushroom and Stem Bumpers

Generally available in stock in black SBR compound, durometer hardness 70. Other hardness and colors promptly supplied on special orders.

Plug Bumpers

Generally available in stock in black, white or grey color, natural rubber base compound, durometer hardness 55. Other hardness and colors supplied on special orders.

Tack and Screw Bumpers

Tack bumpers are available from stock in black and white colors. Special colors made to order in quantity runs.

Crutch, Stool and Furniture Tips

All sizes available from stock in black and white color, durometer hardness 60. Other colors and hardness run on special order.

Grommets

Grommets are generally available in stock black natural rubber base compounds, durometer hardness 55. Other compounds, hardness, and colors run on special orders.

Stem Bushings and Spacers

Bushings and spacers are not generally carried in stock due to variations in hardness, polymer, etc. for specialized applications.

Bar Bumpers

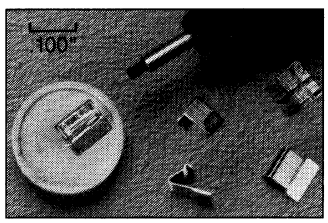
Generally available in stock Duro 70. White Only.

14 King Street • P.O. Box 45 • Mt. Holly, N.J. 08060
609-261-8100 • 215-922-6046 • 800-541-2500
FAX. 609-261-7300

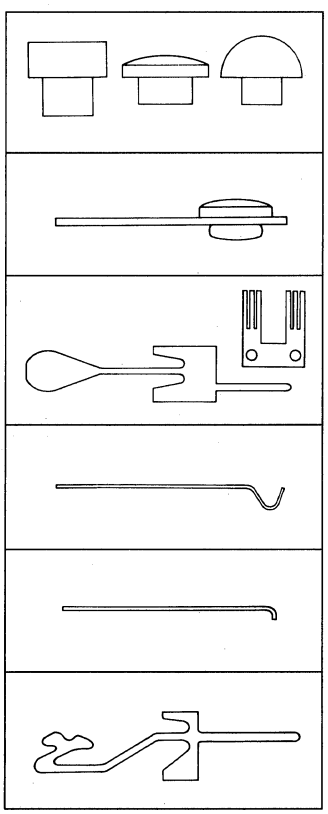
Precise, Reliable, Low-Energy Electrical Contacts

Ney manufactures high quality, precision stampings for demanding low energy (> 1 amp) electrical contacts. Precious metal stampings are a specialty. Our secure facilities and control procedures with expensive alloys have been developed through over 176 years in the precious metal business. Ney manufactures the Paliney® and Neyoro® series of contact alloys from bullion. Non-precious contact alloys are also stamped with ultra-precision.

Job volumes up to 1,000,000 parts are easily handled with automated stamping equipment. Yet, jobs as small as 1,000 parts can be done at reasonable cost. A captive tool and die shop facilitates rapid turnaround on rush jobs, and maximum control over the final product. Ney precision contacts can also be insert molded in the engineering thermoplastic of your choice.



The following are some typical low energy contact designs that Ney manufactures:



Miniature Brush Wipers

Miniature brush wipers can be made in extremely small sizes. This style of contact provides high reliability with low cost by using many points of contact. Up to 30 wires or ribbons can be placed on the busbar with positional reliability, in wire diameters between .0025" and .015". These brushes are designed to withstand vapor phase soldering temperatures.

Rivets

Solid precious metal rivets are an excellent choice for make-and-break contacts with slightly higher amp ratings (1,000 to 2,000 milliamps). These rivets are made with CNC machine or cold-headed accuracy, and can be staked in place in a variety of materials. Head diameters can be as small as .050", and shank diameters as small as .020".

Staked Contacts

Copper spring arms with precious metal rivet contacts, staked in place, provide controlled gram force contact and reliable, bi-directional, low amperage switching. Any number of contacts can be positioned along the spring arm.

Flat Stampings

Paliney® 6 or 7 can be automatically stamped into complex shapes to fit your final design. Orientation features or locking details for insert molding are accurately placed. Contact fingers can be bifurcated for reliability. These high precision stampings are ideal for sliding contact applications below 1,000 milliamps.

Knuckle Contacts

Tight radius contact knuckles provide long life and bi-directional sliding contacts. These can be placed in either flat stamped contacts or in miniature brush wipers. Contact lines can be placed very accurately with knuckle contacts.

Rake Contacts

Rake contacts present the same cross-sectional contact area as the rake wears. This contact style is popular in applications driven by repeatability. It has been especially successful in critical automotive sensor applications.

EDM Contacts

Low volume contacts with extremely complex shapes can be electro-discharge-machined from the proper base metal. For low volume runs, Ney's advanced EDM equipment provides extremely tight control over dimensions and shape. Complex curves and other unique features are easily incorporated in these contact designs.

The J.M. Ney Company is a major manufacturer of precious metal alloys, low energy electrical contacts, test & burn-in sockets and electronic products. Please see our other ads under Services, Molding (Sec. 4100) and Sockets, Test (Sec. 2100).

Since 1812

NEY

The J. M. Ney Company
Electronics Division
Ney Industrial Park, Bloomfield, Connecticut 06002
PHONE: 203/286-6149 • FAX: 203/242-5688

PERMA POWER® sockets PLUS T.M. MULTIPLE OUTLET STRIPS

Safe and convenient power distribution for

auxiliary work stations
assembly line
maintenance and repair
machine shop
test station
drafting bench
quality control center
exhibit booths

Convenient. Perma Power Sockets-Plus™ multiple outlet strips are the quickest, most convenient way to provide electric power when and where it's needed, with convenient control and complete safety. Conventional cube taps and extension cords can result in overloaded circuits and chaotic stacking of plugs into existing wall outlets. Sockets-Plus multiple outlet strips provide orderly power distribution, as well as control and safety.

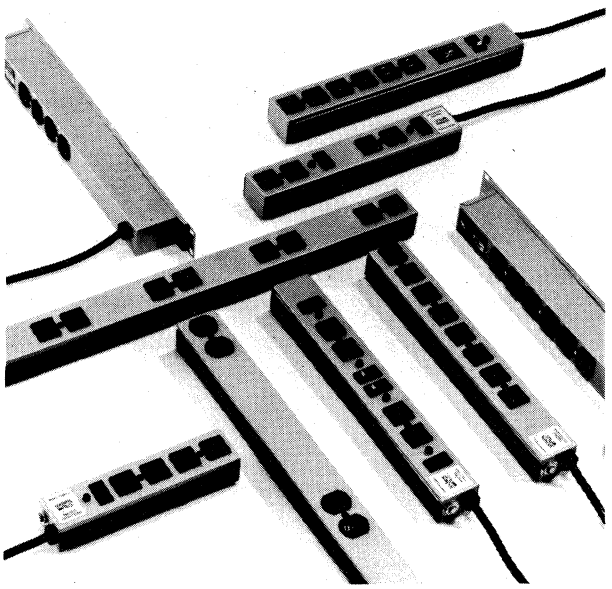
A wide choice of models. Perma Power makes it easy to find the exact strip that's needed. Variables include the number of receptacles, the number of switches and indicator lights, and the length of the cords.

Extra features. On-off switches and indicator lights are extra features that put the user in complete control of his local power use! See at a glance what's on, what's off. Save steps; easily control power to any machine, computer, or lamp with handy on-off switch options.

Safe. All Sockets-Plus multiple outlet strips come with 3-wire U-ground outlets, and are housed in electrically-grounded steel cases. Because they have built-in circuit breakers, there's no danger of overloading one of the main circuits. If the power drain is too great, they shut off the power *here*, not in a fuse box somewhere down the line. The line is guarded, so users can relax!

Custom designs. Perma Power will provide custom designs, with your choice of colors, finishes, configurations and available features. Just tell us what you need and we'll get back to you promptly with a quote, minimums and delivery schedule.

MULTIPLE OUTLET STRIPS FOR INDUSTRIAL/LABORATORY



GENERAL SPECIFICATIONS
Rugged steel construction, tough silver and black industrial finish—Top is electrostatically painted silver enamel over a zinc phosphate undercoating, resulting in a hard, corrosion-resistant surface. Sides of conventional-length strip models (K case) are zinc chromated and then covered with thick (14 mil) black vinyl panels, providing added protection, plus handsome appearance! Sides of "J" unit long strips are painted black. Rack-mount strips have black or silver front, and silver back.

Easy mounting—All strips are provided with two screws and cross-slots on the bottom for rapid mounting.

Rated 1875 watts at 15 amperes, 125 Volts, 60 Hz continuous duty.

UL LISTED

HIGH ABUSE OUTLET STRIPS WITH HOSPITAL GRADE COMPONENTS

These outlet strips are designed for applications with special safety requirements, or where equipment is exposed to fumes from corrosive chemicals or liquids. Their plugs and receptacles are "Hospital Grade"—verified by Underwriters Laboratories to have passed a series of tortuous tests assuring the user of continuous, safe operation, even in the face of human negligence and corrosive environments.

Plugs and receptacles meet or exceed these "Hospital Grade" UL tests:

Abrupt removal of plug
Ground pin retention
Terminal strength
Assembly security
Face impact
Ground contact
Temperature
Ground contact resistance
Fault current test
Mold stress relief

SPECIFICATIONS FOR PLUGS AND RECEPTACLES
Designated by a green dot—your assurance the components are U.L. Hospital Grade
UL Hospital Grade Standards #498 and #544
Federal Specification WC 596E (8200, 8210, 8300, 8310)
NEMA Standard WD1
NEMA 5-15R and 5-20R
CSA Certified (8200-8210 series only)
Corrosion-resistant per ASTM B-117-73

UL LISTED

SURGE SUPPRESSOR OUTLET STRIPS

Protect your data and equipment from errors and damage caused by power line voltage surges. These surge protected outlet strips guard against both *normal mode* surges (line to neutral) and *common mode* surges (line to ground and neutral to ground). Each comes with a master on-off switch, indicator light, 15 amp circuit breaker, and 6 ft. power cord.

These Perma Power Surge Suppressors feature a unique failsafe Automatic Shutdown mechanism* to insure that your valuable electronic equipment is always protected. All power is stopped if the surge suppression circuitry wears or burns out. A visual indication of shutdown is provided by the pilot lamp.

There are two model groups: The single-stage models feature filtering provided by three metal oxide varistors. These models provide protection on all three conductors in a typical 120VAC circuit. The Extended Life group features four-element two-stage filtering, provided by a uniquely-engineered combination of metal oxide varistors and silicon avalanche diodes. These models assure you of protection against both powerful surges and repeated surges, and provide lower let-through voltage and longer operating life.

*(Patent No. 4,578,579)

UL LISTED

	Perma Power Surge Suppressors	Extended Life Surge Suppressors
Clamping Threshold (Nominal)	250 Volts	225 Volts
Let-Through Voltage	600 Volts	400 Volts
Response Time	5 nanoseconds	5 picoseconds

Manufactured in U.S.A. by PERMA POWER® Electronics inc. **5601 West Howard Avenue • Chicago, Illinois 60648 • 312/647-9414**

PERMA POWER® sockets PLUS T.M. MULTIPLE OUTLET STRIPS

MULTIPLE OUTLET STRIPS

6 Ft. Cord Model No.	12 Ft. Cord Model No.	Number of Outlets	Master Switch & Indicator Light	Switched Outlet Pairs with Indicator Light	Individually Switched Outlets with Indicator Light	"Live" Outlet (For clock, etc.)	Case Length (inches)
INDUSTRIAL MODEL SELECTOR CHART							
K400	K402	4	—	—	—	—	9
K410	K412	4	1	—	—	—	9
K420	K422	4	—	2	—	—	12
K440	K442	4	—	—	4	—	15
K510	K512	5	1	—	—	1	12
K520	K522	5	—	2	—	1	12
K540	K542	5	—	—	4	1	15
K600	K602	6	—	—	—	—	12
K610	K612	6	1	—	—	—	12
K630	K632	6	—	3	—	—	15
K710	K712	7	1	—	—	1	15
K800	K802	8	—	—	—	—	15
K810	K812	8	1	—	—	—	15
2, 4 & 6 FOOT INDUSTRIAL STRIPS							
				Outlet spacing			
J082A011	J082A211	8	1	3 inches between pairs			24
J084A011	J084A211	8	1	9 inches between pairs			48
J164A011	J164A211	16	1	3 inches between pairs			48
J126A011	J126A211	12	1	9 inches between pairs			72
J246A011	J246A211	24	1	3 inches between pairs			72

RACK MOUNT OUTLET STRIPS

SPECIFICATIONS FOR RACK MOUNT UNITS

All models have 6 outlets; all on front, or all on back, or 2 front and 4 back.

Mount in standard 19" cabinet racks. Available in standard width (3½"), and compact width for tight spaces (1¾").

All units have master switch, indicator light, and 15 amp circuit breaker.

Heavy duty, 22 gauge metal construction. Black or silver painted front, silver back. U-ground outlets with electrically-wired ground; phosphor bronze, dual wiping contacts.

Recognized under the component program of Underwriters Laboratories.

RECOGNIZED

6 ft. cord Model No. Silver	6 ft. cord Model No. Black	12 ft. cord Model No. Silver	12 ft. cord Model No. Black	Outlets Front	Outlets Back	Front Panel Height 'A'	Mounting Centers 'B'
RACK MOUNT STRIPS							
J06AOS	J06AOB	J06A2S	J06A2B	0	6	3½"	3"
J06BOS	J06BOB	J06B2S	J06B2B	0	6	1¾"	1¼"
J24AOS	J24AOB	J24A2S	J24A2B	2	4	3½"	3"
J24BOS	J24BOB	J24B2S	J24B2B	2	4	1¾"	1¼"
J60AOS	J60AOB	J60A2S	J60A2B	6	0	3½"	3"
J60BOS	J60BOB	J60B2S	J60B2B	6	0	1¾"	1¼"

FOR INDUSTRIAL/SCIENTIFIC/MEDICAL APPLICATIONS

Model No.	Number of Outlets	Master Switch & Indicator Light	Outlet Spacing (Inches)	Case Length (Inches)
HIGH ABUSE STRIPS				
K410H	4	1	—	9
K610H	6	1	—	12
J084A011H	8	1	9	48
J126A011H	12	1	9	72

Model No.	Number of Outlets Front	Number of Outlets Back	Master Switch & Indicator Light	Front Panel Height "A" (Inches)	Mounting Centers "B" (Inches)
HIGH ABUSE RACK MOUNT STRIPS					
J24AOS	2	4	1	3½	3
J24BOSH	2	4	1	1¾	1¼
J06AOSH	0	6	1	3½	3
J06BOSH	0	6	1	1¾	1¼

SURGE SUPPRESSOR OUTLET STRIPS

Model No.	Number of Outlets	Protection	Case Length	Warranty
PERMA POWER SURGE SUPPRESSORS				
KT410	4	Single Stage	12"	1 yr
KT610	6	Single Stage	15"	1 yr
KS410	4	Extended Life	12"	5 yrs
KS610	6	Extended Life	15"	5 yrs

Model No.	Outlets Front	Outlets Back	Protection	Front Panel Height 'A'	Mounting Centers 'B'	Warranty
RACK MOUNT SURGE SUPPRESOR						
JT06B0B	0	6	Single Stage	1¾"	1¼"	1 year
JT06B2B*	0	6	Single Stage	1¾"	1¼"	1 year
JS06B0B	0	6	Extended Life	1¾"	1¼"	5 years
JS06B2B*	0	6	Extended Life	1¾"	1¼"	5 years

*12 ft. power cord

Manufactured in U.S.A. by PERMA POWER® Electronics inc. **5601 West Howard Avenue • Chicago, Illinois 60648 • 312/647-941**

COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

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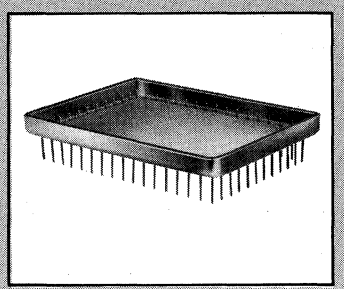
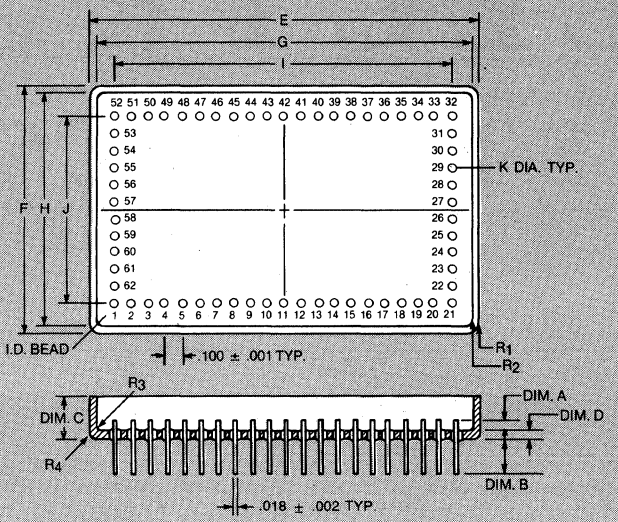
HERMETIC SEALS

DRAWN TUB PLUG-INS
KOVAR OR CRS MATERIAL





R-H PART NUMBER	NO. PINS[a]	PIN LOCATION	A[b]	B[b]	C[b]	D	E	F	G	H	I	J	K	R_1	R_2	R_3	R_4
04-19526-000	18	(7+7)I / (2+2)J	.050	.250	.140	.040	.795	.470	.715	.390	.600	.300	.047	.060	.020	.010	.050
04-21124-000	18	(7+7)I / (2+2)J	.050	.250	.200	.040	.820	.490	.740	.410	.600	.300	.047	.060	.020	.010	.050
04-20517-000	20	(8+8)I / (2+2)J	.050	.250	.200	.040	.895	.495	.815	.415	.700	.300	.047	.060	.020	.010	.050
41-21081-000	10	(5+5)I	.050	.250	.200	.040	.625	.625	.545	.545	.400	.400	.047	.060	.020	.020	.050
04-19758-000	22	(9+9)I / (2+2)J	.050	.250	.200	.040	.998	.490	.918	.410	.800	.300	.047	.060	.020	.010	.050
04-20929-000	24	(7+7)I / (5+5)J	.050	.250	.200	.040	.750	.750	.670	.670	.600	.600	.047	.060	.020	.010	.050
04-19544-000	32	(9+9)I / (7+7)J	.050	.250	.200	.040	.995	.995	.915	.915	.800	.800	.047	.060	.020	.010	.050
04-19549-000	34	(12+12)I / (5+5)J	.050	.250	.385	.040	1.270	.770	1.190	.690	1.100	.600	.047	.060	.020	.020	.060
04-19550-000	46	(18+18)I / (5+5)J	.050	.250	.200	.040	1.895	.775	1.815	.695	1.700	.600	.047	.060	.020	.020	.050
04-19536-000	30	(10+10)I / (5+5)J	.050	.250	.170	.040	1.140	.936	1.060	.856	.900	.600	.047	.155	.115	.010	.050
04-19760-000	38	(12+12)I / (7+7)J	.050	.250	.185	.040	1.270	.970	1.190	.890	1.100	.800	.047	.060	.020	.020	.050
04-21235-000	42	(16+16)I / (5+5)J	.050	.250	.210	.040	1.695	.775	1.615	.695	1.500	.600	.047	.060	.020	.010	.050
04-19566-000	52	(19+19)I / (7+7)J	.050	.250	.220	.040	1.990	.990	1.910	.910	1.800	.800	.047	.080	.040	.020	.080
04-21076-000	52	(19+19)I / (7+7)J	.050	.250	.200	.040	1.990	.990	1.910	.910	1.800	.800	.056	.060	.020	.020	.080
04-19651-000	44	(12+12)I / (10+10)J	.050	.250	.200	.040	1.250	1.250	1.170	1.170	1.100	1.100	.047	.060	.020	.010	.050
04-20745-000	50	(18+18)I / (7+7)J	.050	.250	.230	.040	1.925	1.036	1.845	.956	1.700	.800	.047	.060	.020	.020	.060
04-19515-000	48	(16+16)I / (8+8)J	.050	.250	.260	.040	1.740	1.140	1.660	1.060	1.500	.900	.056	.060	.020	.010	.050
04-20833-000	64	(16+16+16+16)I	.050	.250	.225	.040/.045	1.760	1.245	1.680	1.162	note c	1.050	.050	.055	.020	.010	.050
04-19574-000	54	(17+17)I / (10+10)J	.050	.250	.170	.040	1.830	1.330	1.750	1.250	1.600	1.100	.056	.086	.046	.020	.050
04-21216-000	56	(15+15)I / (13+13)J	.050	.250	.200	.040	1.600	1.600	1.520	1.520	1.400	1.400	.047	.060	.020	.020	.060
04-19761-000	56	(20+20)I / (8+8)J	.050	.250	.385	.040	2.140	1.140	2.060	1.060	1.900	.900	.056	.060	.020	.010	.050
04-19537-000	62	(21+21)I / (10+10)J	.050	.250	.215	.050	2.300	1.400	2.200	1.300	2.000	1.100	.056	.090	.040	.010	.060
04-20850-000	62	(21+21)I / (10+10)J	.050	.250	.200	.040	2.300	1.400	2.220	1.320	2.000	1.100	.056	.060	.020	.010	.050

NOTES:

a. Packages available with any quantity of leads less than maximum listed.
b. Consult factory for other dimensions.
c. Special lead configuration—consult factory.

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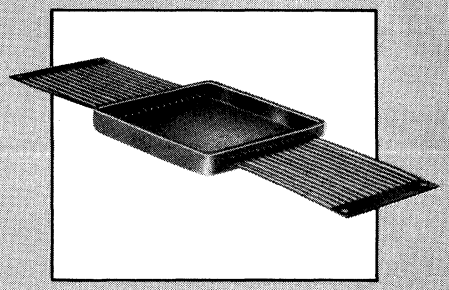
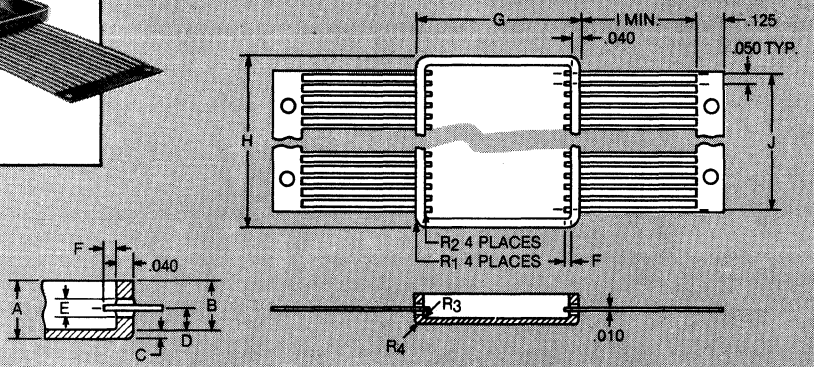
HERMETIC SEALS

FLATPACKS[d]
KOVAR MATERIAL





R-H PART NUMBER	NO. LEAD[e]	A[f]	B[f]	C[f]	D[f]	E	F[f]	G	H	Imin.	Jmax.	R_1	R_2	R_3	R_4
04-20921-000[g]	14	.105	.085	.020	.030	.033	.035	.250	.380	.750	.300	.020	.020	.010	.040
04-20877-000[g]	14	.105	.085	.020	.030	.033	.035	.380	.384	.750	.300	.020	.020	.010	.050
04-21061-000[g]	14	.200	.180	.020	.040	.033	.035	.275	.410	.750	.300	.020	.020	.010	.050
04-20932-000[g]	16	.200	.180	.020	.032/.045	.033	.035	.375	.500	.750	.350	.020	.020	.010	.050
04-20990-000[g]	22	.200	.180	.020	.030	.033	.035	.375	.625	.750	.500	.020	.020	.010	.050
04-20812-000[g]	22	.225	.205	.020	.030	.033	.035	.375	.625	.750	.500	.020	.020	.010	.050
04-20969-000	32	.200	.180	.020	.050	.033	.035	.500	.500	.750	.350	.020	.020	.010	.050
04-20897-000[g]	32	.200	.180	.020	.047	.033	.035	.500	.500	.750	.350	.020	.020	.010	.050
04-20972-000	40	.200	.180	.020	.045	.040	.035	.625	.625	.750	.450	.020	.020	.010	.040
04-19501-000	22	.200	.180	.020	.050/.095	.040	.035	.625	.625	.750	.500	.060	.020	.010	.050
04-20892-000	52	.200	.180	.020	.045/.062	.040	.035	.750	.750	.750	.600	.020	.020	.010	.050
04-21256-000	30	.145	.125	.020	.040	.040	.035	.580	.850	.750	.700	.055	.020	.010	.050
04-21257-000	32	.135	.115	.020	.062	.040	.035	1.000	.750	.750	.750	.020	.020	.010	.050
04-20931-000	68	.200	.180	.020	.052	.040	.035	1.000	1.000	.750	.800	.020	.020	.010	.050
04-20039-000	64	.200	.180	.020	.052	.040	.035	1.000	1.000	.750	.750	.060	.020	.010	.050
04-19691-000	80	.220	.200	.020	.037	.040	.035	1.180	1.180	.750	.950	.060	.020	.010	.050
04-20381-000	92	.200	.180	.020	.052	.040	.035	1.250	1.250	.750	1.100	.060	.020	.010	.050
04-21258-000	64	.260	.240	.020	.050	.040	.035	1.215	1.715	.750	1.550	.020	.020	.010	.050
04-20040-000	64	.215	.195	.020	.037/.065	.040	.035	1.215	1.715	.750	1.550	.060	.020	.010	.050
04-20920-000	64	.260	.240	.020	.055	.040	.035	1.215	1.715	.750	1.550	.020	.020	.010	.050
04-20380-000	74	.200	.180	.020	.062	.040	.035	1.000	2.000	.750	1.800	.020	.020	.010	.050
04-20894-000	34	.200	.180	.020	.052	.040	.035	1.330	1.830	.750	1.600	.086	.046	.020	.050

NOTES:

d. All Flatpacks available as 1-piece drawn tub style. Certain sizes also available as 2-piece brazed style construction. Consult factory.
e. Packages available with any quantity of leads less than maximum listed.
f. Consult factory for other dimensions.
g. This package has non-standard wall thickness. Consult factory for other details.

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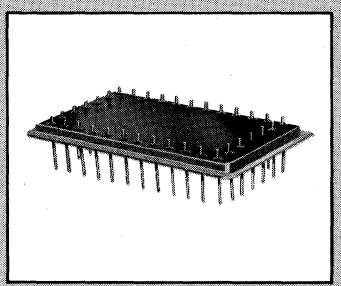
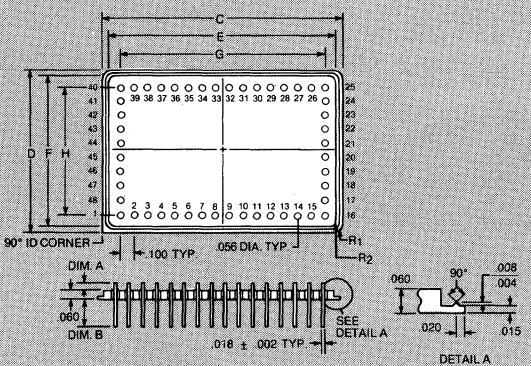
HERMETIC SEALS
Platforms—Kovar or CRS Material

RESISTANCE WELD OR SOLDER SEAL

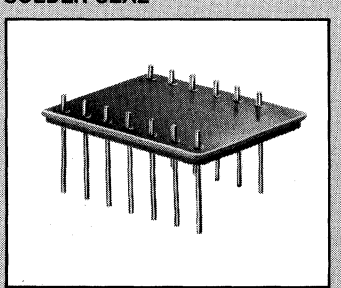


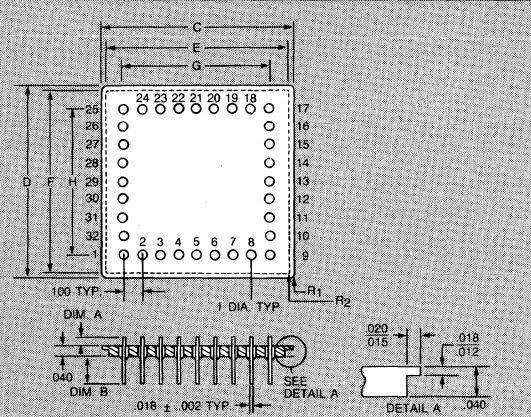


R-H PART NUMBER	NO. PINS[h]	PIN LOCATION	A[i]	B[i]	C	D	E	F	G	H	R_1	R_2	90°ID
04-20001-000	14	(7+7)G	.050	.250	.798	.497	.698	.397	.600	.300	.080	.030	YES
04-19538-000	14	(7+7)G	.050	.250	.870	.498	.770	.398	.600	.300	.080	.030	YES
04-19650-000	16	(8+8)G	.050	.250	.970	.498	.870	.398	.700	.300	.080	.030	YES
04-19759-000	22	(9+9)G / (2+2)H	.050	.250	1.070	.498	.970	.398	.800	.300	.080	.030	YES
04-19540-000	26	(8+8)G / (5+5)H	.050	.250	.970	.795	.870	.695	.700	.600	.080	.030	YES
04-19571-000	34	(12+12)G / (5+5)H	.050	.250	1.370	.795	1.270	.695	1.100	.600	.080	.030	YES
04-19529-000	32	(14+14)G / (2+2)H	.050	.250	1.560	.525	1.470	.435	1.300	.300	.080	.035	YES
04-19872-000	42	(14+14)G / (7+7)H	.050	.250	1.500	1.000	1.400	.900	1.300	.800	.085	.035	YES
04-19873-000	48	(16+16)G / (8+8)H	.050	.250	1.740	1.140	1.640	1.040	1.500	.900	.155	.105	NO

NOTES:
h. Packages available with any quantity of leads less than maximum listed.
i. Consult factory for other dimensions.

REVERSE FLANGE SOLDER SEAL





R-H PART NUMBER	NO. PINS	PIN LOCATION	A[k]	B[k]	C	D	E	F	G	H	I	R_1	R_2	90°ID
04-19522-000	14	(7+7)G	.050	.250	.740	.540	.700	.500	.800	.400	.047	.045	.045	NO
04-20884-000	32	(9+9)G / (7+7)H	.050	.250	1.040	1.040	1.000	1.000	.800	.800	.060	.045	.043	NO

NOTES:
j. Packages available with any quantity of leads less than maximum listed.
k. Consult factory for other dimensions.

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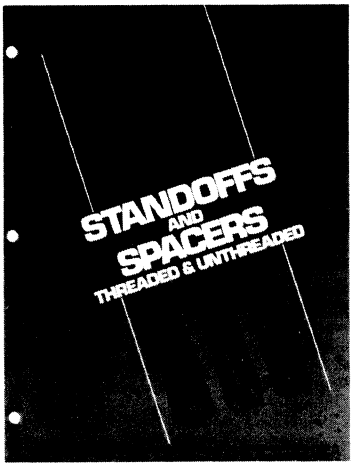
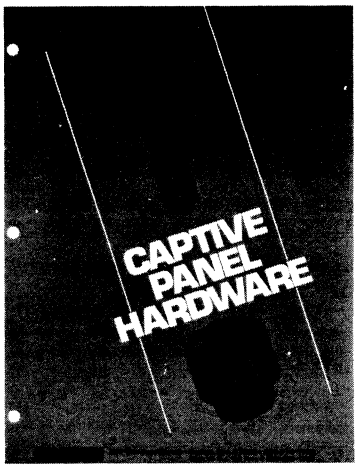
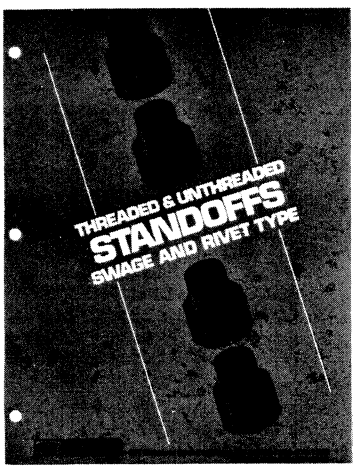


CATALOG H-1B

CATALOG H-2B



CATALOG H-3



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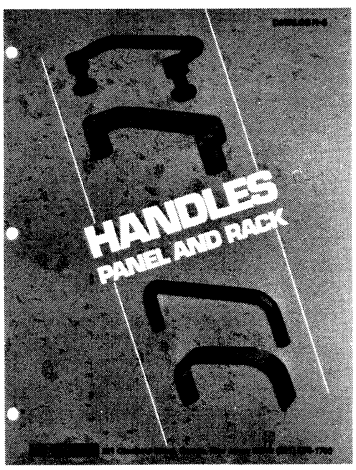

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CATALOG H-7

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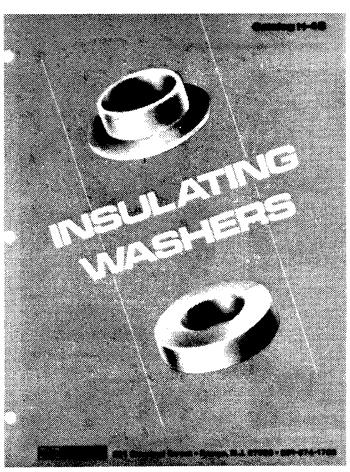
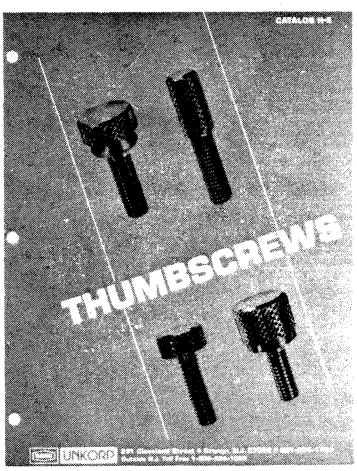


CATALOG H-4S



CATALOG H-5

UNICORP

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FANS & BLOWERS

Manufacturer	Starting EEM Page No.	Model/ Series	AC	DC	Type		Noise dB	Capacity (CFM)				Variable Speed Control
					Fan	Blower		1-49	50-99	100-499	500 & up	
Amco Engineering Co.	C•1640	BH, BD, BRD				√				√	√	√
		BTA Series			√			√	√	√	√	√
Delta Products Corp.	C•1642	60MM		14	√		Min.	√				
				24								
		80MM		12/24	√		Min.	√				
		92MM		12/24	√		Min.		√			
		120MM		12/24	√		Min.		√			
EBM Industries Inc.	C•1644		√			√		√	√	√		Single Inlet
			√			√				√	√	Dual Inlet
			√			√				√	√	Cross Flow
		W2S Series	√	√	√				√	√	√	√
Etri Inc.	C•1654	98	√		√		21 - 37	√	√			
		99	√		√		19 - 33	√				
		113	√		√		35		√			
		125	√		√		29-40		√	√		
		126	√		√		9 - 26	√				
		141	√		√		23-41	√	√	√		
		146	√		√		23	√				
		148	√		√		33			√		
Hi - Tech Inc	C•1659	320	√	√	√		45	√	√	√		
		318	√	√	√		45	√	√			
		330-343	√	√		√	50	√	√	√		
		351	√	√		√	30	√				
		352, 353, 354	√	√		√	30	√	√			
		357	√	√		√	30	√	√	√		
		358, 360	√	√		√	35	√	√	√		
		367	√	√		√	35	√	√	√	√	
		369, 375, 379	√	√		√	45			√	√	
		380, 381	√	√		√	50			√	√	
Howard Industries Inc.	C•1660		√	√	√			√	√	√	√	√
			√	√		√						√
Indek Corp.	C•1664	HDF3020		√	√		19-24	√				
		HDF4020		√	√		21-26	√				
		HDF6025L		√	√		21-41	√				
		HDF8025L		√	√		27-41	√				
		HDF9225L		√	√		32-42		√			
		HDF1225L		√	√		36-52		√			
		EP 0825L	√		√		29-33	√				
		EP 0925T	√		√		35-39	√				
		EP1238T	√		√		38-49		√			
Interfan	C•1670	P0003		√	√		30	√				
		P0005		√	√		35	√				
		P0012		√	√		36	√				
		P0014		√	√		30	√				
		P0020		√	√		33	√				
		P0022		√	√		32	√				
		P0025		√	√		35	√				
		P0034		√	√		33	√				
		P0035		√	√		39	√				
		P0040		√	√		38	√				
		P0053		√	√		37		√			
		PM082		√	√		45		√			
		PM106		√	√		47			√		
		PM018	√		√		33	√				
		PM024	√		√		36	√				
		MM032	√		√		40	√				
		PM032	√		√		36	√				
		PM040	√		√		36	√				
		PM058	√		√		39		√			
		PM060	√		√		38		√			
		PM074	√		√		43		√			
		MM106	√		√		44			√		
		PM106	√		√		46			√		
		MM235	√		√		53			√		
		PMB24	√			√	53	√				

FANS & BLOWERS

Manufacturer	Starting EEM Page No.	Model/ Series	AC	DC	Type		Noise dB	Capacity (CFM)				Variable Speed Control
					Fan	Blower		1-49	50-99	100-499	500 & up	
McLean Engineering	C•1674	Card coolers			√	√				√	√	√
		Packaged blowers	√	√	√	√			√	√	√	
		Centrifugal Fans	√	√	√			√	√	√ √	√ √	
Micronel U.S.	C•1678	V300	√			√	14	√				
		V460	√			√	15	√				
		V570	√			√	16	√				
		V600	√			√	22	√				
		V72	√			√	32	√				
		V240		√		√	40	√				√
		V300		√		√	41	√				√
		V360		√		√	45	√				√
		V460		√		√	28	√				√
		V570		√		√	27	√				√
		V600		√		√	60		√			√
		L39		√	√		25	√				
		F57		√	√		22-38	√				
		F80		√	√		23-42	√				
NMB Technologies	C•1680	Various	√	√	√		Low	√	√	√		
		240 NL Series		√	√		Low	√	√			√
Oriental Motors USA	C•1682	MR Series	√		√					√		
		MU Series	√		√			√	√	√		
		MD Series	√	√	√			√	√	√		
Papst Mechatronic	C•1683	800		√	√		Low	√				
		8300		√	√		Low	√				
		3300		√	√		Low	√	√			
		4300		√	√		Low	√	√	√		
		2500	√		√		Low	√	√	√		
		4600	√		√		Low	√	√	√		
		4800	√		√		Low	√	√			
		7600	√		√		Low	√	√	√		
		8500	√		√		Low	√				
		8800	√		√		Low	√				
		900	√		√		Low	√				
		6008	√		√		Low	√	√	√		
		RL90-18	√			√	Low	√				
		812		√	√		Low	√				
		3124F		√	√		Low	√	√			
		4100 Series		√	√		Low	√	√	√		
		6100 Series		√	√		Low	√	√	√		
		8100 Series		√	√		Low	√				
Seattle Aircraft (Mechatronics)	C•1686	2408		√	√		28-35	√				
		2410		√	√		24-37	√				
		3110		√	√		20-38	√	√	√		
		3610		√	√		24-39	√				
		4715		√	√		33-43		√	√	√	
		3115	√		√		31-44	√				
		4715	√		√		28-56	√	√	√		
U.S. Toyo Fan Corp.	C•1694	TF120	√		√		35			√		
		TFDD120		√	√		39			√		√
		UST120	√		√		38			√		
		TF92	√		√		36	√				
		TFDD92		√	√		28	√				√
		UST92	√		√		35	√				
		TFDD80	√		√		30	√				√
		USTD80		√	√		27	√				√
		TF80	√		√		32	√				

AIR CONDITIONERS, COOLERS, HEAT PUMPS, HEAT SINKS

Manufacturer	Starting EEM Page No.	Type of System	Model/Series	Capacity Cooling (BTU/ hr.)	Features/Applications
Aavid Engineering	C•1634	Heat sinks			Semiconductor cooling
Cambridge Aeroflo	C•1641	Sensors Switch Motors & speed Controls & drivers Cooling			Air flow & temperature Mass flow & temperature Management systems
EBM Industries Inc.	C•1644	Closed loop	416, 455 Series	1200 - 10000	Filterless
EG & G Wakefield Engrg.	C•1651	Heat sinks Heat exchangers Cold plates			Semiconductor thermal management for computer systems & electronics
Electro-Impulse	C•1652	Heat exchanger Closed loop	RU Series CU Series		Cooling, Refrigerated Cooling, Non-refrigerated Cooling, MIL
IERC	C•1661	Heat sinks			Cooling semiconductors
Marlow Industries Inc.	C•1672	Thermoelectric coolers (Heat pumps)	MI Series		Solid state cooling
McLean Midwest	C•1676	Air conditioners Heat exchangers	Slimboy Hiboy Loboy HE HX	1200 - 12000 2000 - 6000 2000-7000	Closed - loop design Closed - loop design Closed - loop design Modified heat-pipe core Convoluted aluminum core
Thermalloy	C•1689	Heat sinks	250 Shapes plus custom		
TECA	C•1690	Thermoelectric	AHP1700 LHP1700 AHP1200X AHP301	1100 1500 600 200	Largest, for computers Liquid cooled Outdoor, hostile environment Lab, Medical

SYMBOLS USED BY INTERNATIONAL REGULATORY AGENCIES

These symbols appear on many electrical/electronic components distributed in the world market. They indicate that a country's standard-setting agency has approved the design of the component and/or a testing agency has approved the performance of the component in meeting the standard. This page lists only those countries that have a *symbol* to represent their authority.

Argentina (IRAM) Instituto Argentino de Racionalization de Materiales

Australia (SAA) Standards Association of Australia

Austria (ÖVE) Öesterreichischer Verband für Elektrotechnik

Belgium (CEB) Comité Electrotechnique Belge

Brazil (ABNT) Associação Brasileira de Normas Teonicas

Canada (CSA) Canadian Standards Association

Czechoslovakia Urad pro Normalizaci a Mereni (Office for Standards and Measurements)

Denmark (DEK) Dansk Elektroteknisk Komite (Danish Electrotechnical Committee)

Egypt (EOS) Egyptian Organization for Standardization and Quality Control

Finland (SETI) Electrical Inspectorate

France (UTE) Union Technique de l'Électricité

Germany, Democratic Republic of (East) (ASMW) Amt für Standardi-sierung Messwesen und Warenprufung (Office for Standardization, Metrology and Quality Control)

Germany, Federal Republic of (West) (DKE) Deutsche Electrotechnische Kommission im DIN und VDE (German Electrotechnical Commission of DIN and VDE)

Greece (ELOT) The Hellenic Organization of Standardization

Hong Kong Hong Kong Standards & Testing Centre

Hungary (MSZH) Magyar Szabvanyugi Hivatal (Hungarian Office for Standardization)

India (ISI) Indian Standards Institute "Manak Bhavan"

Indonesia Badan Kerjasama Standardisasi LIPI-YDNI (LIPI-YDNI Joint Standardization Committee)

Iran Institute of Standards and Industrial Research of Iran

Ireland (IIRS) Institute for Industrial Research and Standards

Israel (SII) Standards Institution of Israel

Italy (CEI) Comitato Elettrotecnico Italiano (Italian Electrotechnical Committee)

Japan (JISC) Japanese Industrial Standards Committee Agency of Industrial Science and Technology

Korea, Republic of (South) Industrial Advance Administration

Mexico (DGN) Dirección General de Normas Secretaria de Patrimonio y Fomento Industrial Puente de Tecamachalco

Netherlands (NEC) Nederlands Elektrotechnisch Comite

New Zealand (SANZ) Standards Association of New Zealand

Norway (NEK) Norsk Elektroteknisk Komite (Norwegian Electrotechnical Committee)

Pakistan Pakistan Standards Institution

Poland Polski Komitet Normalizacji Miar i Jakosci (Polish Committee for Standardization, Measures and Quality Control)

Portugal (CEP) Comissão Electrotécnica Portuguesa

Romania Institutul Roman de Standardizare (Romanian Standards Institute)

Singapore Singapore Institute of Standards and Industrial Research

South Africa (SABS) South African Bureau of Standards

Spain (IRANOR) Instituto Nacional de Racionalización y Normalización

Sweden (SEK) Svenska Elektriska Kommissionen (Swedish Electrotechnical Commission)

Switzerland (SEV) Schweizerischer Elektrotechnischer Verein Postfach

Turkey (TSE) Turk Standardlari Enstitusu (Turkish Standards Institution)

United Kingdom (BSI) British Standards Institution

United States (ANSI) American National Standards Institute

United States (NEMA) National Electrical Manufacturers Association

Venezuela CODELECTRA en Conjunto con COVENIN Avda. Ppal.

Yugoslavia Federal Institute of Standardization

HEAT SINKS for TO-3 and TO-66

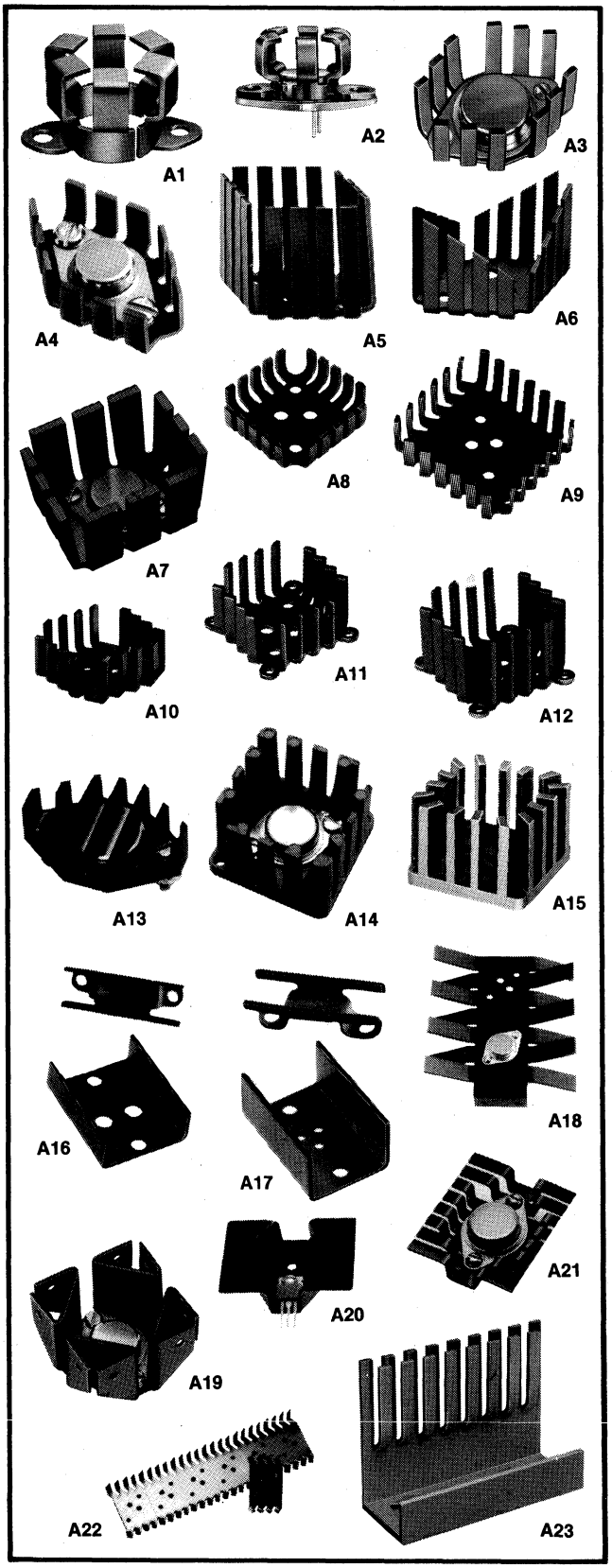

Fig. No.	Description	Model No.†	Height Inches	Thermal Resist. @ Typical Load
A1	Collar expands to slip over TO-3. Minimum footprint.*	5791	.870	@ 3 W = 14.6°C/W
A2	Collar expands to slip over TO-66. Minimum footprint.**	5792	.540	@ 2 W = 22.5°C/W
A3	Low-cost space saver. Unique slanted fins increase air turbulence.	5756 5757 5758 5759	.500 .750 1.00 1.25	@ 3 W = 17.0°C/W @ 4 W = 14.0°C/W @ 5 W = 11.0°C/W @ 6 W = 9.33°C/W
A4	Diamond-shape cooler. Very small footprint.**	5017 5018 5019 5020	.500 .750 1.00 1.25	@ 4 W = 13.0°C/W @ 5 W = 10.4°C/W @ 6 W = 8.50°C/W @ 7 W = 7.00°C/W
A5	Diamond-shape cooler. Space saving, low cost.*	5013 5014 5015 5016	.500 .750 1.00 1.25	@ 4 W = 12.5°C/W @ 5 W = 10.0°C/W @ 6 W = 8.00°C/W @ 7 W = 7.00°C/W
A6	Cost saving, uses 1/3 less metal than series 5013-16.*	5039 5040	1.00 1.25	@ 5 W = 11.0°C/W @ 6 W = 8.50°C/W
A7	Heavy-duty space savers. 1/8″ thick alum. Cost saving over castings. Mounted with device using same hardware.	5197 5198 5199 5201	1.50 1.75 2.00 1.225	@ 10 W = 4.80°C/W @ 12.5 W = 4.40°C/W @ 15 W = 4.10°C/W @ 9 W = 5.70°C/W
A8	Low cost, high performance. Normally supplied in .093″ thick metal. Can furnish in .062″ at lower cost. Other hole patterns available.	5251 5252 5253 5254	.500 .750 1.00 1.25	@ 5 W = 10.0°C/W @ 7 W = 7.40°C/W @ 8 W = 6.50°C/W @ 10 W = 5.10°C/W
A9	Holds up to four devices. Efficient slanted vane fins.	5005 5006	.900 1.00	@ 14 W = 3.80°C/W @ 18 W = 2.70°C/W
A10	Maximum performance. Slanted vane fins for efficient heat dissipation, as much as more costly extrusions, castings.	5761 5762 5763 5764	.500 .750 1.00 1.25	@ 6 W = 8.30°C/W @ 8 W = 6.50°C/W @ 9 W = 5.70°C/W @ 10 W = 5.00°C/W
A11 A12	Dissipates as much as heavier castings, extrusions. Air movement diverted to center to create turbulence.	5001 5002 5003 5004	.500 .750 1.00 1.25	@ 6 W = 8.30°C/W @ 8 W = 6.50°C/W @ 9 W = 5.70°C/W @ 10 W = 5.00°C/W
A13	Space saving. Clamps over device using virtually no additional board space.*	5423 5426 5427	.500 .750 1.00	@ 3 W = 16.0°C/W @ 4 W = 13.0°C/W @ 5 W = 11.0°C/W
A14	Heavy duty. Ideal if space is limited. Provides free circulation of air from all sides. 4 heights.*** With Ther-O-Coat dielectric finish.	5000	.500 .750 1.00 1.25	@ 5 W = 10.0°C/W @ 7.5 W = 6.90°C/W @ 10 W = 5.60°C/W @ 12.5 W = 4.60°C/W
A15	Maximum natural convection cooling per unit volume. 1.50″ between centers of corner holes. 5 heights.*** Base size of 1.81″ x 1.81″.*	5680	.500 .750 1.00 1.25 1.50	@ 5 W = 10.0°C/W @ 7 W = 8.00°C/W @ 8 W = 6.50°C/W @ 9 W = 5.70°C/W @ 10 W = 4.90°C/W
A16	Two-piece heat sink. 5202 is base only. 5203, 5204 and 5205 have base and top.*	5202 5203 5204 5205	.375 .515 .515 .515	@ 4 W = 13.2°C/W @ 5 W = 11.4°C/W @ 5 W = 11.4°C/W @ 5 W = 11.4°C/W
A17	Two-piece heat sink.**	5166	.609	@ 3 W = 16.6°C/W
A18	Vertical mount. High density. Custom hole patterns.	5029	5.00	@ 20 W = 2.50°C/W
A19	High power dissipation per unit cost.	5690 5790	1.31 1.00	@ 10 W = 5.40°C/W @ 8 W = 6.25°C/W
A20	Low profile. Ideal for PC board applications.	5671 5672	1.40 2.00	@ 3 W = 16.6°C/W @ 5 W = 10.1°C/W
A21	Economy low profile for high density PC boards.	5060 5061	.375 .375	@ 6 W = 8.00°C/W @ 8 W = 6.25°C/W
A22	"Ditto" strips in 1 to 39 unit lengths. Single unit, 1.495″ L. Add 1.5″ each extra unit.*	5701 single	.935	@ 7 W = 7.10°C/W
A23	Nearly 1/8″ thick for heavy cooling in small space.*	5030 5031	2.81 3.00	@ 17 W = 2.94°C/W @ 20 W = 2.75°C/W

* Does not accept TO-66. ** Does not accept TO-3.
*** Specify height when ordering.

† Finishes: black, blue, bronze, red anodize, and gold chromate. Suffix required to specify finish. Example: 5501B for black.

AAVID™
AAVID ENGINEERING, INC.
One Kool Path, Box 400, Laconia, NH 03247
Tel. (603) 528-3400 TWX 510-298-1127
FAX (603) 528-1478

HEAT SINKS for TO-220

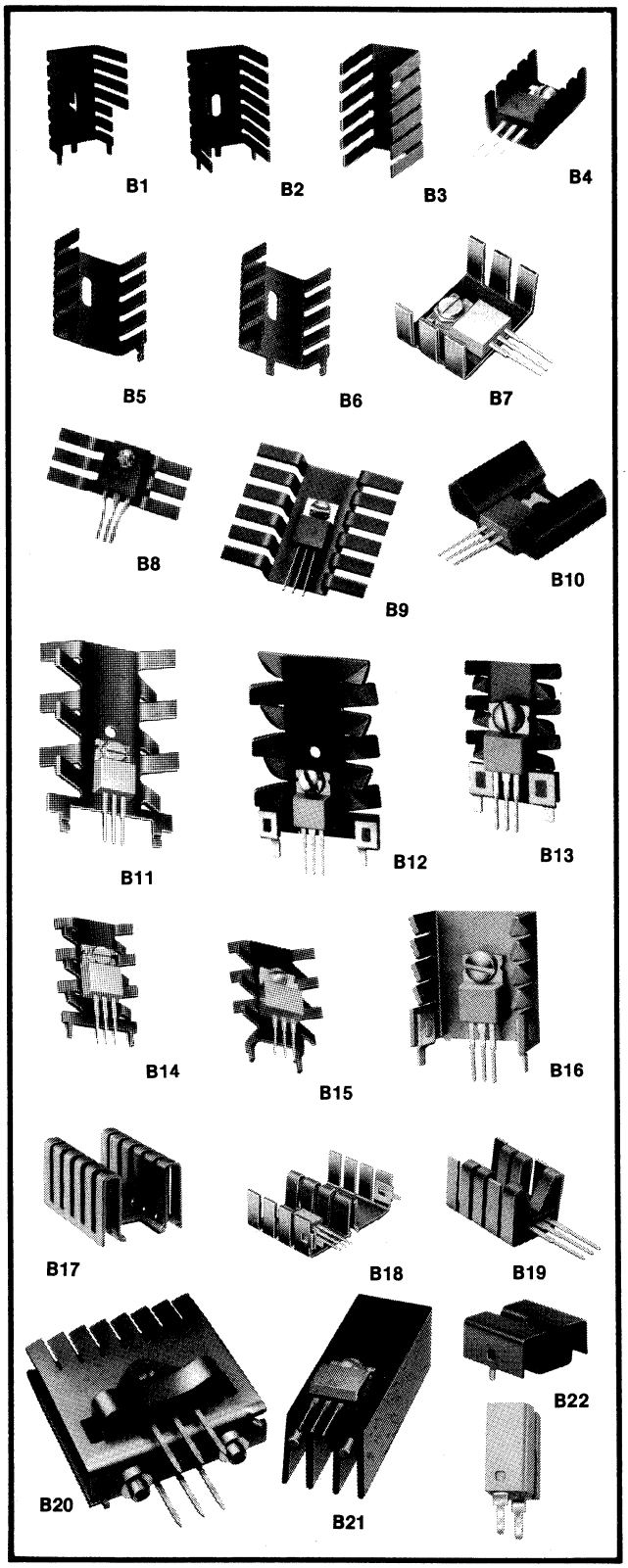

Fig. No.	Description	Model No.†	Height Inches	Thermal Resist. @ Typical Load
B1	Low Cost. With bottom fins recessed for close component mounting. Tinned or twist tabs.	5501 5502 5901	1.675 1.675 1.675	@ 4 W = 11.5°C/W @ 4 W = 11.5°C/W @ 4 W = 11.5°C/W
B2	Economical, high performance. Tinned or twist tabs. Vertically mounted.	5503 5504 5903	1.675 1.675 1.675	@ 5 W = 9.20°C/W @ 5 W = 9.20°C/W @ 5 W = 9.20°C/W
B3	Low-cost, narrow profile. Minimum footprint.*	5041 5042	.700 1.45	@ 3 W = 18.6°C/W @ 6 W = 8.83°C/W
B4	Slim, low-cost. With or without tinned tabs for soldering. Horizontal mount.	5770 5771 5772	.250 .375 .500	@ 1.5 W = 34.6°C/W @ 2 W = 27.5°C/W @ 2 W = 25.0°C/W
B5	Low-cost, vertical mount. Tinned or twist tabs.	5750	1.18	@ 4 W = 14.5°C/W
B6	Low-cost, vertical mount. Tinned or twist tabs.	5630 5766	1.18 .950	@ 4 W = 14.5°C/W @ 3 W = 18.3°C/W
B7	Lightweight. Horizontal mount. 5306 accommodates 2 devices. 3 lengths.*	5306 5307 5760	.500 .500 .375	@ 3 W 2 18.3°C/W @ 2 W = 24.0°C/W @ 2 W = 24.0°C/W
B8	Economy, low profile. For PCBs with 0.50″ separation. Horizontal mount. 2 widths (1.25″ and 1.75″).	5069 5070	.375 .375	@ 2 W = 22.5°C/W @ 3 W = 18.6°C/W
B9	Economy, low profile. For PCBs with 0.50″ separation. Horizontal mount.*	5072	.375	@ 5 W = 9.60°C/W
B10	Low-cost, snap-down. Vertical or horizontal mount. If used horizontally, height is .435″.	5751	.750	@ 3 W = 16.6°C/W
B11	Low-cost, vertical mount. Tinned or twist tabs.	5632	2.00	@ 5 W = 11.0°C/W
B12	Low-cost, twisted fins improve cooling. Vertical mount. Wave solderable.	5932	2.00	@ 5 W = 10.4°C/W
B13	Low-cost, twisted fins improve cooling. Wave solderable. Vertical mount.	5925	1.25	@ 2 W = 24.0°C/W
B14	Low-cost, space saver. Vertical mount. Tinned or twist tabs.	5425	1.25	@ 2 W = 25.0°C/W
B15	Extra stable, vertical mount. Tinned or twist tabs. Minimum footprint.	5755	1.25	@ 2 W = 25.0°C/W
B16	Wave solderable tin tabs. Vertical mount.	5930	1.18	@ 4 W = 14.0°C/W
B17	Low-cost, high performance. Horizontal mount.	5510	.787	@ 5 W = 11.0°C/W
B18	High performance for 2 devices. Vertical or horizontal. Tinned or twist tabs.	5779 5786	1.03 1.03	@ 5 W = 10.4°C/W @ 5 W = 10.4°C/W
B19	Slimmest plug-in, 1/2″ wide. Vertical or horizontal. With or without tinned tabs.	5768 5968 5910	.750 .750 .500	@ 3 W = 18.0°C/W @ 3 W = 18.0°C/W @ 3 W = 18.0°C/W
B20	Holds 1 device on each side. Spring clip for fast device mounting. Staggered or twisted fins. Small footprint. Wave solderable.*	E5301 E5304	1.75 1.75	@ 8 W 2 6.88°C/W @ 8 W = 6.75°C/W
B21	Heavy duty, vertical mount. Solder pin, or screw mount to eliminate stress on leads. Small footprint.	5810 5811 5812	1.00 1.50 2.00	@ 2.5 W = 19.2°C/W @ 3 W = 16.0°C/W @ 4 W 2 12.0°C/W
B22	Plug-in for fast mounting without hardware. Horizontal or vertical. Available with short, long and stepped tin tabs. or no tabs.	5744 5789 5933 5936 5939	.395 .395 .750 .690 1.375	@ 3 W = 20.0°C/W @ 3 W = 21.0°C/W @ 3 W = 20.0°C/W @ 3 W = 21.0°C/W @ 4 W = 14.5°C/W

* Also accepts TO-218.

† Finishes: black, blue, bronze, red anodize, and gold chromate. Suffix required to specify finish. Example: 5501B for black.

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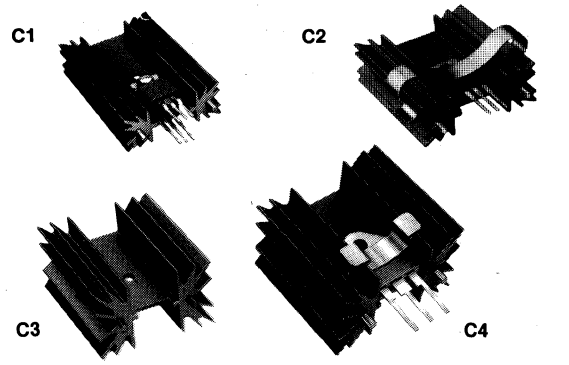
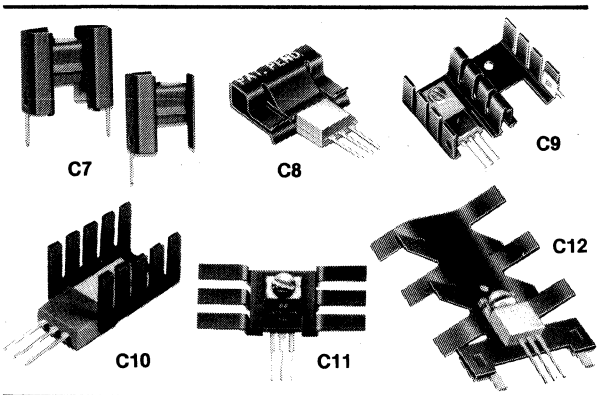
HEAT SINKS for TO-220 and TO-218



for TO-126 and TO-127

for TO-202



Factory Applied Options

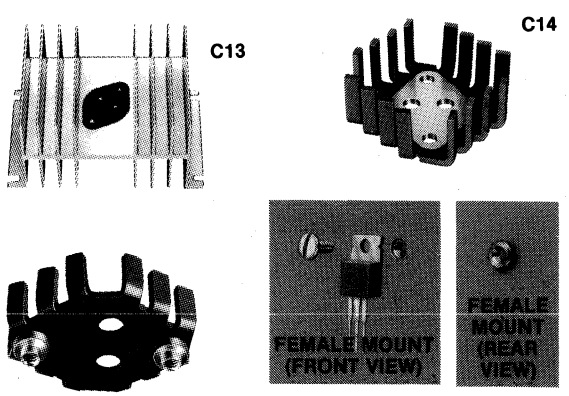


Fig. No.	Description	Model No.†	Height Inches	Thermal Resist. @ Typical Load
C1	Vertical mount with solder pins, shoulder pins or less pins for screw mounting. Also accepts TO-126 and TO-127.	513001 513101 513201 513301	1.00 1.50 2.00 2.50	@ 4 W = 13.5°C/W @ 5 W = 11.0°C/W @ 6 W = 9.00°C/W @ 7 W = 7.57°C/W
C2	Fast device mounting with spring clip. Vertical mount with solder pins, shoulder pins or less pins for screw mounting. Small footprint.	5330 5331 5332 5333	1.00 1.50 2.00 2.50	@ 4 W = 13.5°C/W @ 5 W = 11.0°C/W @ 6 W = 9.00°C/W @ 7 W = 7.57°C/W
C3	Heavy duty. Vertical mount with solder pins, shoulder pins or less pins for screw mounting. Small footprint.	5297 5298 5299 5300	1.00 1.50 2.00 2.50	@ 8 W = 6.30° C/W @ 10 W = 5.00°C/W @ 12 W = 4.16°C/W @ 16 W = 3.12°C/W
C4	Heavy duty. Fast device mounting with low-profile spring clip. Vertical mount with solder pins, shoulder pins or less pins for screw mounting. Small footprint.	5337 5334 5335 5336	1.00 1.50 2.00 2.50	@ 8 W = 6.30° C/W @ 10 W = 5.00°C/W @ 12 W = 4.16°C/W @ 16 W = 3.12°C/W
C5	Low-cost slip-in. 5775 for TO-126, 5776 for TO-127.	5775 5776	.520 .750	@ 2 W = 27.0°C/W @ 2 W = 27.0°C/W
C6	Economy, low-profile. Horizontal mount. For PCBs with 0.50″ separation. Also accepts TO-220.	5073	.375	@ 2 W = 29.0°C/W
C7	Economy clip-on for fast mounting without hardware. Fins on one or both sides. With or without tin tabs.	5767 5942 5996 5997	.900 .900 .900 .900	@ 3 W = 16.6°C/W @ 3 W = 16.6°C/W @ 2 W = 25.0°C/W @ 2 W = 25.0°C/W
C8	Economy slip-on, locking tab. Requires no hardware to mount.	5740	.570	@ 2 W = 29.0°C/W
C9	High performance for 2 devices. Vertical or horizontal. Tinned or twist tabs.	5780 5787	1.03 1.03	@ 5 W = 10.6°C/W @ 5 W = 10.6°C/W
C10	Trim, low-profile. Horizontal or vertical. Minimal PCB space.	5769 5773 5774	.250 .375 .500	@ 1.5 W = 34.6°C/W @ 2 W = 27.5°C/W @ 2 W = 25.0°C/W
C11	Economy, low-profile. For PCBs with 0.50″ separation. Horizontal mount.	5063	.375	@ 3 W = 18.6°C/W
C12	Low-cost. Vertical mount. Tinned or twist tabs.	5634	2.00	@ 5 W = 11.0°C/W

C13 **RUBBER-DUC™**

Grease-free interface between heat sinks and semiconductors. Improves thermal conductivity and provides 4000 V electrical isolation.

C14 **KON-DUX™**

Grease-free interface between heat sinks and semiconductors. Excellent thermal and electrical conductivity.

C15 **WAVE-ON™ MOUNTS**

For wave soldering to PC boards. With threaded mounts for mounting device to heat sink. Built-in standoffs.

C16 **CAPTIVE HARDWARE**

For fastening semiconductors to heat sinks with machine screws or nuts. Built-in female and male mounts available.

† Finishes: black, blue, bronze, red anodize, and gold chromate. Suffix required to specify finish. Example: 5501B for black.

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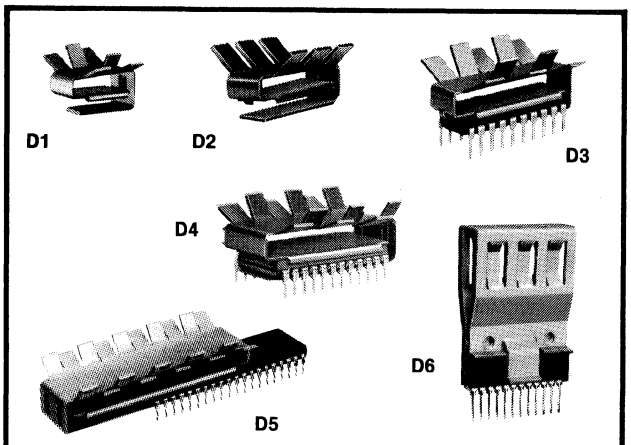
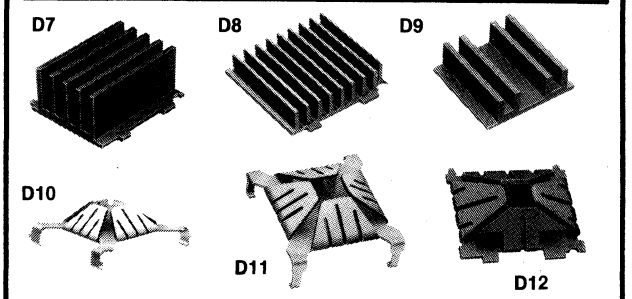
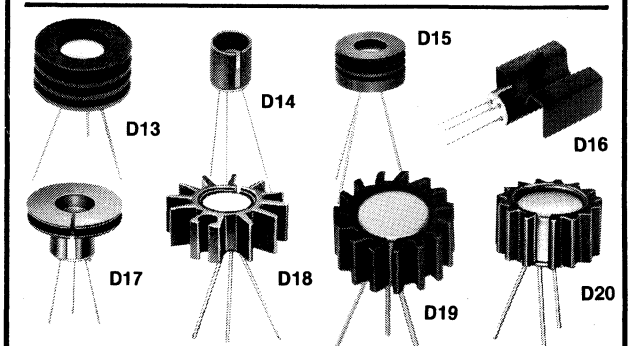
HEAT SINKS for DIP's and SIP's



For 68-Lead Socket



For TO-5



For TO-92

Fig. No.	Description	Model No.†	Height Inches	Thermal Resist. @ Typical Load
D1	Slides quickly on 8-pin DIP. No gluing. Top and bottom conduction paths.	5801	.450	@ 0.5 W = 42.0°C/W
D2	Slides quickly on 14 or 16-pin DIP. No gluing. Top and bottom conduction paths.	5802 5602	.410 .410	@ 0.8 W = 38.0°C/W @ 0.8 W = 38.0°C/W
D3	Slides quickly on 18 or 20-pin DIP. No gluing. Top and bottom conduction paths.	5803 5804	.556 .556	@ 1.0 W = 36.0°C/W @ 1.5 W = 35.0°C/W
D4	Slides quickly on 24 or 28-pin DIP. No gluing. Top and bottom conduction paths.	5805 5806	.580 .580	@ 1.8 W = 30.0°C/W @ 2 W = 28.0°C/W
D5	Slides quickly on 40-pin DIP. No gluing. Top and bottom conduction paths.	5807	.590	@ 2.5 W = 20.0°C/W
D6	Low-cost clip-on for 12-pin SIP. Large cooling surface. With, without tinned tabs.	5840	1.70	@ 5 W = 11.0°C/W
D7 D8	Perfect match for Textool chip carrier sockets. Heat sink acts as lid, speeds assembly.	5826 5827 5830 5831 5832 5833	.300 .530 .260 .560 .280 .280	@ 5 W = 9.60°C/W @ 6 W = 8.00°C/W @ 5 W = 9.60°C/W @ 7 W = 7.40°C/W @ 5 W = 10.4°C/W @ 4 W = 11.5°C/W
D9	Perfect match for Robinson-Nugent sockets. Acts as lid, speeds assembly.	5828	.312	@ 4 W = 17°C/W
D10	Bidirectional cooling, for AMP sockets. Acts as lid, speeds assembly.	5101	.500	@ 5 W = 15°C/W
D11	Bidirectional cooling, for Robinson-Nugent sockets. Acts as lid, speeds assembly.	5102	.592	@ 4 W = 5°C/W
D12	Bidirectional cooling, for Textool sockets. Acts as lid, speeds assembly	5103	.300	@ 4 W = 5°C/W
D13	2-piece for maximum thermal transfer.	321127	.350	@ 1 W = 50°C/W
D14	Economy press-on cooler. No extra board space needed.	311405 311505	1.25 .400	@ 1 W = 50°C/W @ 0.6 W = 63°C/W
D15	2-piece convection cooler.	3215	.330	@ 1 W = 40°C/W
D16	Snap-on cooler, easy to install. May be installed after wave soldering. Minimal PCB space required.	5781 5782 5783 5784 5785	.406 .500 .750 1.00 1.25	@ 1.2 W = 32°C/W @ 1.4 W = 34°C/W @ 1.6 W = 30.0°C/W @ 1.8 W = 26.6°C/W @ 2.0 W = 26.0°C/W
D17	Low-cost, easily installed before or after assembly. Minimal PCB space required.	3225 3226	.400 .250	@ 1 W = 50.0°C/W @ .75 W = 64.0°C/W
D18	Extra surface for better cooling.	3230	.250	@ 1 W = 56.0°C/W
D19	Extra surface for better cooling. For component card applications.	3201	.250	@ 0.8 W = 65.0°C/W
D20	Low-cost, press-on cooler. Excellent heat conduction.	3257 3260	.250 .375	@ 0.8 W = 65.0°C/W @ 1 W = 57.0°C/W
D21	Low-cost, slip-on. Easy to install. No PCB space required.	5752 5753 5754	.720 .970 1.22	@ 1 W = 52.0°C/W @ 1 W = 43.0°C/W @ 1 W = 38.0°C/W
D22	Low-cost, press-on. Also for TO-18.	3224	.235	@ 0.5 W = 100°C/W

† Finishes: black, blue, bronze, red anodize, and gold chromate. Suffix to specify finish. Example: 5501B for black.

Accessories

- Ther-O-Bond 2000 no-mix 2-part thermally-conductive adhesive system.
- Ther-O-Bond 1500 & 1600 thermally-conductive epoxy adhesives.
- Ther-O-Link 1000 silicone-free thermally-conductive compound.
- Capacitor clamps and brackets.
- Mounting insulators, washers and standoffs.

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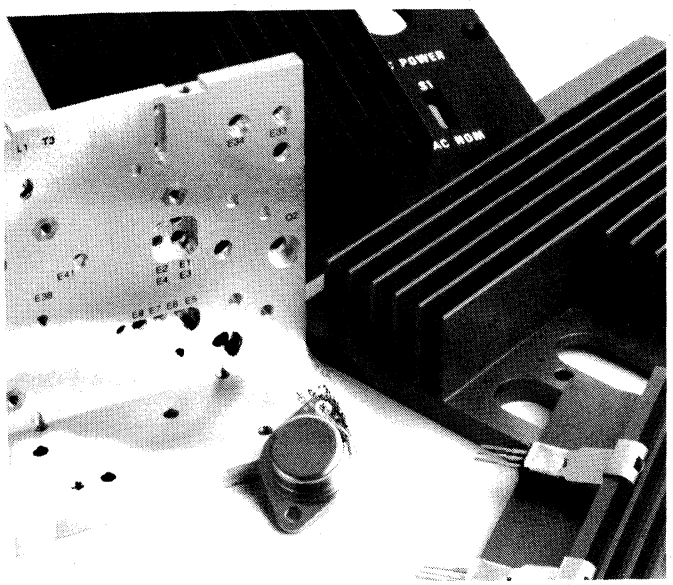
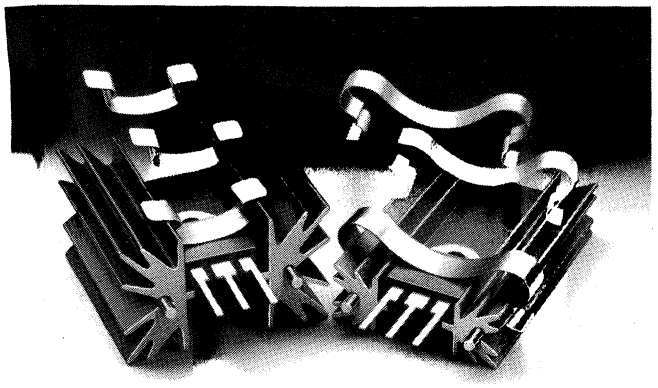
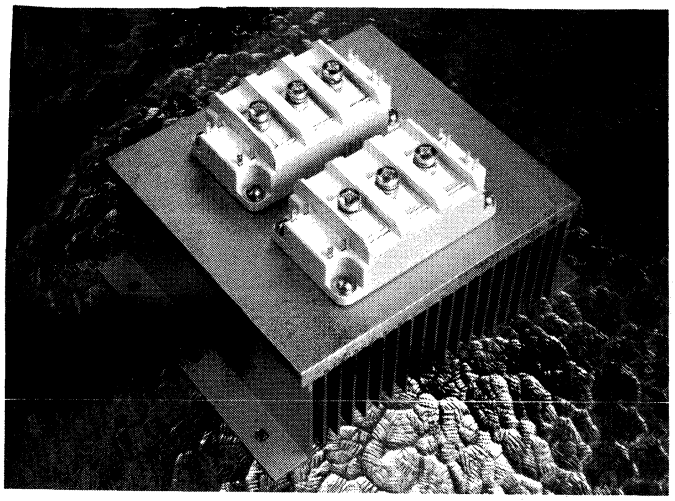
HEAT SINKS EXTRUSIONS AND OTHER PRODUCTS







COST-EFFECTIVE SOLUTIONS FOR COMPLEX THERMAL REQUIREMENTS

Some of the most unusual and complex extruded heat sinks are being designed and manufactured regularly by Aavid. We have a reputation for devising cost-effective solutions for your thermal problems.

THE MOST COMPLETE SELECTION

Aavid offers the industry's best selection of extruded heat sinks. They are designed to cool all kinds of semiconductors — from power transistors to high-current SCRs, rectifiers, solid state relays and power modules. Our extensive range of over 2000 cross-sectional designs will meet nearly any application requirements.

FABRICATED TO MEET YOUR SPECS

We'll help you select a standard extrusion, fabricated to satisfy your performance, cost and production requirements. Or we'll assist in designing custom extruded shapes to meet your special engineering needs.

DOZENS OF SECONDARY OPERATIONS

Aavid is equipped for virtually any secondary operation from routine cut, deburr and wash to complex milling and stamping. Typical secondary operations are:

- Broaching
- Chamfering
- Counterboring
- Cutting
- Deburring
- Drilling
- Fly cutting
- Milling
- Punching
- Reaming
- Sanding
- Slotting
- Stamping
- Tapping
- Tumbling
- Washing

FINISHING OPTIONS

Aavid offers a complete range of finishing operations and other options, including:

- Anodizing—regular & hard
- Caustic etching
- Chromating
- Irriditing
- Painting
- Silk screening
- Tin plating

OTHER OPTIONS

- Bushings
- Insulators
- Threaded inserts
- Wave-on Mounts™

SPRING CLIPS FOR FAST MOUNTING

Mounting TO-218s, TO-220s, and other tab-mount semiconductors has never been faster — or easier. Aavid spring clips (center photo) snap into place and apply pressure evenly, eliminating gaps between heat sink and semiconductor. Available with various extruded and stamped heat sinks, capable of cooling 1 to 4 plastic packages.

DOUBLE YOUR THERMAL PERFORMANCE WITH EPOXY-BONDED HEAT SINKS

Aavid's bonded-fin heat sinks double the cooling surface of extruded heat sinks (bottom photo). With epoxy-bonding, we get twice as many fins in the same volume, cutting thermal resistance to as low as 0.024° C/W for forced air, and 0.22° C/W for natural convection. 9 sizes for all standard power modules. Unlimited custom possibilities.

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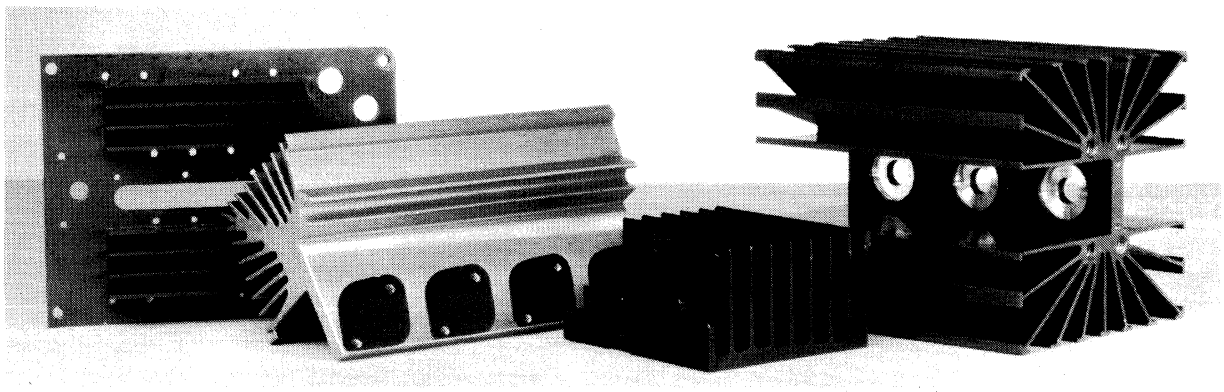
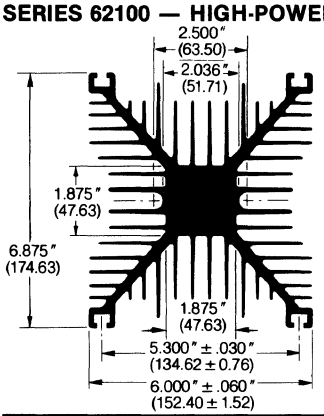
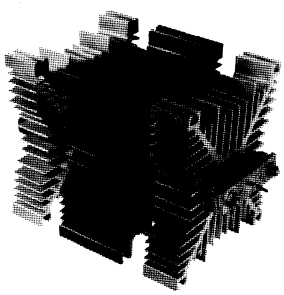
HEAT SINKS EXTRUSIONS

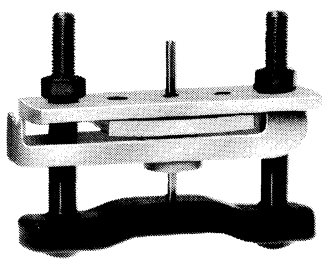


SERIES 62100 — HIGH-POWER HEAT SINK



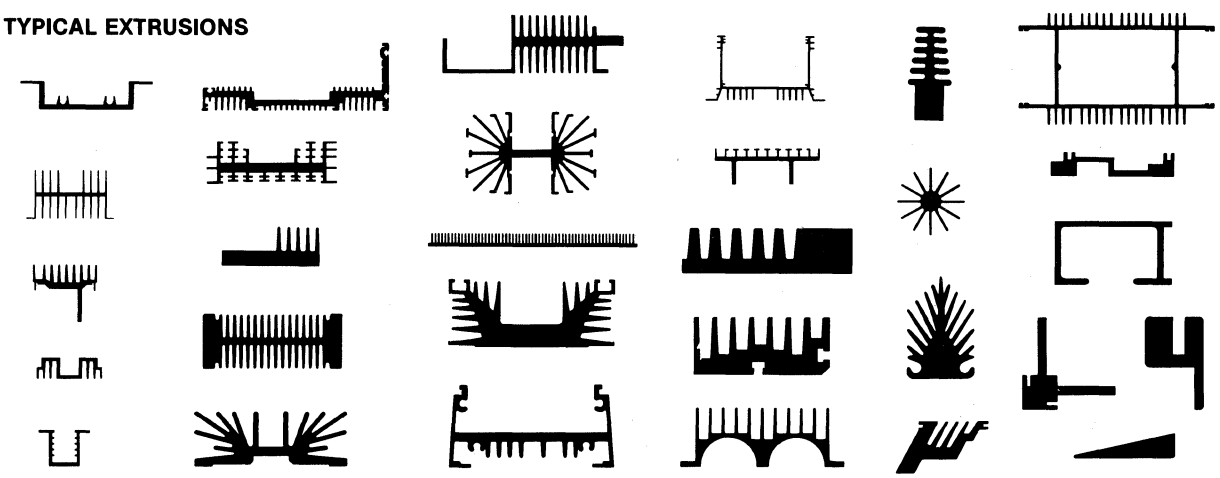


SERIES 4130 — HOCKEY PUCK CLAMP



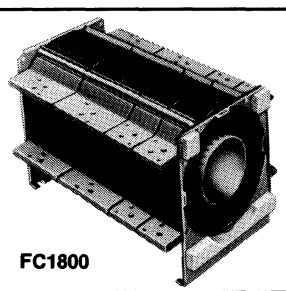
The clamps are rated at 2,000 lbs. maximum working load and are ideally matched to our series 62100 and other high power heat sinks. Clamp capacity ranges from .66″ to 12.63″.

TYPICAL EXTRUSIONS



FORCED CONVECTION COOLERS

Forced convection cooling packages offer optimum thermal performance and low airflow resistance. With a unique fin design and fin spacing, they offer maximum heat transfer per ounce at minimum cost. The coolers offer easy component accessibility in a lightweight, compact construction.



FC1800

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You should thoroughly test any proposed use of our products and independently conclude satisfactory performance in your application.

Suggestions of uses should not be taken as inducements to infringe any patents.

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AMCO ®

"NEARLY FIVE DECADES"

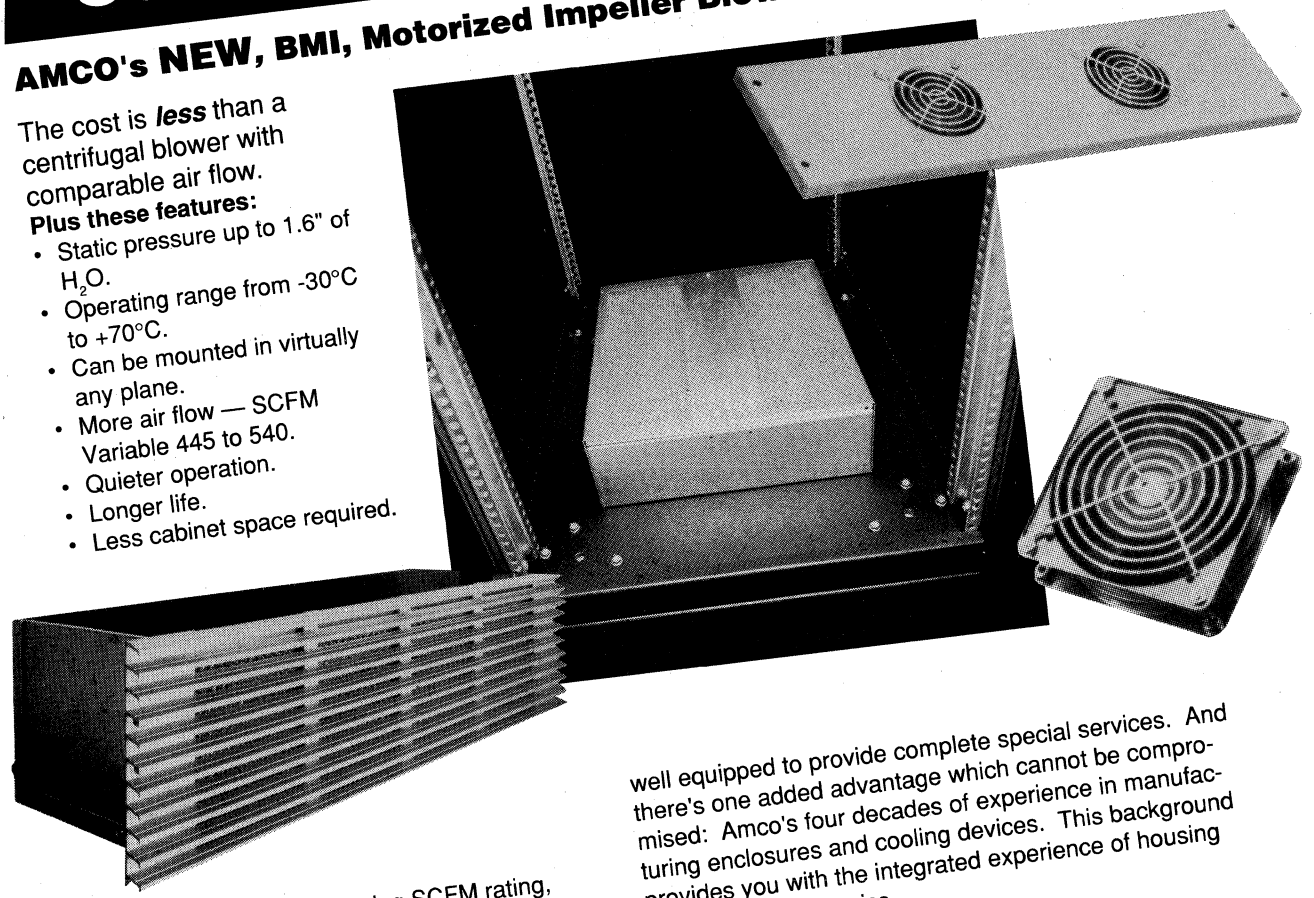
Cooling Devices for Electronics

AMCO's NEW, BMI, Motorized Impeller Blower!

The cost is ***less*** than a centrifugal blower with comparable air flow.

Plus these features:

- Static pressure up to 1.6" of H_2O.
- Operating range from -30°C to +70°C.
- Can be mounted in virtually any plane.
- More air flow — SCFM Variable 445 to 540.
- Quieter operation.
- Longer life.
- Less cabinet space required.



You benefit directly from our on-going SCFM rating, noise level monitoring, vibration studies and endurance evaluation conducted in our own laboratories. We are well equipped to provide complete special services. And there's one added advantage which cannot be compromised: Amco's four decades of experience in manufacturing enclosures and cooling devices. This background provides you with the integrated experience of housing and cooling electronics.

Blowers

Cooling Device	Variable Air Flow	Air Flow Min.	SCFM Max.*	Max. Pressure Inches H2O	Type of Mounting
BMI	Yes	445	540	1.6	Base or Panel
BDS5HF	Yes	220	300	.75	Panel
BDSRF8	No	-	360	.60	Panel
BRDS	Yes	325	400	.60	Recessed
BDS8	Yes	325	425	.60	Panel Recessed
BRDSPM					
BDS10	Yes	600	700	.90	Panel

*Rated with grille, filter and outlet guards in place.

Tube Axial Fans

Cooling Device	Variable Air Flow	Air Flow Min.	SCFM Max.	Max. Pressure Inches H2O	Type of Mounting
BTA3	No	-	27	.20	Panel
BTA4LF	No	-	60	.09	Panel
BTA4HF	No	-	100	.30	Panel
BTA6	No	-	260	.80	Panel
BTA10	Yes	475	540	.45	Top Panel

If you have requirements not covered in these performance values, call us, we'll do our best to satisfy your needs.

CALL TOLL FREE 1-800-833-3156 In Illinois Call (312) 671-6670 * for AMCO's full line cooling devices catalog #850

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3801 North Rose St. Schiller Park, IL 60176-2190
TWX: 910-227-3152 FAX: 312:671-9496*
*As of November 11, 1989—New Area Code will be 708

CAMBRIDGE AEROFLO, INC.

Sensors and Switches for Air and Mass Flow

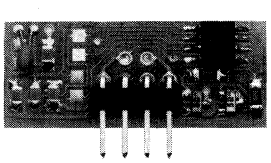
These compact, solid-state devices feature a self-heated glass bead thermistor which compensates for ambient temperature, air speed, altitude, relative humidity, and reversal in air flow. Including normally-open or normally-closed versions, they can be calibrated to standard curves or to your own specifications and can be mounted virtually anywhere to monitor the actual cooling air streams of computers, telecommunications equipment, instrument packages and other heat sensitive devices. Contact us for specifications on the following standard product lines:

Product	Description
Series 305	5 V Air Flow/Mass Flow Switch
Series 300T	12-24 V Air Flow/Mass Flow Switch

Precision Temperature Sensors and Switches

A line of air temperature sensors and switches, accurate to ±1°C, is available in remotely mountable packages as well as in compact board-mountable SIP form. Contact us for specifications on the following standard product lines:

Product	Description	Package
Series TP	Compact Board-Mountable Switch with Dual Output Option (±1°C)	SIP .480″ x 1.20″
Series TS	12-24 V (±1°C) Switch	½″ dia. x 3″L
Series TS5	5 V (±1°C) Switch	½″ dia. x 3″L
Series T240	12-24 V Analog O/P (±1°C)	½″ dia. x 3″L
Series T245	5 V Analog O/P (±1°C)	½″ dia. x 3″L

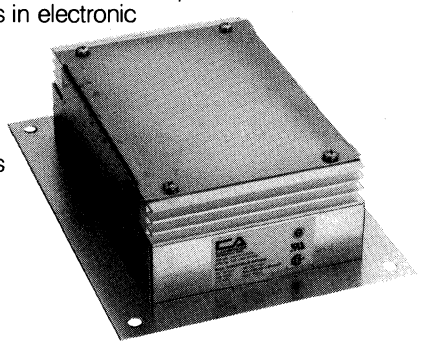


Standard Products

- Air flow sensors
- Air flow switches
- Mass flow sensors
- Mass flow switches
- Temperature sensors
- Temperature switches
- AC Blower speed controls
- Brushless DC motor drivers
- High voltage DC motor drivers
- Variable voltage DC fan and blower controls

High Voltage DC Motor Drivers

Series HVMD motor drivers utilize the 300 VDC bus to directly drive standard "off-the-shelf" 3-phase AC motors for blower applications in electronic package cooling. Capable of driving motors up to 1 HP, this same series is also available to drive high voltage brushless DC motors. They are UL, CSA, and TUV approved.



Cooling Management Systems

Custom engineered to your space and electrical requirements, our cooling management systems feature variable speed or two-speed controls for fans or blowers and include built-in power conversion, failure indicators, temperature controls and fault reporting. Supplied as a single board controller or complete with air and temperature sensing devices, they can incorporate fail-safe designs if necessary.

Applications Engineering

Cambridge Aeroflo provides custom engineered solutions to your cooling management problems by utilizing these field proven products and adapting them to your specific requirements. Our major customers include the world's largest computer and telecommunications companies.

Contact us with your requirements:

CAMBRIDGE AEROFLO, INC.

Customer oriented, customer driven.

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900 Mt. Laurel Circle, Shirley, Massachusetts USA 01464
Phone: (508) 425-2346 Fax: (508) 425-2338

DC FAN WITH MINIMUM NOISE

GENERAL SPECIFICATION

Dielectric Strength	5mA max. at 500V AC 1min. between lead wire & outer sect.
Insulation Resistance	10M OHM between lead wire & outer section (DC 500V)
Life Expectation	30,000 hrs min. at temp. 25°C. humidity 65% ± 20%
Operating Temperature	−10°C ~ +70°C (+14°F ~ +158°F)
Storage Temperature	−40°C ~ +75°C (−40°F ~ +167°F)

Weight	125g(4.41 OZ)
Protection	Locked rotor protection, polarity protection
Insulation Class	UL: Class A
Bearing	Ball bearing
Lead Wire	UL 1007 AWG24
Casing. Impeller	Black PBT (UL 94V-0)

* Noise is measured at rated voltage in semi-anechoic chamber in free air as below:

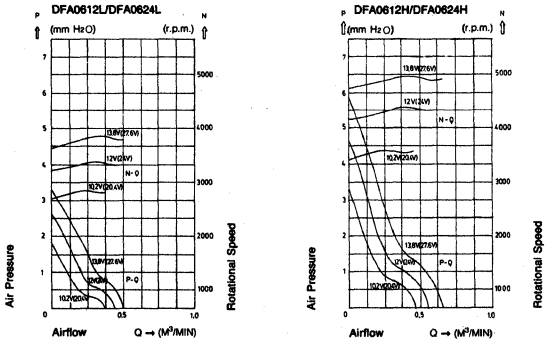
TECHNICAL DATA FOR EACH SERIES

60MM

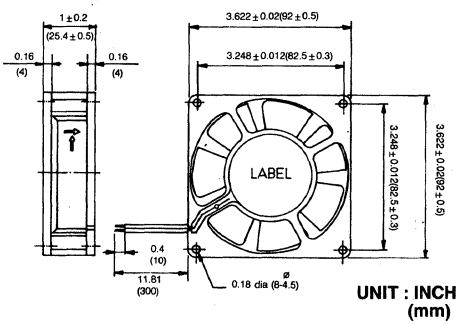
TYPE	DFA0612L	DFA0612H	DFA0624L	DFA0624H
Rated Voltage	12VDC		24VDC	
Operating Voltage	10.2–13.8VDC		20.4–27.6VDC	
Rated Current (A)	0.08	0.13	0.06	0.08
Rated Input Power (W)	0.96	1.56	1.44	1.92
Max. Air Flow M³/min. (CFM)	0.41 (14.48)	0.55 (19.42)	0.41 (14.48)	0.55 (19.42)
Max. Air Pressure mmAq (inAq)	2.60 (0.102)	4.70 (0.185)	2.60 (0.102)	4.70 (0.185)
Rotational Speed (r.p.m.)	3300	4400	3300	4400
Acoustical Noise dB(A)	27	36	27	36
Weight	80g (2.82 OZ)			

* All readings are typical Values

AIRFLOW CURVES



DIMENSIONS



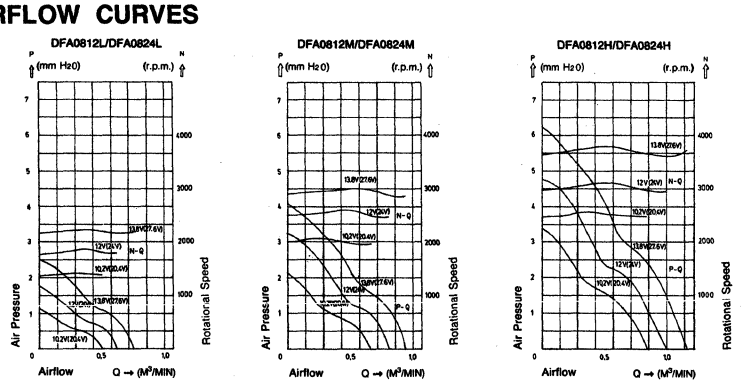
This specification is subject to change without notice

80MM

TYPE	DFA0812L	DFA0812M	DFA0812H	DFA0824L	DFA0824M	DFA0824H
Rated Voltage	12VDC			24VDC		
Operating Voltage	10.2–13.8VDC			20.4–27.6VDC		
Rated Current (A)	0.06	0.10	0.17	0.05	0.08	0.10
Rated Input Power (W)	0.72	1.20	2.04	1.20	1.92	2.40
Max. Air Flow M³/min. (CFM)	0.63 (22.2)	0.85 (30)	1.0 (35.3)	0.63 (22.2)	0.85 (30)	1.0 (35.3)
Max. Air Pressure mmAq(inAq)	1.8 (0.07)	3.2 (0.12)	4.9 (0.19)	1.8 (0.07)	3.2 (0.12)	4.9 (0.19)
Rotational Speed	1800	2500	3000	1800	2500	3000
Acoustical Noise dB(A)	24	30	35	24	30	35
Weight	125g (4.41 OZ)					

* All readings are typical Values

AIRFLOW CURVES



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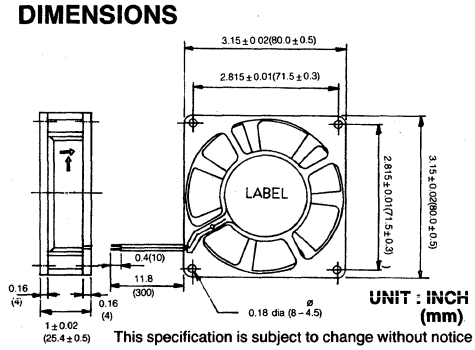

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TELEFAX: (415) 770-0122

DELTA PRODUCTS CORP.
43 GANNET ROAD
FARMINGTON, NY 14425
TELEPHONE: (716) 924-7590
TELEFAX: (716) 924-9851

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TELEFAX: (2) 7169764

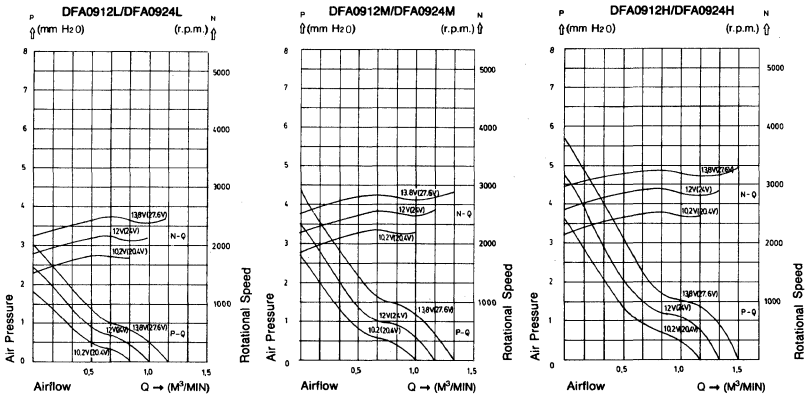
DELTA

92MM

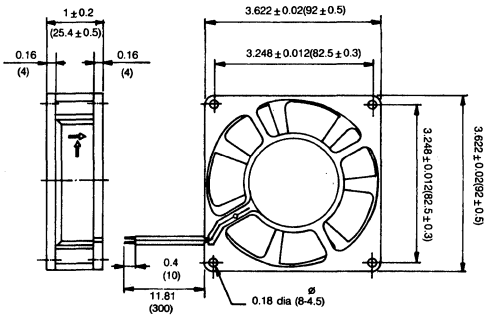
TYPE	DFA0912L	DFA0912M	DFA0912H	DFA0924L	DFA0924M	DFA0924H
Rated Voltage	12VDC			24VDC		
Operating Voltage	10.2–13.8VDC			20.4–27.6VDC		
Rated Current (A)	0.10	0.13	0.20	0.06	0.10	0.12
Rated Input Power (W)	1.2	1.56	2.40	1.44	2.40	2.88
Max. Air Flow M³/min. (CFM)	1.0 (35.32)	1.2 (42.40)	1.4 (49.50)	1.0 (35.32)	1.2 (42.40)	1.4 (49.50)
Max. Air Pressure mmAq(inAq)	2.6 (0.10)	3.6 (0.14)	4.8 (0.19)	2.6 (0.10)	3.6 (0.14)	4.8 (0.19)
Rotational Speed (r.p.m.)	2000	2500	3000	2000	2500	3000
Acoustical Noise dB(A)	27	32	36	27	32	36
Weight	140g (4.94 OZ)					

* All readings are typical Values

AIRFLOW CURVES



DIMENSIONS



UNIT : INCH
(mm)

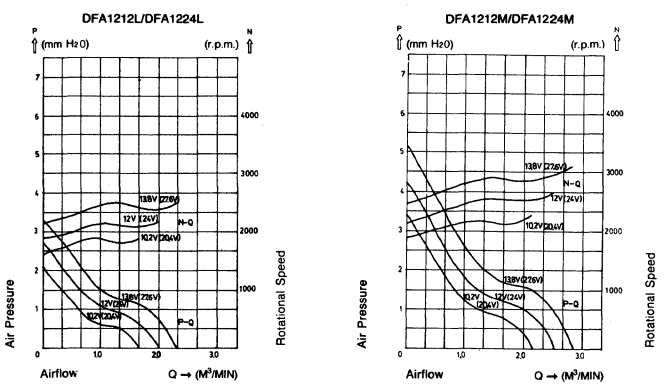
This specification is subject to change without notice

120MM

ITEM \ TYPE	DFA1212L	DFA1212M	DFA1224L	DFA1223M
Rated Voltage	12VDC		24VDC	
Operating Voltage	10.2–13.8VDC		20.4–27.6VDC	
Rated Current (A)	0.18	0.38	0.10	0.25
Rated Input Power (W)	2.16	4.56	2.4	6.0
Max. Air Flow M³/min. (CFM)	2.0 (70.6)	2.5 (88.3)	2.0 (70.6)	2.5 (88.3)
Max. Air Pressure mmAq (inAq)	2.70 (0.11)	4.2 (0.165)	2.70 (0.11)	4.2 (0.165)
Rotational Speed (r.p.m.)	2000	2500	2000	2500
Acoustical Noise dB(A)	37	42	37	42
Weight	180g (6.35 OZ)			

* All readings are typical Values

AIRFLOW CURVES



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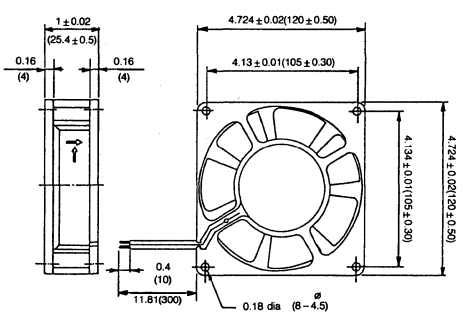

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ebm Brushless DC Tubeaxial Fans

Performances to 235 CFM
Sizes 3-1/8" to 6-3/4"

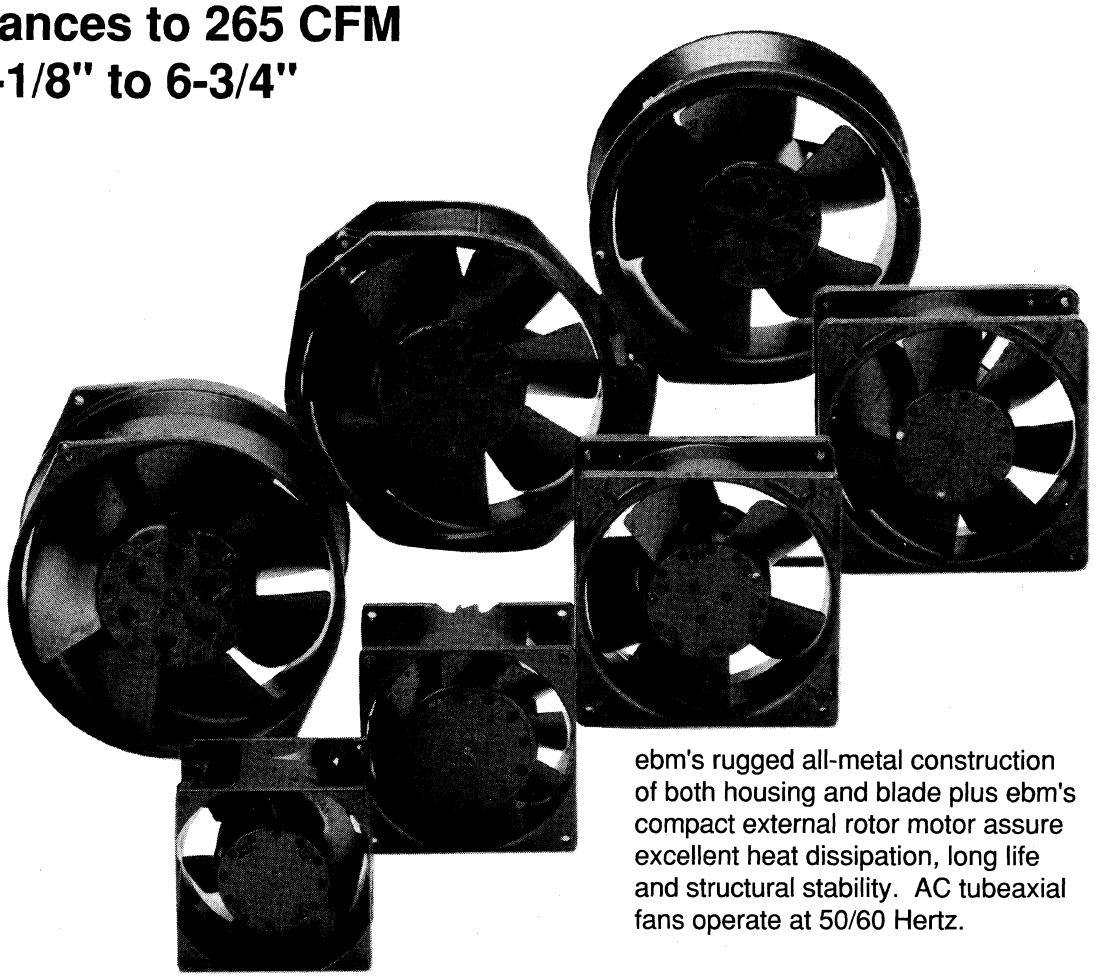
ebm's brushless DC tubeaxial fans feature an external rotor motor with electronic controls built in to the motor. Blades and housings are either plastic or metal as indicated. A maintenance-free bearing system and dual plane dynamic balancing insure operating reliability.

Series	Dimensions (In.)	CFM Range	DC Volts	Features	Construction
W2G075	3.125 square x 1.5	34	12, 24, 48v	11.5" leads, Hall effect	Metal
W2G076	3.125 square x 1.25	18, 22, 32 or 38	12, 24, 48v	10.5" leads, Terminals, Hall effect	Plastic
W2G086	3.625 square x 1.5	42	12, 24, 48v	11" leads, Hall effect	Metal
W2G086	3.625 square x 1.25	47 or 52	12, 24, 48v	10.5" leads, Terminals, Hall effect	Plastic
W2G107	4.688 square x 1.5	70 or 100	12, 24, 48v	10.5" leads, Terminals, Hall effect	Metal
W2G110	4.688 square x 1.5	100 or 110	12, 24, 48v	10.5"leads, Terminals, Hall effect	Metal
W2G113	4.688 square x 1.25	56, 82 or 100	12, 24, 48v	10.5" leads, Terminals, Hall effect	Plastic
W2G115	5.0 square x 1.5	110, 125 or 130	12, 24, 48v	10.5" leads, Terminals, Hall effect	Metal
W2G130	6.0 round x 2	218	12, 24, 48v	13" leads, Terminals, Hall effect	Metal
W2G143	6.75 round x 2	235	12, 24, 48v	10" leads or Terminals, Hall effect	Metal

ebm Industries, Inc.
110 Hyde Road
Farmington, CT 06032
phone 203-674-1515
fax 203-674-8536

ebm AC Tubeaxial Fans

Performances to 265 CFM
Sizes 3-1/8" to 6-3/4"



ebm's rugged all-metal construction of both housing and blade plus ebm's compact external rotor motor assure excellent heat dissipation, long life and structural stability. AC tubeaxial fans operate at 50/60 Hertz.

Series	Dimensions (in.)	CFM Range	AC Volts	Features
W2S076	3.125 square x 1.5	16 to 36	115, 230, 115/230	11.5" leads, Terminals, Struts on inlet or discharge
W2S086	3.625 square x 1.5	25, 35 or 46	115, 230	11" leads, Hall effect
W2S107	4.688 square x 1.5	45, 51, 71 or 106	115, 230, 115/230	10.5" leads, Terminals, Hall effect
W2S110	4.688 square x 1.5	51, 75 or 110	115, 230	Terminals, Struts on inlet or discharge, Hall effect
W2S115	5.0 square x 1.5	106, 127 or 145	115, 230	Terminals, Hall effect
W2S130	6.0 round x 2	233	115, 230, 115/230	13" leads, Terminals, Hall effect
W2E142	6.0 round x 1.5	175 or 236	115, 230	Terminals, Hall effect
W2S143	6.75 round x 2	195	115, 230	10" leads, Terminals, Hall effect
W2E143	6.75 round x 2	265	115, 230	Terminals, Hall effect

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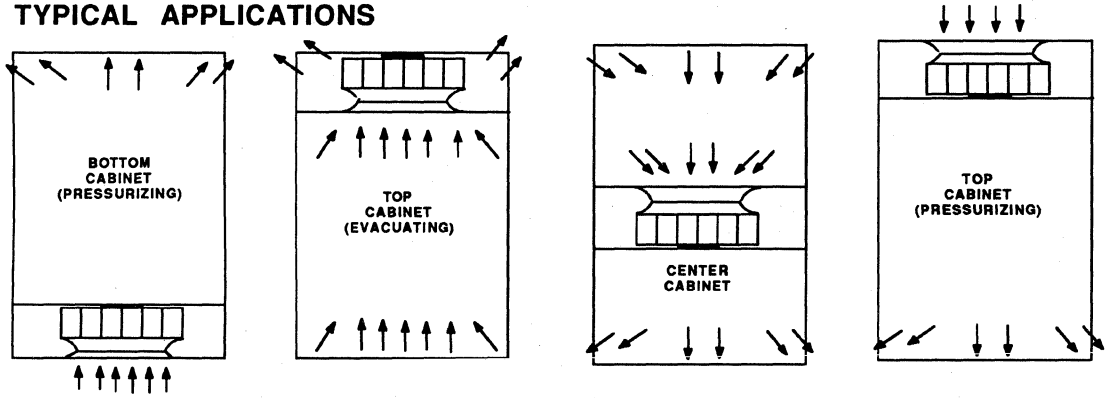
Backward Curved Motorized Impellers

Proven performers in a variety of electronic applications. Air discharge of 360° around the impeller permits innovative air moving designs and excellent performance even against higher pressures.

- Sizes: 5" to 28".
- CFM's: 75 to 10,800.
- Watts: 20 to 2650.
- AC or Brushless DC.

Backward curved motorized impellers should be considered when noise is an important design factor. Noise levels are generally lower and the sound spectrum is less annoying and less interruptive to the ear. These blowers are available in either AC or brushless DC models and feature ebm's Uni-struct™ construction which assures long-life, vibration-free performance.

TYPICAL APPLICATIONS



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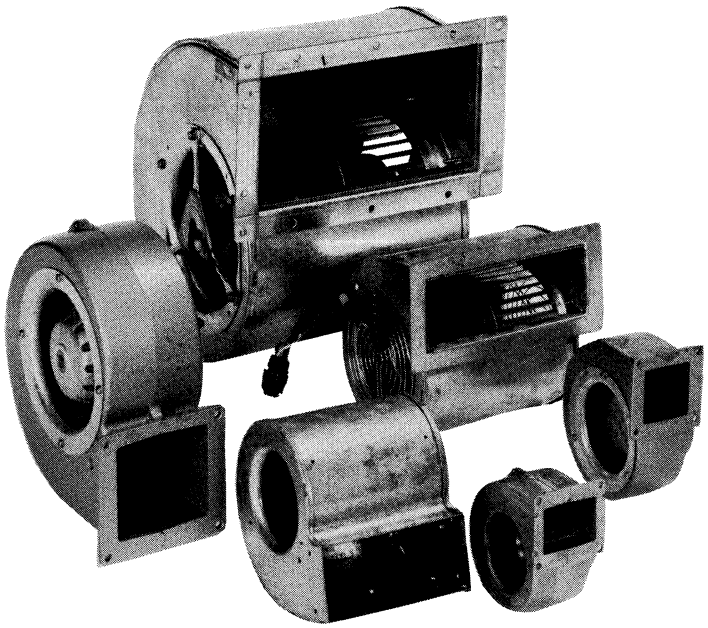
Centrifugal Blowers

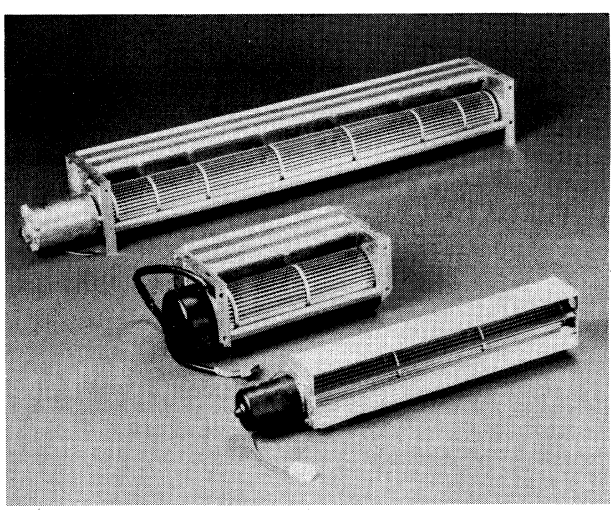
Either single or dual inlet versions in AC or Brushless DC



- Small, compact size with external rotor motors inside the impellers.
- AC or Brushless DC models.
- All units dynamically balanced and 100% tested.
- Speed control by voltage reduction does not affect reliability or performance.
- Sizes: 4" to 20".
- CFM's: 30 to 2800.
- Watts: 30 to 1800.

Crossflow Blowers

Wide, even distribution of cooling air over surfaces to be cooled



- Small, compact size.
- Motor does not affect air flow.
- High efficiency, long-life motors.
- Guide vane design reduces noise.
- Impelled Diameters: 1-1/6" to 4".
- Widths: 7-3/4" to 40".
- CFM's: 44 to 950.
- Miniature DC Crossflows Blowers are excellent for desk top electronics.

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Air Conditioners & Heat Exchangers

Filterless, Dripless cooling keeps electronics clean & cool in dusty, dirty environments. Mount inside or outside cabinet. Manufactured and patented by Seifert, all units are exceptionally well built for long, trouble-free service life.

- Narrow, compact profiles (4-1/4" to 6-1/8").
- Two closed-loop circulation systems.
- Fit existing cabinets & new designs.
- Heat dissipation to 3,000 watts (10,000 BTU).
- Long service life with minimum maintenance.
- Electronic humidity control available.
- Air-to-air or water cooled heat exchangers maintain ambient temperature.

		Cooling Capacity		
Type	Dimensions (in.)	BTU/Hr.	Watts	Volts
KG-4166	20.5h x 10.6h x 4.3	1,200	300	115, 230
KG-4167	12.6h x 20.5w x 4.3	1,200	300	115, 230
KG-4169	24.6h x 12.6w x 4.3	1,400	400	115, 230
KG-4163	32h x 18w x 6.125	3,000	900	115, 230
KG-4160	43.375h x 18w x 6.125	5,600	1,650	115, 230
KG-4550	23.625h x 15.75w x 15.75	5,600	1,650	115, 230
KG-4162	61h x 18w x 6.125	10,000	3,000	115, 230

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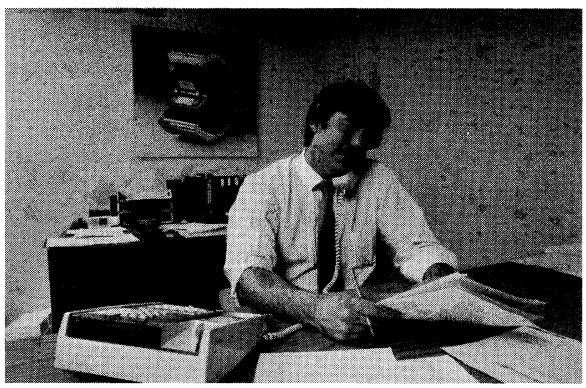
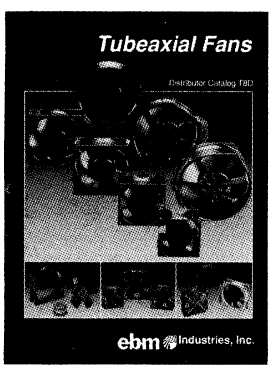
Technical Support on Cooling Devices

FREE Consultation with an engineer 203-674-1515

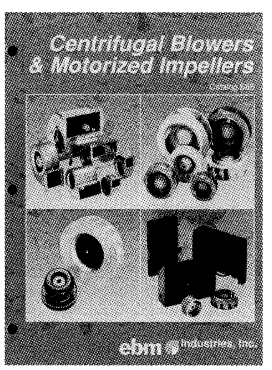


Because ebm sells all types of air moving devices, our engineers have the experience and understanding to objectively help you find the best solution for your application. We have a complete testing laboratory to provide you with specific performance information. Our application engineers are always ready to assist you. Please call us during business hours (eastern time) at 203-674-1515 or fax us your request at 203-674-8536.

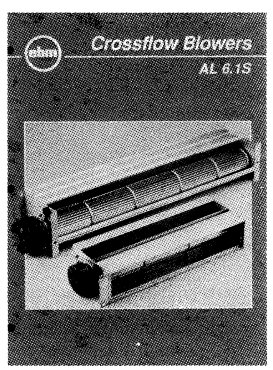
FREE Literature –



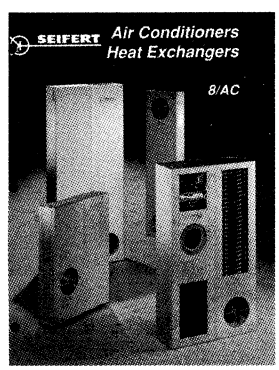
Tubeaxial Fans



Centrifugal Blowers & Motorized Impellers



Crossflow Blowers



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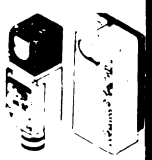
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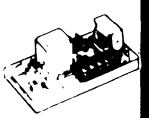
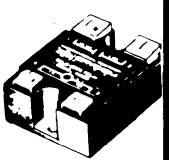
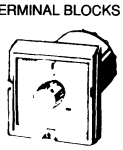
RELAYS


LIQUID LEVEL CONTROLS


SOLID STATE RELAYS

TERMINAL BLOCKS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CIRCUIT BREAKERS FUSES & FUSEHOLDERS

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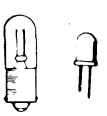
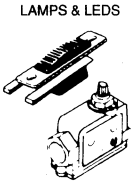
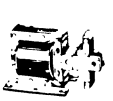

LAMPS & LEDS


SWITCHES

RELAYS

INDICATOR LIGHTS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SOCKETS

OVER 8,000,000 RELAYS & SWITCHES IN STOCK

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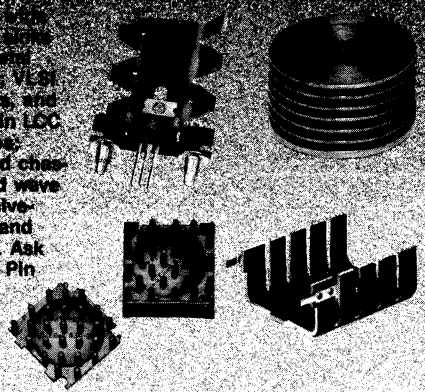
THERMAL MANAGEMENT FROM 1 TO 10,000 WATTS

FOR SEMICONDUCTORS, POWER TRANSISTORS, PC BOARDS, SYSTEM-LEVEL COOLING

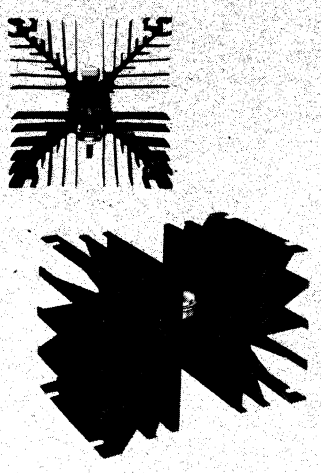
Standard Heat Sinks

Choose from our wide selection of heat sinks for plastic and metal power transistors, VLSI gate arrays, ASICs, and microprocessors in LCC and PGA packages; device, board, and chassis mounting; and wave solderable, adhesive-mount, snap-on, and press-on designs. Ask about our unique Pin Fin designs for LCC and PGA packages.



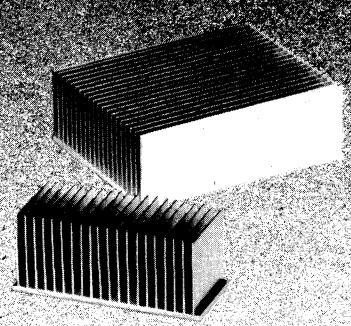
Extruded Heat Sinks and Extrusions

Choose from hundreds of existing shapes and sizes. Or, let us design that unique shape you need to optimize performance and cost. From design to finished heat sinks, and from small prototype quantities to large production quantities, our capabilities can meet all your requirements.



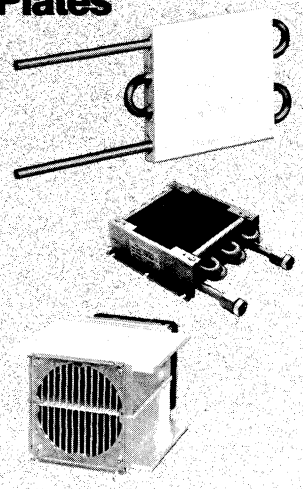
Heat Sinks

Choose from a variety of unique high fin density extrusions to provide maximum cooling efficiency per unit volume. These heat sinks give the same cooling performance as other heat sinks using nearly twice as much space. High fin density heat sinks provide maximum surface area and performance with relatively low weight.



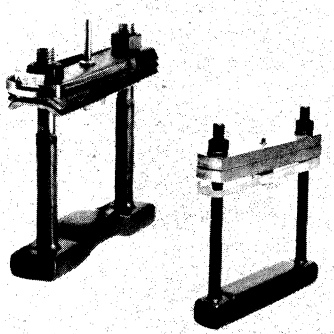
Heat Exchangers and Liquid Cooled Plates

Choose from a variety of liquid cooling and forced convection devices to provide safe temperature levels of densely packed semiconductors. We offer high pressure tube and fin type units (150 psi) made of copper tubes and fins mounted into an aluminum frame. Low pressure (15 psi) cellular type units provide excellent thermal performance while exhibiting very low pressure losses on both the air and water circuits. We offer custom design and manufacturing capability of compact high performance units to meet your requirements.



Mounting Clamps

Choose from clamps with compression ratings from 800 to 16,000 psi. These mounting clamps are for industry-standard compression rectifiers and SCR's. Unique force indicators provide direct reading of clamping force. All clamps are accurately centered giving uniform pressure. A variety of standard heat sinks are available for use with these mounting clamps.



Accessories

Choose from a wide selection of accessories to facilitate the installation and improve the thermal performance of both standard and custom heat sinks. We offer thermally conductive insulators, thermal joint compound, mounting hardware, Sync-Nut™ (insulated and non-insulated) wave-solderable locknuts, epoxy systems, and installation tools.

Call our Application Engineering Department Today at (617) 245-5900 for all Your Standard and Custom Cooling Products, Clamps, and Accessories.

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Components Division
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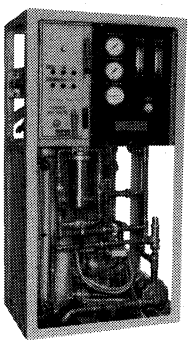
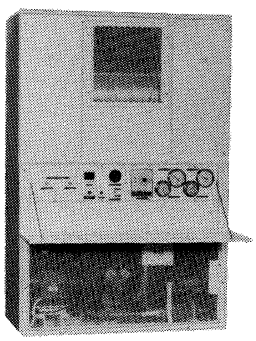
Electro IMPULSE, INC.

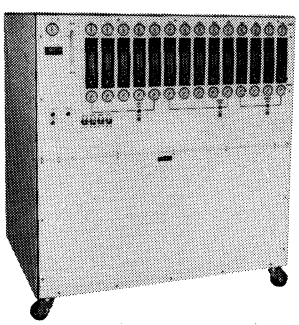
EXCELLENCE IN ENGINEERING SINCE 1949



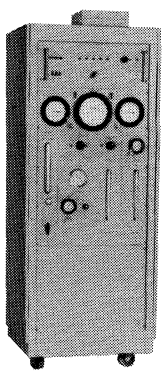
Shipboard Seawater to ETH/Water. H/E cools advanced radar system.



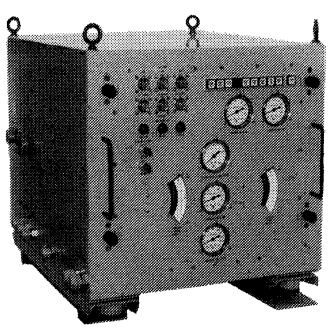
Outdoor Mobile Heat Exchanger.



14 Path Cooling Unit with full instrumentation.



Coolanol to Air Military Heat Exchanger.



Shipboard Coolanol to Water Heat Exchanger for Missile Fire Control System.

Closed Loop Cooling Systems

Self contained cooling packages for a wide variety of applications which allow user to

- **ELIMINATE TAP WATER**
- **CONTROL COOLANT QUALITY**
- **CONTROL COOLANT TEMPERATURES**
- **REDUCE COSTS**
- **IMPROVE PERFORMANCE OF EQUIPMENT**

HIGHEST QUALITY Industrial/Military Packages designed for long life/minimum maintenance.

UNITS AVAILABLE to circulate/cool air, water, coolanols, flourocarbons, hydraulic fluids, or any exotic coolants.

SEALED COOLANT SYSTEMS allow for high degree of purity: Filters, De-Ionizer Systems available.

HIGHLY EFFICIENT HEAT EXCHANGERS keep operating power to a minimum. Hot air exhausts can be used for space heating.

EXCELLENT TEMPERATURE CONTROL utilizing state of the art technology.

WIDE VARIETY OF OPTIONS available for monitoring, interlocking, controls, logic interfaces — customize a unit as you want it.

WRITE FOR COMPLETE INFORMATION

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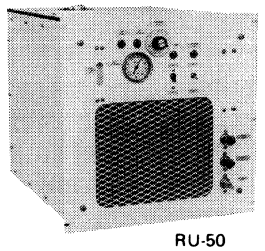
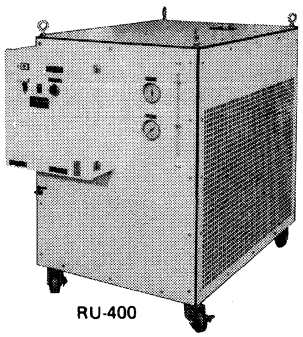
SEE OUR OTHER PRODUCTS ON PAGE D•1243

RU Series Refrigerated Liquid Cooling System



RU-50



RU-400

with Built-In Circulating System Air or Water Cooled Condenser

General Purpose Refrigerated Package for

- Water or Special Coolants.
- Sealed Refrigeration System features high efficiency liquid to freon heat exchanger and hot gas bypass system for close temperature control and freeze protection.
- Wide variety of options available.
- Easy Installation – connect inlet and discharge lines to heat load, connect line power and interlock (if desired), and fill system with coolant.

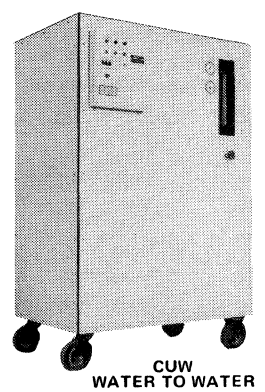
TYPICAL SPECIFICATIONS OF STANDARD UNITS

Model	Amb. 70°F Capacity Watts Water @ 65°F	GPM Flow at 50 PSIG	Std. Op. Voltage	Size L x W x H	Wt. Lbs.
RU-50	1600	1.5	115/1/60	23x17x16	160
RU-75	2400	1.5	208/230-1-60	25x25x37	175
RU-100	3200	1.5	208/230-1-60	25x25x37	200
RU-200	8000	4	208/230-1-60	36x26x35	460
RU-300	12,600	4	208/230-3-60	36x26x35	465
RU-400	16,000	4	208/230-3-60	36x26x35	485
RU-500	20,000	8	208/230-3-60	36x26x35	510
RU-750	30,000	8	208/230-3-60	36x26x70	650
RU-1000	40,000	10	208/230-3-60	36x26x70	750

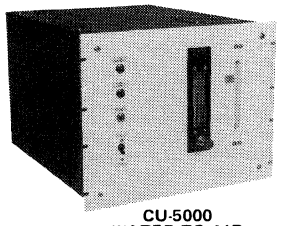
Capacities/Ratings are for water – consult factory for other coolants.
Table above represents typical values only – consult factory for different flow rates, voltage, capacity, etc.
Specifications subject to change without notice.

Electro IMPULSE, INC.

CU Series Liquid to Air or CUW Series Liquid to Liquid



CUW
WATER TO WATER



CU-5000
WATER TO AIR

Non Refrigerated Heat Exchangers

- Use where coolant temperatures are not critical and may be slightly above ambient (or tap water).
- Tap water cooled units allow circulation of controlled, high purity water or other coolant in a closed loop with high efficiency.

TYPICAL SPECIFICATIONS OF STANDARD UNITS

Model	Water Temp. Rise °F/KW Over Ambient	GPM Flow at 50 PSIG	Std. Op. Voltage	Size L x W x H	Wt. Lbs.
CU-500	20	.5	115/1/60	10x19x20	60
CU-5000	5	1.5	115/1/60	23x17x14*	75
CU-10,000	3.5	4.0	115/1/60	28x20x20	150
CU-20,000	1.75	4.0	208/230-1-60	25x24x35	250
CU-30,000	1.0	4.0	208/230-1-60	23x29x47	210
CU-50,000	0.5	12	208/230-1-60	29x44x71	500
CU-80,000	0.4	15	208/230-3-60	29x53x71	600
CU-100,000	0.3	20	208/230-3-60	29x84x71	900

Capacities/Ratings are for water – consult factory for other coolants.
Table above represents typical values only – consult factory for different flow rates, voltage, capacity, etc.
Specifications subject to change without notice.

*19" Rack Mount

Electro IMPULSE, INC.
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Telephone: 201-741-0404 TWX No. 7107225717
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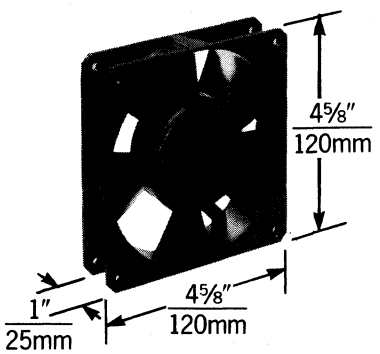
ETRI® tube

ETRI has long been a leader in the design of air-moving devices, from large mine ventilators to miniature flat axial fans. Today, ETRI® air movers are cooling and protecting the most sophisticated of electronic packages. Throughout this time, our basic commitment to uncompromising quality and high performance standards has not changed. Our history of innovative designs and materials, coupled with precise manufacturing techniques provide you with an efficient, quality product for long maintenance-free operation.

Model 98 BDC

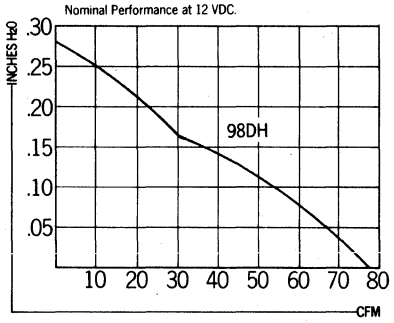


- Polarity and locked rotor protected
- Wide operational voltage/speed range 8-16 volts
- Complies with UL, CSA, VDE and FCC requirements
- Wire leads or terminals
- 12 or 24 volt, ball or sleeve bearing versions
- Operational monitor option
- 94V-0 rated plastics

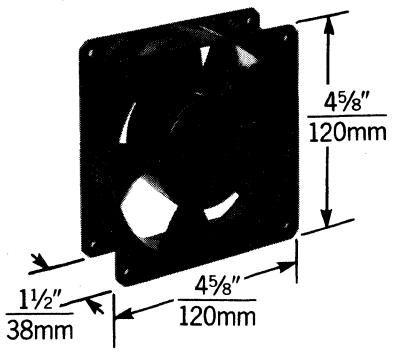
MODEL NUMBER	VDC	INPUT POWER (W)	LINE CURRENT (A)	RPM	NOISE dBSIL	AIR FLOW (CFM/ls)
98DH 1LM 31000	12	4.5	.38	3,000	39	81/38

All fans described above are 12 volt sleeve bearing standard models.

Nominal Performance at 12 VDC.



Model 125 BDC

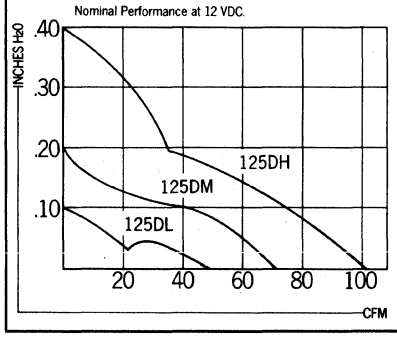


- High volume/pressure or low volume/low noise
- Three speed versions available in 12, 24 or 48 VDC
- Metal or 94V-0 plastic housing
- Polarity and locked rotor protected
- Wire leads or standard terminals
- Wide operational voltage/speed range 8-16 volts
- Operational monitor option

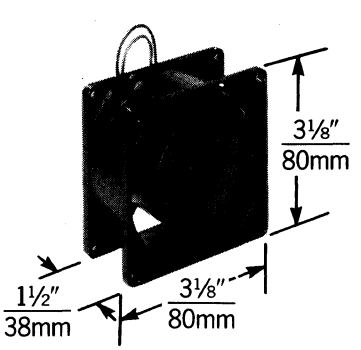
MODEL NUMBER	VDC	INPUT POWER (W)	LINE CURRENT (A)	RPM	NOISE dBSIL	AIR FLOW (CFM/ls)
125DL 1TM 21000	12	1.5	.125	1500	21	49/23
125DM 1TM 21000	12	2.6	.22	2200	33	72/34
125DH 1TM 21000	12	6.5	.54	3100	41	105/49

All fans described above are 12 volt, sleeve bearing, standard models.

Nominal Performance at 12 VDC.



Model 126 BDC

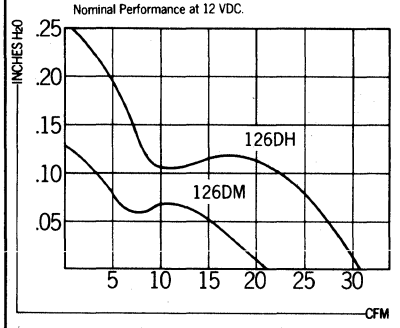


- High performance and low noise
- Polarity and locked rotor protected
- Two speed versions available in 12 and 24 VDC
- 94V-0 plastic housing, total weight 7.75 oz.
- Wire leads or terminals
- Wide operational voltage/speed range 8-16 volts
- Operational monitor option
- Complies with UL, CSA, VDE and FCC requirements

MODEL NUMBER	VDC	INPUT POWER (W)	LINE CURRENT (A)	RPM	NOISE dBSIL	AIR FLOW (CFM/ls)
126DH 1LP 31000	12	3.1	.260	3600	30	32/15
126DM 1LP 31000	12	1.5	.125	2500	23	22/10

All fans described above are 12 volt, sleeve bearing standard models.

Nominal Performance at 12 VDC.



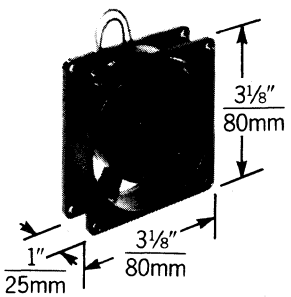
ETRI®

ETRI/1503 Rocky River Rd., North/Monroe, NC 28110/FAX 704-283-7170 (704) 289-5423

axial fans.

ETRI's new line of Brushless DC fans offers the design engineer a wide range of product. Options in various voltages, speeds, bearing systems and termination configurations allows the engineer to precisely select the performance for his particular application. All ETRI BDC units are designed and manufactured to comply with UL, CSA, VDE and FCC requirements. Whether you select our Brushless DC or AC products (following pages) your assurance of dependable air moving performance is backed up by our 40 years of air moving experience.

Model 146 BDC

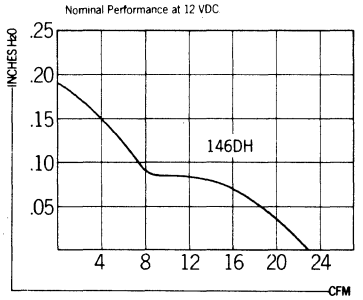


- High performance, low noise
- 94V-O plastic housing, total weight 4.5 oz.
- Sleeve or ball bearing 12 or 24 VDC
- Wire leads or terminals
- Polarity and locked rotor protected
- Complies with UL, CSA, VDE and FCC requirements
- Wide operational voltage/speed range 8-16 volts.

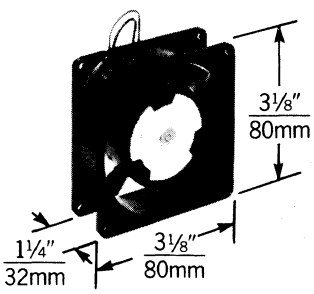
MODEL NUMBER	VDC	INPUT POWER (W)	LINE CURRENT (A)	RPM	NOISE dBS/L	AIR FLOW (CFM/l/s)
146DH 1LP 31000	12	1.8	.15	3250	25	23/10.6

All fans described above are 12 volt, sleeve bearing standard models.

Nominal Performance at 12 VDC



Model 159 BDC

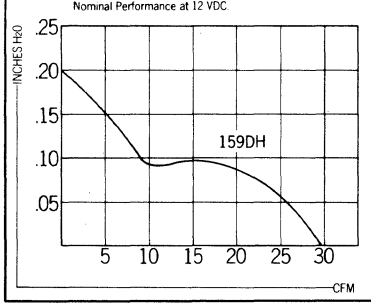


- Unprecedented low noise levels in 80 x 80 x 32mm fan
- Complies with UL, CSA, VDE and FCC requirements
- 94V-O plastic housing total weight 7 oz.
- Wire leads or terminals
- 12 and 24 VDC versions, sleeve or ball bearing
- Wide operational voltage/speed range 8-16 volts

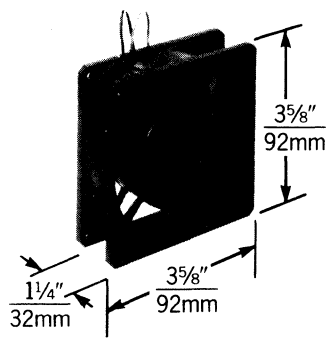
MODEL NUMBER	VDC	INPUT POWER (W)	LINE CURRENT (A)	RPM	NOISE dBS/L	AIR FLOW (CFM/l/s)
159DH 1LP 31000	12	2.2	.18	3600	23	29/14

All fans described above are 12 volt, sleeve bearing standard models.

Nominal Performance at 12 VDC



Model 162 BDC

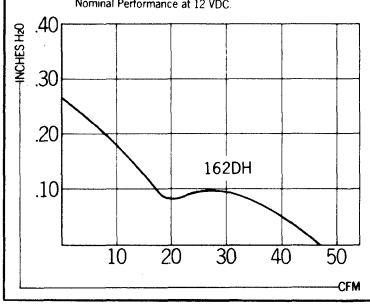


- 92 x 92 x 32mm, 45 CFM, 31dB
- 94V-O plastic housing total weight 7.75 oz.
- Wire leads or terminals
- Polarity and locked rotor protected
- Sleeve or ball bearings
- High performance low noise
- Wide operational voltage/speed range
- Complies with UL, CSA, VDE and FCC requirements

MODEL NUMBER	VDC	INPUT POWER (W)	LINE CURRENT (A)	RPM	NOISE dBS/L	AIR FLOW (CFM/l/s)
162DH 1LP 31000	12	3.4	.28	3200	31	45/21

All fans described above are 12 volt, sleeve bearing standard models.

Nominal Performance at 12 VDC



ETRI®

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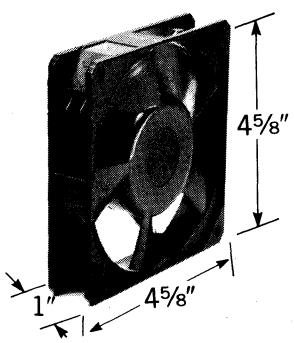
ETRI® tube

ETRI's popular-sized AC fans utilize rugged die cast housings for strength and durability. Glass-filled thermoplastic impellers (94V-O rated) are heat-stable and resistant to breakage. Rotors are lightweight and precision balanced for vibration-free operation. Bearings (either sleeve or ball) are

MODEL 98

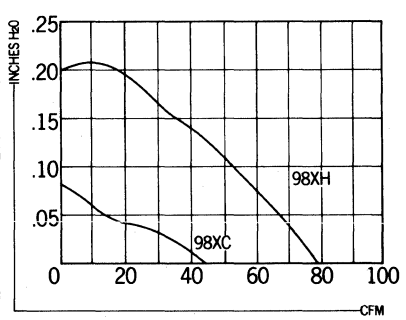


High volume/pressure performance where space is at a premium.

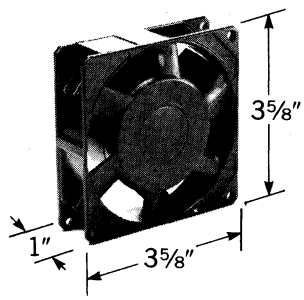
- Unique 1" thin profile on 4⅝" fan.
- Two RPM versions available.
- Available in either sleeve or ball bearing construction.
- Precision engineered blade-to-venturi fit.
- Low input power—as low as 10 watts.
- UL recognized/CSA certified.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
98XC-2182	115	60	10	110	1700	21	45
98XC-2181	220	60	12	70	1700	21	45
98XH-2182	115	60	11	110	3000	37	79
98XH-2181	220	60	13	65	3000	37	79

Model numbers shown are for sleeve bearing versions. To order ball bearing fans, omit the first "2" from the last group of digits.



MODEL 99

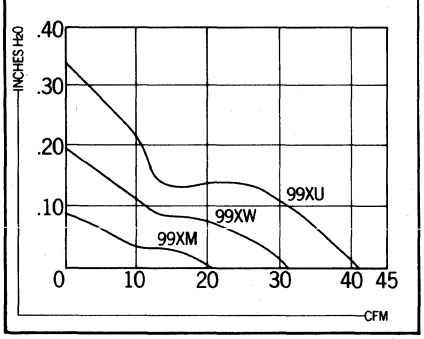


Slim 1" profile takes up less behind-the-panel space.

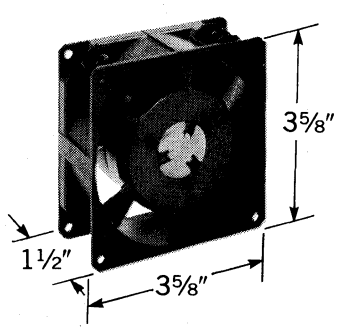
- Three different speed models in two voltage versions.
- Noise levels as low as 23 db (sil).
- True airfoil impeller blades move more air.
- Convenient standard terminals.
- Precision balanced lightweight rotor for longer vibration-free work life.
- UL recognized/CSA approved/VDE listed.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
99XM-2182	115	60	6	65	1700	19	21
99XM-2181	220	60	7	35	1700	19	21
99XW-2182	115	60	6	70	2500	26	32
99XW-2181	220	60	7	40	2500	26	32
99XU-2182	115	60	9	105	3200	33	40
99XU-2181	220	60	11	60	3200	33	40

Model numbers shown are for sleeve bearing versions. To order ball bearing fans, omit the first "2" from the last group of digits.



MODEL 113

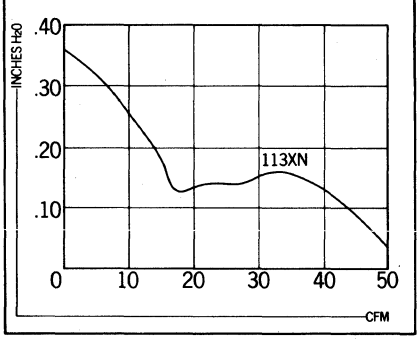


An intermediate size fan. Ideal for power supply applications.

- 3.25" mounting centers.
- Quiet, efficient operation with maximum volume/pressure delivery.
- 94V-O rated glass-filled impeller is heat-stable with high resistance to breakage.
- Available in either sleeve or ball bearing construction.
- UL recognized/CSA approved.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
113XN-2182	115	60	11	135	3300	35	53
113XN-2181	220	60	12	80	3300	35	53

Model numbers shown are for sleeve bearing versions. To order ball bearing fans, omit the first "2" from the last group of digits.



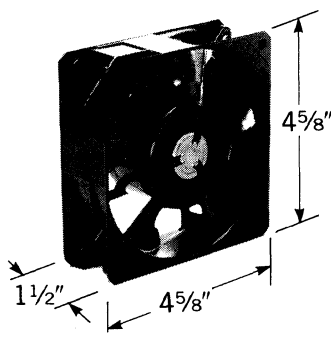
ETRI®

ETRI/1503 Rocky River Rd., North/Monroe, NC 28110/FAX 704-283-7170 (704) 289-5423

axial fans.

lifetime lubricated. All models operate efficiently at 50Hz or 60Hz and most are available in either 115VAC or 220VAC. Every model is UL Recognized (file E64887) and CSA Certified (file 43861). Many models are VDE approved. For more information call ETRI at 704/289-5423.

MODEL 125

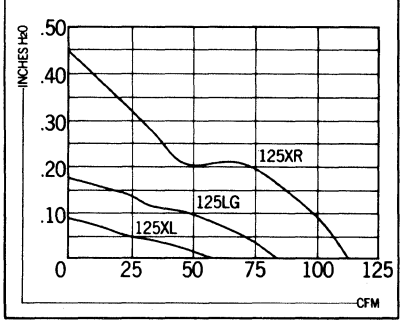


Extremely effective in high density applications where high pressure performance is required.

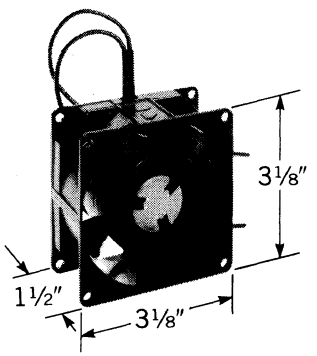
- Develops 90 CFM at .15" H O and 75 CFM at .2" H O.
- Can replace two conventional fans in demanding applications.
- Produces highest volume of air per watt of power of any fan of its type.
- Available in either sleeve or ball bearing construction.
- UL recognized CSA certified.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
125XL-2282	115	60	10	115	1650	29	57
125XL-2281	220	60	10	65	1650	29	57
125LG-2282	115	60	13	160	2400	36	83
125LG-2281	220	60	15	90	2400	36	83
125XR-2282	115	60	15	180	3250	40	112
125XR-2281	220	60	15	105	3250	40	112

Model numbers shown are for sleeve bearing versions. To order full bearing fans, omit the first "2" from the last group of digits.



MODEL 126

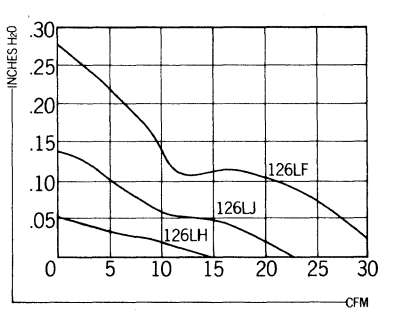


Low input power, low noise, high performance in this fan package.

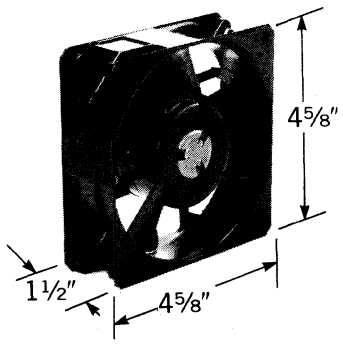
- 2.81" mounting centers.
- Very quiet operation—only 8 db (sil) on Model 126LH.
- Wire leads or terminal version.
- Three different RPM models.
- Available in either sleeve or ball bearing construction.
- UL recognized/CSA certified/VDE listed.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
126LH-2182	115	60	3	40	1550	9	15
126LJ-2182	115	60	5	60	2400	19	23
126LF-2182	115	60	8	100	3200	26	32
126LF-2181	220	60	8	60	3200	26	32

Model numbers shown are for sleeve bearing versions. To order full bearing fans, omit the first "2" from the last group of digits.



MODEL 141

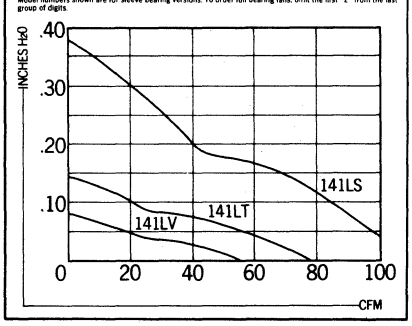


105, 75, and 55 CFM versions are available in this most popular size fan.

- 4.125" mounting centers and standard terminal configuration.
- Low power consumption—only 8 watts on 141LV model.
- Tight blade-to-venturi fit assures optimum performance.
- Available in either sleeve or ball bearing construction.
- UL recognized/CSA certified/VDE listed.
- Reverse flow models available.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
141LV-2282	115	60	8	100	1700	23	55
141LV-2281	220	60	9	55	1700	23	55
141LT-2282	115	60	9	110	2300	33	75
141LT-2281	220	60	10	65	2400	33	75
141LS-2282	115	60	12	140	3200	41	105
141LS-2281	220	60	12	80	3200	41	105

Model numbers shown are for sleeve bearing versions. To order full bearing fans, omit the first "2" from the last group of digits.



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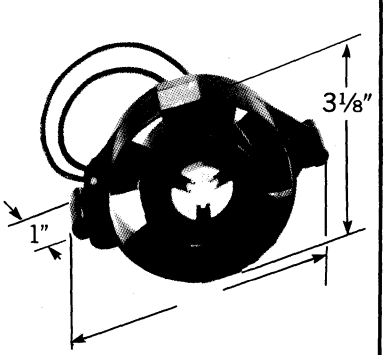
ETRI® fans

ETRI's flat tubeaxial fans are quiet, efficient, cost effective components that are ideal for most electronic cooling applications. For complete technical specifications and delivery information call the ETRI factory at (704) 289-5423.

and accessories.

Accessory items assure correct fit on ETRI fans. Finger Guards will retro fit most existing fans.

MODEL 146

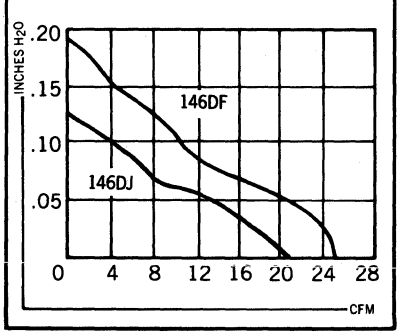


3" x 1" fan specially designed for desk-top electronic applications

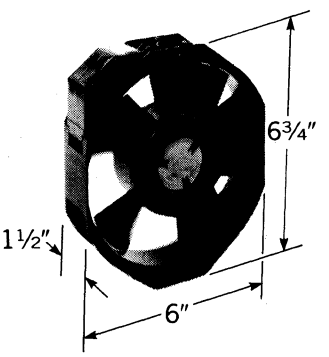
- Low acoustical levels.
- 25 CFM at free air delivery.
- Simplified time saving mounting with bosses and speed nuts provides real economy for high volume installation.
- 115 or 220 volt.
- UL recognized/CSA certified/VDE approved.
- Will fit 3⅛" designs in a 1" profile.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
146DJ-2182	115	60	5	60	2600	23	21
146DF-2182	115	60	5	60	3100	24.7	25
146DF-2181	220	60	9	50	3100	24.7	25

Model numbers shown are for sleeve bearing versions. To order ball bearing fans, omit the first "2" from the last group of digits.



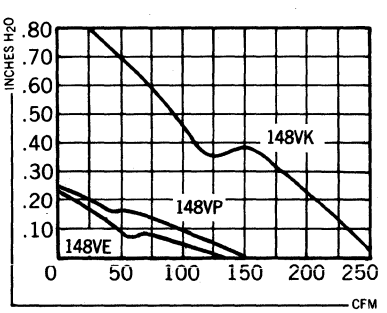
MODEL 148



Ideal for high pressure/high flow applications. Develops 180 CFM at .3" H_2O.

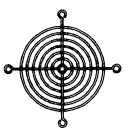
- 1½" thick—less than most 6" fans.
- Efficient, permanent split-capacitor motor, thermally protected.
- Pre-loaded ABEC-3, double-shielded, ball bearing system runs quietly in any position.
- UL recognized/CSA certified.
- Reduced speed versions available.
- Provides wide range cooling with low acoustical disturbances.

PART NUMBER	VOLT (V)	FREQ (Hz)	POWER INPUT (W)	CURRENT INPUT (ma)	SPEED (RPM)	NOISE LEVEL SIL/dB	FREE AIR DELIVERY (CFM)
148VE282	115	60	11	90	1650	33	123
148VE281	220	60	14	80	1650	33	123
148VP282	115	60	18	160	2100	39	149
148VP281	220	60	22	100	2350	45	172
148VK282	115	60	32	270	3300	51	255
148VK281	220	60	33	170	3200	50.5	255



FINGER GUARDS

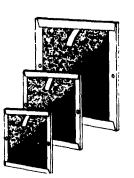
Ensures safe operation in situations that require guarding.



- Standard mounting centers for versatile installation.
- Meets UL Spacing requirements.
- Sturdy .062" steel wire rings welded to .080" ribs.
- Bright zinc-plated finish.

FILTERS

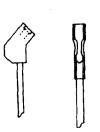
Provides maximum air flow while permitting effective filtering.



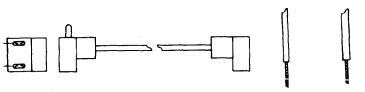
- Expanded/slit aluminum foil traps dust particles.
- Minimum pressure loss.
- Complies with UL requirements.

CORDS

All cords are UL recognized #18AWG wire.



- Black SPT-1 type wire in several lengths.



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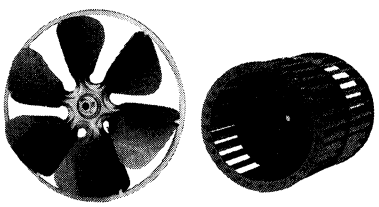
hi-tech

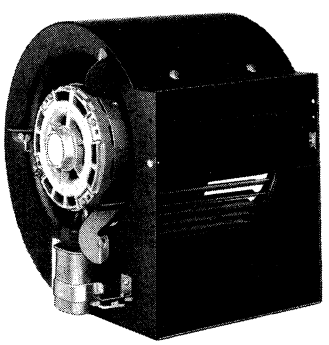
Your back-up source for fans, blowers and components

When you need an alternate source you need them now! When you need assistance with a custom fan or blower you need it now. Hi-Tech will provide bend-over-backwards service plus first line quality and uncompromising product reliability. Just tell us your needs.

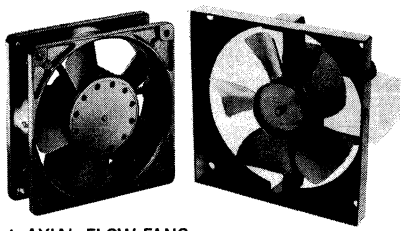
NOW AVAILABLE:



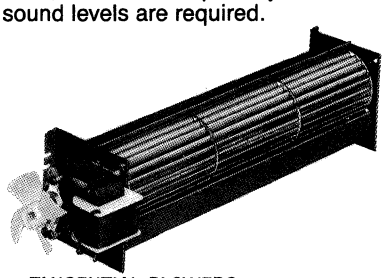
▲WHEELS AND BLADES
Hi-Tech now offers fan wheels and blades the *way* you want them, *when* you want them, in the quantities you *specify* and with statistical evidence of quality.



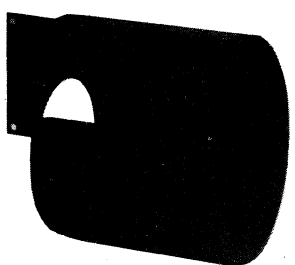
▲SINGLE/DUAL CENTRIFUGAL BLOWERS
Smooth vibration-free performance is assured with balanced wheels and motors. Single and three-phase UL approved motors. Static pressures to 3.0″, outputs to 2000 CFM, wheel diameters from 3″ to 12″.



▲AXIAL FLOW FANS
Hi-Tech's axial flow fans are the economical solution for high volume, low static pressure applications; for limited space, spot cooling installations; and where especially low sound levels are required.



▲TANGENTIAL BLOWERS
LAMINA-FLO tangential blowers are designed for low profile, wide outlet installations and feature high CFM, even air flow patterns and extremely quiet operation.



▲BLOWER COMPONENTS
Housings, inlet flanges, cover plates and outlet collars in sizes from 2″ to 13″ are available for prompt delivery. Components can be furnished unpainted or with a durable flat black finish. Other finishes available.

SPC QUALITY ASSURANCE

hi-tech, inc.

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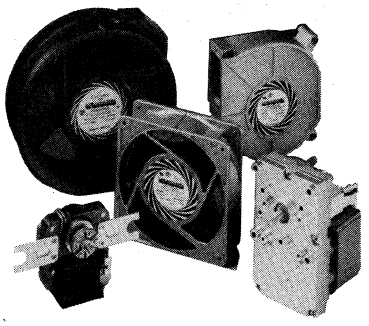
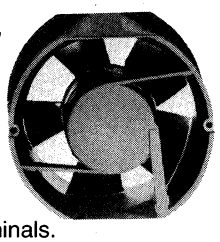
Fifty years young... and still growing strong.

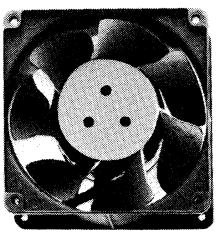
Dependable, innovative Howard has merged Brevel sub-fractional motors and gear motors into our line of AC and DC fans and blowers.



TUBEAXIAL FANS

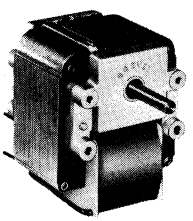
	AC	DC
Sizes:	3", 4½", 6", 10"	60mm, 80mm, 92mm, 120mm
CFM:	17 - 560	10 - 240
Voltage:	115, 230 VAC	12, 24, 48 VDC
Frequency:	50, 60 Hz	. . . .
Approvals:	UL, CSA, VDE	. . . .
Bearings:	Sleeve, Ball	Ball
Applications:	Computers, electronic power supplies, copiers, enclosures, heaters. Available with leads or terminals. Stock items or value-added assemblies.	

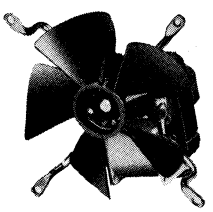




SUB-FRACTIONAL MOTORS

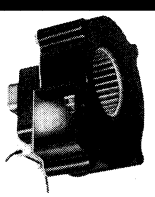
	Unit Bearing	C-Frame
MHP:	1, 2 - 5	2 - 40
RPM:	1800 - 3000	3000
Voltage:	115, 230 VAC	115, 230 VAC
Frequency:	50, 60 Hz	50, 60 Hz
Approvals:	UL, CSA, VDE	. . . .
Bearings:	Sleeve	Sleeve, Ball
Applications:	Refrigeration fans, commercial cooling, heaters, mini-purpose microwaves. Available in multiple mountings suitable for fan usage or light mechanical duty.	

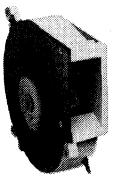




BLOWERS

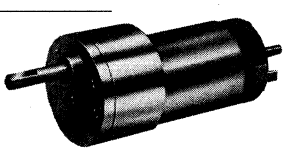
CFM: 14 to 50
Voltage: 115, 230 VAC — 12, 24, 46 VDC
Frequency: 50, 60 Hz
Approvals: UL, CSA (AC only)
Applications: Copiers, fireplace inserts, business machines.

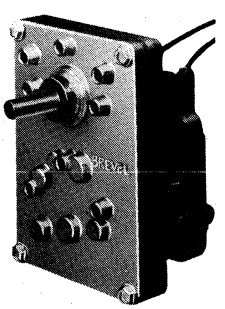




GEARMOTORS

	AC	DC
Full Load RPM:	1 - 400	7 - 250
Full Load Torque:	6 - 125 lb-in.	5 - 125 lb-in.
Voltage:	115, 230 VAC	12 VDC
Frequency:	50, 60 Hz	. . . .
Approvals:	UL, CSA	. . . .
Applications:	Rotisseries, vending machines, ice makers. Multiple mounts available.	





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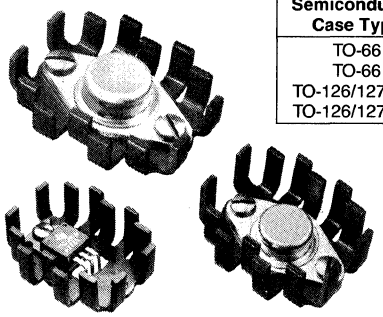
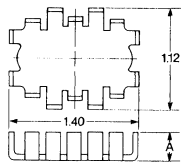
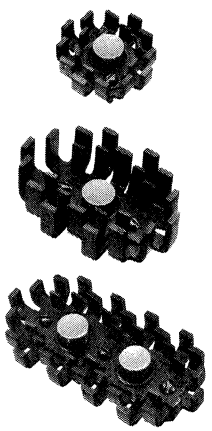
LB Series



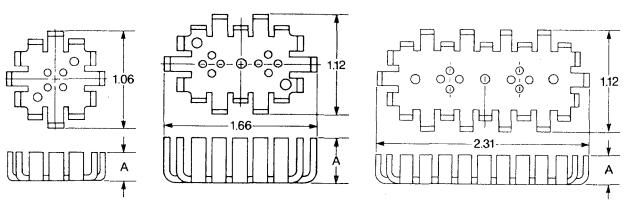
Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-66	19.7	.31
TO-66	17.1	.50
TO-126/127/220	16.5	.50
TO-126/127/220	20.8	.31



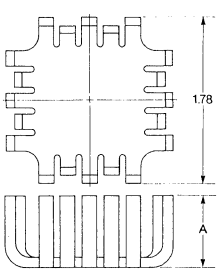
LP Series



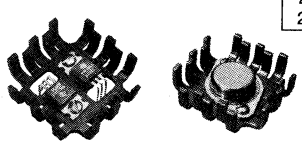
Semiconductor Case Type	θ°C/W.	"A" Dim.
One TO-18	33.0	.50
One TO-18	38.9	.31
Two TO-18s	27.0	.50
Two TO-18s	32.0	.31
One TO-5	23.1	.50
One TO-5	24.2	.31
One TO-5	16.3	.50
One TO-5	19.7	.31
Two TO-5s	15.6	.50
Two TO-5s	20.8	.31
One TO-5	12.6	.50
One TO-5	15.6	.31
Two TO-5s	12.1	.50
Two TO-5s	15.0	.31



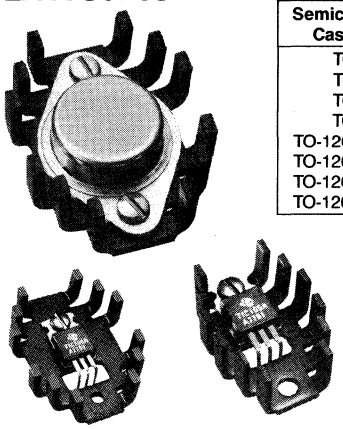
UP, UP1 and UP2 Series



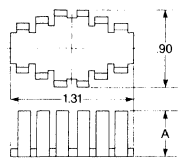
Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-66	11.5	.50
TO-66	9.6	.75
TO-66	7.9	1.00
TO-3	10.4	.50
TO-3	8.3	.75
TO-3	7.1	1.00
TO-126	11.7	.50
TO-126	9.4	.75
TO-126	8.2	1.00
TO-127/220	11.7	.50
TO-127/220	9.4	.75
TO-127/220	8.2	1.00
2 Ea. TO-126 or	10.7	.50
2 Ea. TO-127 or	8.3	.75
2 Ea. TO-220	7.4	1.00



LA-A Series

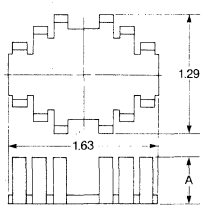


Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-66	28.9	.25
TO-66	19.7	.50
TO-66	16.3	.75
TO-66	14.4	1.00
TO-126/127/220	25.0	.25
TO-126/127/220	20.0	.50
TO-126/127/220	17.0	.75
TO-126/127/220	14.7	1.00

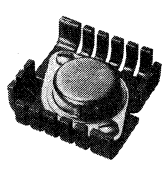


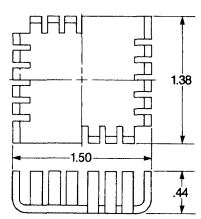
LA-B Series

Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-66	14.3	.50
TO-66	12.1	.75
TO-66	10.7	1.00
TO-66	9.8	1.25
TO-3	14.1	.50
TO-3	12.0	.75
TO-3	10.3	1.00
TO-3	9.3	1.25
Any TO-3	15.3	.50
Any TO-3	12.9	.75
Any TO-3	11.2	1.00
Any TO-3	10.0	1.25
TO-126	15.0	.50
TO-126	12.9	.75
TO-126	11.4	1.00
TO-126	9.7	1.25
TO-127/220	15.0	.50
TO-127/220	12.9	.75
TO-127/220	11.4	1.00
TO-127/220	9.7	1.25

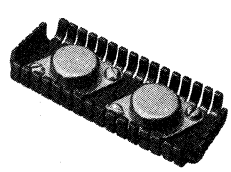


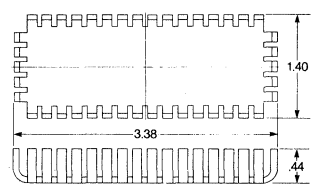
UP3, UP 10 Series





Semiconductor Case Type	θ°C/W.
TO-126	15.0
TO-127/220	15.0
2 Ea. TO-126/127/220	13.6
TO-66	14.2
TO-3	13.6
2 Ea. TO-3	7.7
2 Ea. Universal	—
1 Ea. TO-3	8.7
2 Ea. TO-126/127/220	7.5





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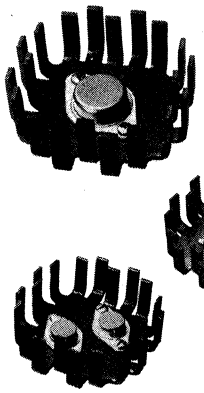
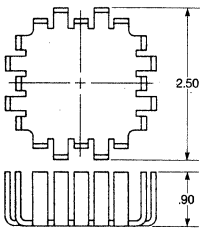
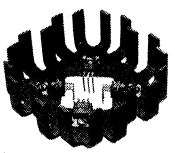
HP1 Series



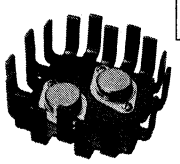
Semiconductor Case Type	θ°C/W.
TO-66	6.0
TO-3	5.4
TO-126	6.5
TO-127/220	6.5
Dual TO-127/220	5.6

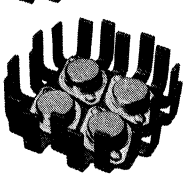


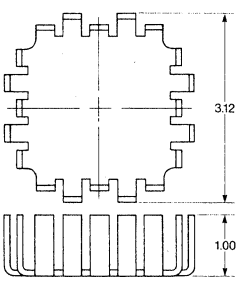
HP3 Series



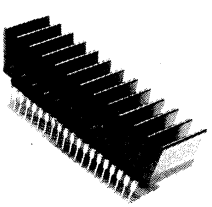
Semiconductor Case Type	θ°C/W.
TO-66	5.0
TO-3	4.4
TO-126	5.0
TO-127/220	5.0
2 Ea. TO-127/220	4.0
4 Ea. TO-127/220	3.7



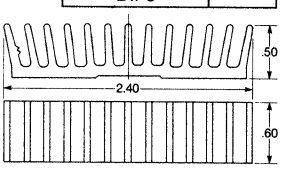


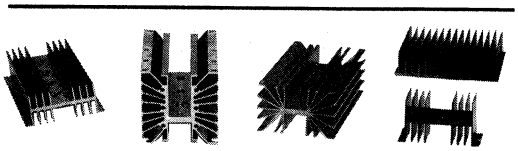


Extruded Dissipator for 40 Pin DIPs



Semiconductor Case Type	θ°C/W.
.600 Wide 40 Pin DIPs	15.5

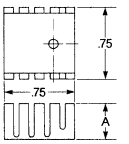




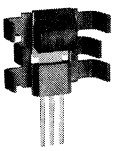
IERC manufacturers an extensive line of extruded heat dissipators—more than 80 standard shapes. Extruded heat dissipators are particularly useful for applications where high power levels are encountered.

PC Series

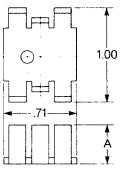
Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-126/127/220	27.3	.38
TO-126/127/220	27.3	.38
TO-126/127/220	22.0	.75
TO-126/127/220	22.0	.75



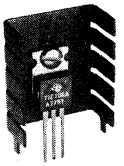
PA Series



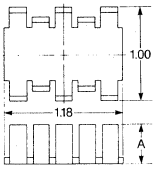
Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-126/127/220	26.8	.50
TO-126/127/220	30.0	.31



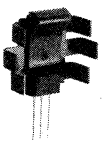
PB Series



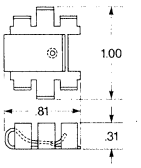
Semiconductor Case Type	θ°C/W.	"A" Dim.
TO-126/127/220	22.1	.50
Dual	—	.50
TO-126/127/220	25.0	.31
TO-126/127/220	—	.31



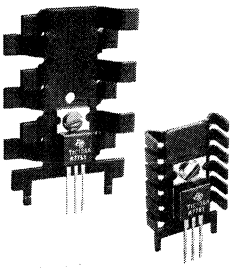
PSC2 Series



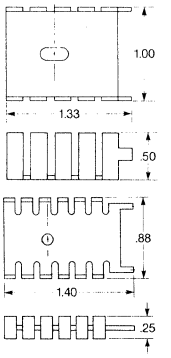
Semiconductor Case Type	θ°C/W.
TO-202	42.9
TO-220	41.7
Mota. 152	46.9
TO-126	45.5
TO-127	37.5



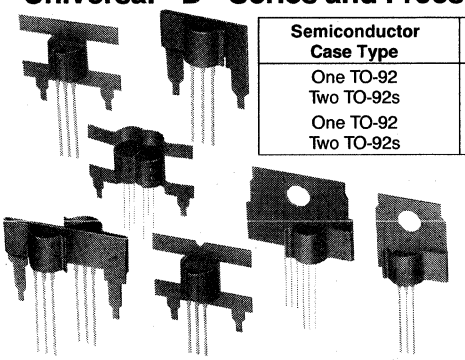
Vertical Tab Mounted Dissipators



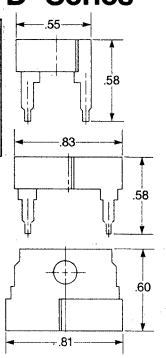
Semiconductor Case Type	θ°C/W.
TO-126/127/220	20.0
TO-126/127/220	25.9
TO-202	17.6
TO-126/127/220	14.4



Universal "D" Series and Freestanding "D"Series



Semiconductor Case Type	θ°C/W.
One TO-92	146.8
Two TO-92s	87.2
One TO-92	140.4
Two TO-92s	74.2



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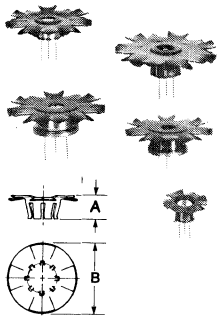
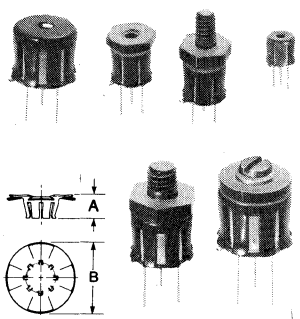
Fan Tops



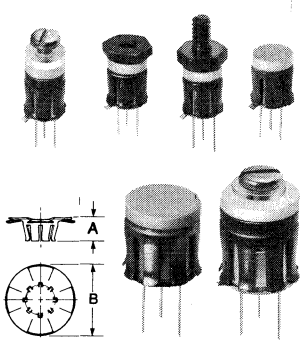
Semiconductor Case Type	θ°C/W.	"A" Dim.	"B" Dim.
TO-18	150.0	.25	.50
TO-18	150.0	.25	.50
TO-5	81.1	.25	.75
TO-5	81.1	.25	.75
TO-5	57.7	.33	1.25
R110 or R97a	150	.25	.50
R110a or R97	—	.25	.75
TO-92	153	.25	.50
R110 or 97a	150	.25	.50
R110a or R97	—	.25	.75
TO-92	153	.25	.50

Thermal Link Retainers Without BeO Insulators



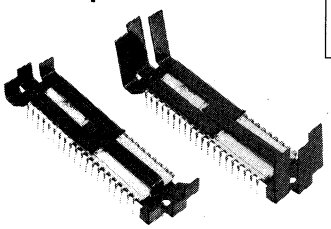
Semiconductor Case Type	"A" Dim.	"B" Dim.
TO-18	.23	.43
TO-5	.25	.56
TO-18	.21	.22
TO-5	.31	.37
TO-18	.28	.22
TO-5	.37	.37
TO-18	.50	.25
TO-18	.50	.25
TO-5	.59	.37
TO-5	.59	.37
TO-18	.28	.25
TO-5	.41	.37

Thermal Link Retainers With BeO Insulators

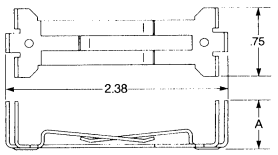


Semiconductor Case Type	"A" Dim.	"B" Dim.
TO-18	.34	.22
TO-18	.34	.22
TO-5	.43	.38
TO-5	.43	.38
TO-18	.27	.22
TO-5	.37	.30
TO-18	.56	.25
TO-18	.56	.25
TO-5	.65	.38
TO-5	.65	.38
TO-18	.34	.25
TO-5	.47	.38

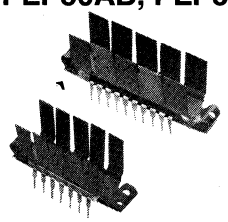
Micro Clip Dissipators



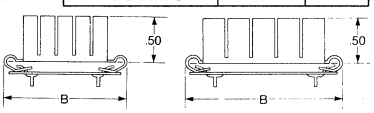
Semiconductor Case Type	θ°C/W.	"A" Dim.
.600 Wide DIPs with 24-40 Pins	25.9 22.9 22.7	.25 .50 .75



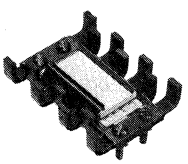
PEP50AB, PEP50BB



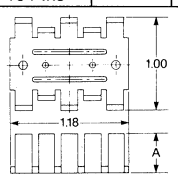
Semiconductor Case Type	θ°C/W.	"B" Dim.
.300 Wide DIP 14-16 Pins	23.8	1.30
.300 Wide DIP 14-24 Pins	20.8	1.70



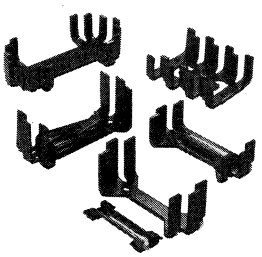
PB-10 Series



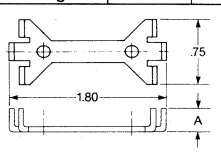
Semiconductor Case Type	θ°C/W.	"A" Dim.
.300 Wide DIPs with up to 16 Pins	27.8 30.0	.50 .37



LIC Series



Semiconductor Case Type	θ°C/W.	"A" Dim.
.300 Wide Dips less than .700 long	28.9 26.3 23.7 22.2	.25 .50 .75 1.00



THERMAL PACKAGING PRODUCTS

ZIF

High performance *Zero Insertion Force (ZIF) circuit board retainers* for military electronics.

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Extruded aluminum plates incorporating ZIF retainers. Provides optional cooling and structural support for circuit boards.

SEM Cages

Standard Electronic Module (SEM) cages designed to provide economic packaging meeting all military objectives for the SEM Program.

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ELINA DC FANS

FDC SERIES—EFFICIENT COOLING TYPE

DC BRUSHLESS MOTOR FAN

- Durable die cast aluminum venturi
- PBT or Polycarbonate impeller of UL94V-0 material
- Choice of two to three speeds to satisfy various applications
- Lead Wire Type (UL1007, CSA TR64, AWG24, 12 inches)
- Locked Rotor/Polarity protected

Size	Type	Model	Rated Voltage	Operating Voltage	Rated Current	Rated Input	Rated Speed	Max. Airflow	Max. Static Pressure	Noise Level	Weight	Bearing
Inch (mm)			VDC	VDC	mA	W	rpm	CFM	inchAq	dB(A) at 1m	oz	
1.6 x 1.6 x 0.8	Low Speed	**FDC 40-05L**	5	4.5-8	190	1.0	5000	4	0.09	29	1.6	Sleeve
(40 x 40 x20)		**FDC 40-12L**	12	8-18	80	1.0	5000	4	0.09	29	1.6	Sleeve
	Middle Speed	**FDC 40-05M**	5	35-65	370	1.9	7000	6	0.19	37	1.6	Sleeve
		FDC 40-12M	12	6-16	145	1.7	7000	6	0.19	37	1.6	Sleeve
		FDC 40-24M	24	8-28	95	2.3	7000	6	0.19	37	1.6	Sleeve
	High Speed	**FDC 40-05H**	5	3.5-6	600	3.0	9000	8	0.30	45	1.6	Sleeve
		FDC 40-12H	12	4-14	250	3.0	9000	8	0.30	45	1.6	Sleeve
		FDC 40-24H	24	8-28	145	3.5	9000	8	0.30	45	1.6	Sleeve
2.4 x 2.4 x 0.6	Low Speed	**FDC 60S-05L**	5	4-6	200	1.00	3000	9.5	0.071	20	3.0	Ball
(60 x 60 x 16)		**FDC 60S-12L**	12	9-18	70	0.84	3000	9.5	0.071	20	3.0	Ball
		FDC 60S-24L	24	18-30	50	1.20	3000	9.5	0.071	20	3.0	Ball
	Middle Speed	**FDC 60S-05M**	5	4-6	440	2.20	4400	14.1	0.150	31	3.0	Ball
		FDC 60S-12M	12	9-18	160	1.92	4400	14.1	0.150	31	3.0	Ball
		FDC 60S-24M	24	18-30	90	2.16	4400	14.1	0.150	31	3.0	Ball
		FDC 60S-48M	48	32-50	50	2.40	4400	14.1	0.150	31	3.0	Ball
	High Speed	**FDC60S-12H**	12	6-15	280	3.36	5500	17.7	0.217	38	3.0	Ball
		FDC60S-24H	24	12-30	140	3.36	5500	17.7	0.217	38	3.0	Ball
		FDC60S-48H	48	32-50	80	3.84	5500	17.7	0.217	38	3.0	Ball
2.4 x 2.4 x 1	Bottom Speed	**FDC60-12LL**	12	9-18	80	0.96	2500	8	0.04	20	4.6	Ball
(60 x 60 x 25)	Low Speed	**FDC60-05L**	5	4-6	220	1.10	3000	10	0.09	25	4.6	Ball
		FDC60-12L	12	9-18	95	1.14	3000	10	0.09	25	4.6	Ball
		FDC60-24L	24	18-30	55	1.32	3000	10	0.09	25	4.6	Ball
	Middle Speed	**FDC60-05M**	5	4-6	380	1.90	3800	13	0.15	33	4.6	Ball
		FDC60-12M	12	9-18	140	1.68	3800	13	0.15	33	4.6	Ball
		FDC60-24M	24	18-30	80	1.92	3800	13	0.15	33	4.6	Ball
	High Speed	**FDC60-12H**	12	6-15	180	2.16	4400	15	0.19	38	4.6	Ball
		FDC60-24H	24	12-30	100	2.40	4400	15	0.19	38	4.6	Ball
3.1 x 3.1 x 1	Low Speed	**FDC80-05L**	5	4-5.5	240	1.2	2200	20	0.087	29	5.3	Ball
(80 x 80 x 25)		**FDC80-12L**	12	8-14	100	1.2	2200	20	0.087	29	5.3	Ball
		FDC80-24L	24	16-28	60	1.44	2200	20	0.087	29	5.3	Ball
	Middle Speed	**FDC80-05M**	5	4-5.5	440	2.20	2750	26	0.138	36	5.3	Ball
		FDC80-12L	12	8-14	170	2.04	2750	26	0.138	36	5.3	Ball
		FDC80-24L	24	16-28	90	2.16	2750	26	0.138	36	5.3	Ball
	High Speed	**FDC80-12H**	12	8-14	220	2.64	3200	30	0.173	40	5.3	Ball
		FDC80-24H	24	16-28	120	2.88	3200	30	0.173	40	5.3	Ball

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HDF SERIES—ULTRA QUIET

DC BRUSHLESS MOTOR FANS

- PET plastic housing of UL94V-0 material
- PBT plastic impeller of UL94V-0 material
- Choice of two to three speeds to satisfy various applications
- Lead Wire Type (UL1007, CSA TR64, AWG24, 12 inches)
- Locked Rotor/Polarity protected

Size	Type	Model	Rated Voltage	Operating Voltage	Rated Current	Rated Input	Rated Speed	Max. Airflow	Max. Static Pressure	Noise Level	Weight	Bearing
Inch (mm)			VDC	VDC	mA	W	rpm	CFM	inchAq	dB(A) at 1m	oz	
1.2 x 1.2 x 0.8	Low Speed	**HDF 3020L-12LB**	12	10.2-13.8	54	0.64	4750	1.5	0.05	30	1.3	Ball
(30 x 30 x 20)	Middle Speed	**HDF 3020L-12MB**	12	10.2-13.8	120	1.44	6900	2.2	0.1	32	1.3	Ball
1.6 x 1.6 x 0.8	Low Speed	**HDF 4020L-12LB**	12	10.2-13.8	55	0.7	4200	4.6	0.07	26	1.1	Ball
(40 x 40 x 20)	Middle Speed	**HDF 4020L-12MB**	12	10.2-13.8	125	1.5	5900	6.4	0.14	32	1.1	Ball
2.4 x 2.4 x 1	Low Speed	**HDF 6025L-12LB**	12	10.2-13.8	50	0.60	2550	11	0.06	21	3.0	Ball
(60 x 60 x 25)	Middle Speed	**HDF 6025L-12MB**	12	10.2-13.8	70	0.84	3000	13	0.09	26	3.0	Ball
		HDF 6025L-24MB	24	20.4-27.6	45	1.08	3200	14	0.09	27	3.0	Ball
	High Speed	**HDF 6025L-12HB**	12	10.2-13.8	140	1.68	4500	19	0.19	35	3.0	Ball
		HDF 6025L-24HB	24	20.4-27.6	70	1.68	4500	19	0.19	35	3.0	Ball
3.1 x 3.1 x 1	Low Speed	**HDF 8025L-12LB**	12	10.2-13.8	65	0.78	1850	22	0.06	27	3.5	Ball
(80 x 80 x 25)	Middle Speed	**HDF 8025L-12MB**	12	10.2-13.8	105	1.26	2450	29	0.09	32	3.5	Ball
		HDF 8025L-24MB	24	20.4-27.6	60	1.44	2600	30	0.11	33	3.5	Ball
	High Speed	**HDF 8025L-12HB**	12	10.2-13.8	170	2.04	3150	37	0.16	37	3.5	Ball
		HDF 8025L-24HB	24	20.4-27.6	90	2.16	3150	37	0.16	37	3.5	Ball
3.6 x 3.6 x 1	Low Speed	**HDF 9225L-12LB**	12	10.2-13.8	120	1.44	2300	35	0.11	30	4.9	Ball
(92 x 92 x 25)		**HDF 9225L-24LB**	24	20.4-27.6	65	1.56	2300	35	0.11	30	4.9	Ball
	Middle Speed	**HDF 9225L-12MB**	12	10.2-13.8	160	1.92	2850	44	0.17	35	4.9	Ball
		HDF 9225L-24MB	24	20.4-27.6	90	2.16	2850	44	0.17	35	4.9	Ball
	High Speed	**HDF 9225L-12HB**	12	10.2-13.8	250	3.00	3300	51	0.22	40	4.9	Ball
		HDF 9225L-24HB	24	20.4-27.6	125	3.00	3300	51	0.22	40	4.9	Ball
4.7 x 4.7 x 1	Middle Speed	**HDF 1225L-12MB**	12	10.2-13.8	125	1.50	1750	58	0.08	34	6.3	Ball
(120 x 120 x 25)		**HDF 1225L-24MB**	24	20.4-27.6	70	1.68	1750	58	0.08	34	6.3	Ball
	High Speed	**HDF 1225L-12HB**	12	10.2-13.8	325	3.90	2500	83	0.17	42	6.3	Ball
		HDF 1225L-24HB	24	20.4-27.6	150	3.60	2500	83	0.17	42	6.3	Ball
	Top Speed	**HDF 1225L-12HHB**	12	10.2-13.8	780	9.36	3200	106	0.24	52	6.3	Ball
		HDF 1225L-24HHB	24	20.4-27.6	320	7.70	3200	106	0.24	52	6.3	Ball

CDF SERIES—ULTRA THIN TYPE (9MM THICK)

DC BRUSHLESS MOTOR FAN

- SPCC metal housing with MF Znl-C plating
- PET plastic impeller of UL94V-0 material
- Locked Rotor/Polarity protected

Size	Type	Model	Rated Voltage	Operating Voltage	Rated Current	Rated Input	Rated Speed	Max. Airflow	Max. Static Pressure	Noise Level	Weight	Bearing
Inch (mm)			VDC	VDC	mA	W	rpm	CFM	inchAq	dB(A) at 1m	oz	
1.6 x 1.96 x 0.35	Middle Speed	**CDF4509-12MB**	12	10.2-13.8	150	1.8	6500	3.5	0.06	35	1.4	Ball
(40 x 50 x 9)		**CDF4509-24MB**	24	20.4-27.6	80	1.9	6500	3.5	0.06	35	1.4	Ball

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DA/DB SERIES—STANDARD LOW COST TYPE

DC BRUSHLESS MOTOR FANS

- PBT plastic venturi of UL94V-0 material
- PBT plastic impeller of UL94V-0 material
- Choice of two to three speeds to satisfy various applications
- Lead Wire Type (UL1007, CSA TR64, AWG24, 12 inches)
- Economy Type
- Locked Rotor/Polarity protected

Size	Type	Model	Rated Voltage	Operating Voltage	Rated Current	Rated Input	Rated Speed	Max. Airflow	Max. Static Pressure	Noise Level	Weight	Bearing
Inch (mm)			VDC	VDC	mA	W	rpm	CFM	inchAq	dB(A) at 1m	oz	
2.4 x 2.4 x 1	Low Speed	**DA120625L**	12	10.2-13.8	0.13	1.6	3000	8	0.10	29	3.5	Sleeve
(60 x 60 x 25)		**DB240625L**	24	20.4-27.6	0.10	2.4	3000	8	0.10	29	3.5	Sleeve
	Middle Speed	**DA120625M**	12	10.2-13.8	0.15	1.8	3600	11	0.15	33	3.5	Sleeve
		DB240625M	24	20.4-27.6	0.12	2.9	3600	11	0.15	33	3.5	Sleeve
	High Speed	**DA120625H**	12	10.2-13.8	0.18	2.1	4300	15	0.23	35	3.5	Sleeve
		DB240625H	24	20.4-27.6	0.15	3.6	4300	15	0.23	35	3.5	Sleeve
3.1 x 3.1 x 1	Low Speed	**DA120825L**	12	10.2-13.8	0.13	1.6	2300	21	0.11	31	4.5	Sleeve
(80 x 80 x 25)		**DB240825L**	24	20.4-27.6	0.10	2.4	2300	21	0.11	31	4.5	Sleeve
	Middle Speed	**DA120825M**	12	10.2-13.8	0.17	2.0	2750	25	0.16	33	4.5	Sleeve
		DB240825M	24	20.4-27.6	0.11	2.6	2750	25	0.16	33	4.5	Sleeve
	High Speed	**DA120825H**	12	10.2-13.8	0.21	2.5	3100	32	0.20	37	4.5	Sleeve
		DB240825H	24	20.4-27.6	0.13	3.1	3100	32	0.20	37	4.5	Sleeve
3.1 x 3.1 x 1.3	Low Speed	**DA120832L**	12	10.2-13.8	0.15	1.8	2300	24	0.12	33	5.5	Sleeve
(80 x 80 x 32)		**DB240832L**	24	20.4-27.6	0.14	3.3	2300	24	0.12	33	5.5	Sleeve
	Middle Speed	**DA120832M**	12	10.2-13.8	0.17	2.0	2750	29	0.17	34	5.5	Sleeve
		DB240832M	24	20.4-27.6	0.16	3.8	2750	29	0.17	34	5.5	Sleeve
	High Speed	**DA120832H**	12	10.2-13.8	0.19	2.3	3100	35	0.21	38	5.5	Sleeve
		DB240832H	24	20.4-27.6	0.18	4.3	3100	35	0.21	38	5.5	Sleeve
3.6 x 3.6 x 1	Low Speed	**DA120925L**	12	10.2-13.8	0.17	2.0	2300	23	0.10	32	4.5	Sleeve
(92 x 92 x 25)		**DB240925L**	24	20.4-27.6	0.11	2.6	2300	23	0.10	32	4.5	Sleeve
	Middle Speed	**DA120925M**	12	10.2-13.8	0.21	2.5	2750	30	0.16	37	4.5	Sleeve
		DB240925M	24	20.4-27.6	0.14	3.3	2750	30	0.16	37	4.5	Sleeve
	High Speed	**DA120925H**	12	10.2-13.8	0.27	3.2	3000	39	0.23	39	4.5	Sleeve
		DB240925H	24	20.4-27.6	0.19	4.6	3000	39	0.23	39	4.5	Sleeve
4.7 x 4.7 x 1	Low Speed	**DA121225L**	12	10.2-13.8	0.28	3.4	2400	55	0.19	38	7.7	Sleeve
(120 x 120 x 25)		**DB241225L**	24	20.4-27.6	0.18	4.3	2400	55	0.19	38	7.7	Sleeve
	Middle Speed	**DA121225M**	12	10.2-13.8	0.34	4.1	2750	65	0.24	41	7.7	Sleeve
		DB241225M	24	20.4-27.6	0.23	5.5	2750	65	0.24	41	7.7	Sleeve
	High Speed	**DA121225H**	12	10.2-13.8	0.45	5.4	3100	80	0.30	45	7.7	Sleeve
		DB241225H	24	20.4-27.6	0.30	7.2	3100	80	0.30	45	7.7	Sleeve
4.7 x 4.7 x 1.5	Low Speed	**DA121238L**	12	10.2-13.8	0.28	3.4	2300	60	0.21	38	10.9	Sleeve
(120 x 120 x 38)		**DB241238L**	24	20.4-27.6	0.25	6.0	2300	60	0.21	38	10.9	Sleeve
	Middle Speed	**DA121238M**	12	10.2-13.8	0.45	5.4	2700	75	0.27	41	10.9	Sleeve
		DB241238M	24	20.4-27.6	0.28	6.7	2700	75	0.27	41	10.9	Sleeve
	High Speed	**DA121238H**	12	10.2-13.8	0.55	6.6	3000	105	0.34	48	10.9	Sleeve
		DB241238H	24	20.4-27.6	0.35	8.4	3000	105	0.34	48	10.9	Sleeve

*Materials: DA/DB series: Thermoplastic PBT of UL 94-VO — Available for all sizes.
DAP/DBP series: Thermoplastic ABS of UL 94-HB — 92 x 92, 80 x 80, and 60 x 60 size only. (low cost type)

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EP SERIES

SHADED POLE MOTOR FANS

- Durable die cast aluminum venturi
- Polycarbonate impeller of UL94V-0 material
- Choice of two to three speeds to satisfy various applications
- UL recognized/CSA certified
- Locked Rotor/Impedance protected
- Economy Type

Size	Type	Model	Rated Voltage	Frequency	Current Rated	Locked Rotor	Rated Input	Rated Speed	Max. Airflow	Max. Static Pressure	Noise Level	Weight	Bearing
Inch (mm)			VAC	Hz	mA	mA	W	rpm	CFM	inchAq	dB(A) at 1m	oz	
3.1 x 3.1 x 1	High Speed	**EP082515-HSL**	115	60	0.11	130	10	2800	21	0.15	33	8.7	Sleeve
(80 x 80 x 25)	Low Speed	**EP082515-LSL**	115	60	0.10	120	8	2300	15	0.12	29	8.7	Sleeve
	High Speed	**EP082530-HSL**	230	60	0.06	90	11	2800	21	0.15	33	8.7	Sleeve
	Low Speed	**EP082530-LSL**	230	60	0.05	70	8	2300	15	0.12	29	8.7	Sleeve
3.1 x 3.1 x 1.5	High Speed	**EP083815-HSL**	115	60	0.12	140	11	2800	30	0.17	35	12.5	Sleeve
(80 x 80 x 38)	Low Speed	**EP083815-LSL**	115	60	0.11	120	8	2500	23	0.14	32	12.5	Sleeve
	High Speed	**EP083830-HSL**	230	60	0.07	100	12	2800	30	0.17	35	12.5	Sleeve
	Low Speed	**EP083830-LSL**	230	60	0.06	80	9	2500	23	0.14	32	12.5	Sleeve
3.6 x 3.6 x 1	High Speed	**EP092515-HST**	115	60	0.11	130	11	2700	36	0.15	39	9.6	Sleeve
(92 x 92 x 25)	Low Speed	**EP092515-LST**	115	60	0.09	110	8	2200	26	0.12	35	9.6	Sleeve
	High Speed	**EP092530-HST**	230	60	0.06	90	12	2700	36	0.15	39	9.6	Sleeve
	Low Speed	**EP092530-LST**	230	60	0.05	70	9	2700	26	0.12	35	9.6	Sleeve
4.7 x 4.7 x 1.5	High Speed	**EP123815H-HST**	115	60	0.18	210	18	3000	105	0.32	49	17.7	Sleeve
(120 x 120 x 38)	Middle Speed	**EP123815M-MST**	115	60	0.14	160	16	2500	75	0.22	42	17.7	Sleeve
	Low Speed	**EP123815L-LST**	115	60	0.12	110	13	2150	60	0.16	38	17.7	Sleeve
	High Speed	**EP123830H-HST**	230	60	0.11	120	19	3000	105	0.32	49	17.7	Sleeve
	Middle Speed	**EP123830M-MST**	230	60	0.08	100	15	2500	75	0.22	42	17.7	Sleeve
	Low Speed	**EP123830L-LST**	230	60	0.06	80	12	2150	60	0.16	38	17.7	Sleeve

※ Ball bearing types are available upon request

AF SERIES

SHADED POLE MOTOR FANS

- Durable die cast aluminum venturi
- PBT plastic impeller of UL94V-0 material
- Choice of two to three speeds to satisfy various applications
- UL recognized/CSA certified (AS Type ---- UL recognition only)
- Locked Rotor/Impedance protected

Size	Type	Model	Rated Voltage	Frequency	Current Rated	Locked Rotor	Rated Input	Rated Speed	Max. Airflow	Max. Static Pressure	Noise Level	Weight	Bearing
Inch (mm)			VAC	Hz	mA	mA	W	rpm	CFM	inchAq	dB(A) at 1m	oz	
3.1 x 3.1 x 1	Low Speed	**AF8025L-115L**	115	60	52	54	4.5	2000	15	0.094	32	8.5	Ball
(80 x 80 x 25)		**AF8025L-230L**	230	60	26	27	4.5	2000	15	0.094	32	8.5	Ball
	High Speed	**AF8025L-115H**	115	60	74	93	6	3000	24	0.213	36	8.5	Ball
		AF8025L-230H	230	60	37	46	6	3000	24	0.213	36	8.5	Ball
3.6 x 3.6 x 1	Low Speed	**AF9225T-115L**	115	60	73	76	6	2000	28	0.106	34	9.9	Ball
(92 x 92 x 25)		**AF9225T-230L**	230	60	37	38	6	2000	28	0.106	34	9.9	Ball
	High Speed	**AF9225T-115H**	115	60	107	133	9	3000	42	0.252	39	9.9	Ball
		AF9225T-230H	230	60	54	66	9	3000	42	0.252	39	9.9	Ball
4.7 x 4.7 x 1	Low Speed	**AF1225T-115L**	115	60	98	102	8	1800	53	0.091	36	11.6	Ball
(120 x 120 x 25)		**AF1225T-230L**	230	60	49	51	8	1800	53	0.091	36	11.6	Ball
	High Speed	**AF1225T-115H**	115	60	134	168	12	2750	81	0.177	45	11.6	Ball
		AF1225T-230H	230	60	67	84	12	2750	81	0.177	45	11.6	Ball
4.7 x 4.7 x 1.5	Low Speed	**AF1238T-115L**	115	60	150	166	12	2000	71	0.157	38	19.4	Ball
(120 x 120 x 38)		**AF1238T-230L**	230	60	75	83	12	2000	71	0.157	38	19.4	Ball
	Middle Speed	**AF1238T-115M**	115	60	178	204	14	2350	85	0.197	42	19.4	Ball
		AF1238T-230M	230	60	89	102	14	2350	85	0.197	42	19.4	Ball
	High Speed	**AF1238T-115H**	115	60	194	274	15	3000	106	0.354	49	19.4	Ball
		AF1238T-230H	230	60	97	137	15	3000	106	0.354	49	19.4	Ball
5.9" x 1.5	Low Speed	**AS1538L-115LM**	115	60	358	395	27	2350	141	0.244	54	29.3	Ball
(150" x 3.8)		**AS1538L-230LM**	230	60	179	198	27	2350	141	0.244	54	29.3	Ball
	Middle Speed	**AS1538L-115MM**	115	60	383	526	30	2950	177	0.433	60	29.3	Ball
		AS1538L-230MM	230	60	192	263	30	2950	177	0.433	60	29.3	Ball
	High Speed	**AS1538L-115HM**	115	60	399	552	33	2950	205	0.354	61	29.3	Ball
		AS1538L-230HM	230	60	200	276	33	2950	205	0.354	61	29.3	Ball
5.9" x 2.2	Low Speed	**AS1555L-115LM**	115	60	355	452	34	2750	177	0.354	55	42.3	Ball
(150" x 2.2)		**AS1555L-230LM**	230	60	177	226	34	2750	177	0.354	55	42.3	Ball
	Middle Speed	**AS1555L-115MM**	115	60	388	627	34	3050	205	0.512	59	42.3	Ball
		AS1555L-230MM	230	60	194	314	34	3050	205	0.512	59	42.3	Ball
	High Speed	**AS1555L-115HM**	115	60	498	770	38	3050	238	0.433	63	42.3	Ball
		AS1555L-230HM	230	60	249	385	38	3050	238	0.433	63	42.3	Ball

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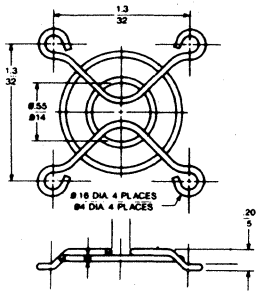
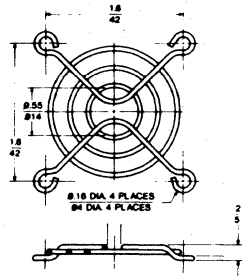
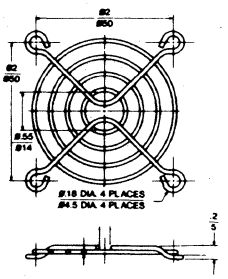
0015 (For 1½" sq.)



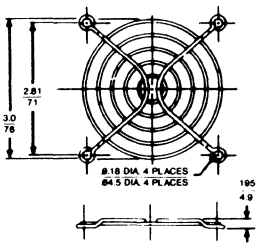
0020 (For 2" sq.)



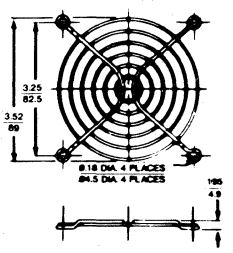
0024 (For 2⅜" sq.)



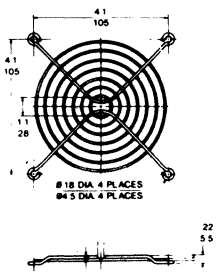
0031 (For 3⅛" sq.)



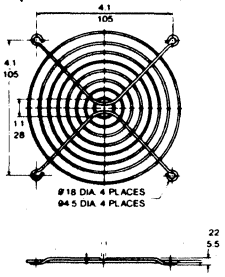
0036 (For 3⅝" sq.)



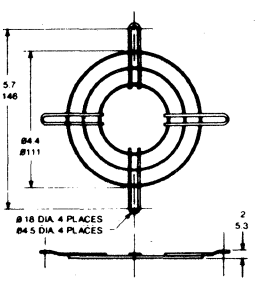
00457 (For 4½" sq.)



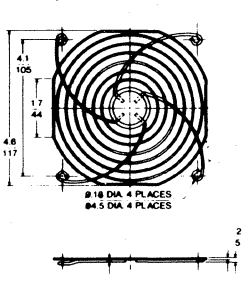
00458 (For 4½" sq.)



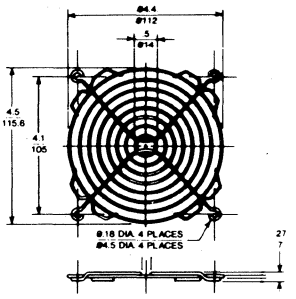
0045C (For 4½" sq.)



0045D (For 4½" sq.)

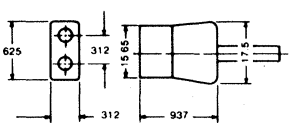


0045E (For 4½" sq.)



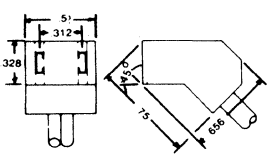
FAN CORDS DIMENSIONS STATED IN INCHES

CD180 - STRAIGHT TYPE



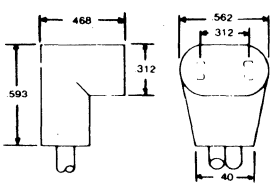
PART NO.	DESCRIPTION
CD180-12	Straight 12" cord
CD180-24	Straight 24" cord
CD180-36	Straight 36" cord

CD045 - 45° TYPE



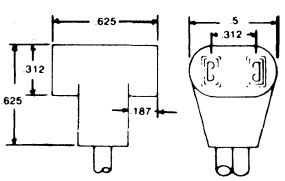
PART NO.	DESCRIPTION
CD045-12	45° 12" cord
CD045-24	45° 24" cord
CD045-36	45° 36" cord

CD090 - 90° TYPE



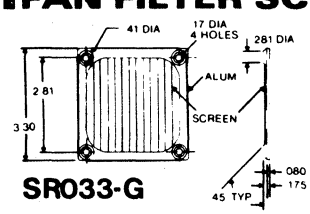
PART NO.	DESCRIPTION
CD090-12	90° 12" cord
CD090-24	90° 24" cord
CD090-36	90° 36" cord

CD090 - T TYPE

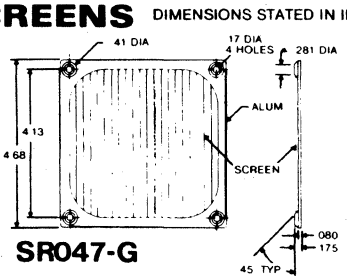


PART NO.	DESCRIPTION
CD090T-12	T 12" cord
CD090T-24	T 24" cord
CD090T-36	T 36" cord

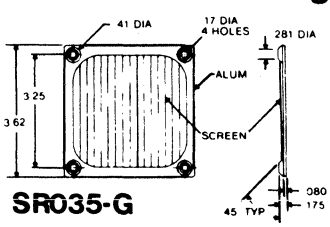
FAN FILTER SCREENS DIMENSIONS STATED IN INCHES



SR033-G



SR047-G

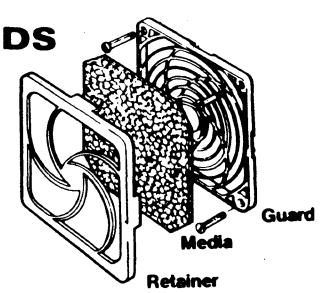


SR035-G

SPECIFICATIONS

- Fan Size: Fits any standard 3-1/8", 3-5/8" and 4-1/2" tube axial fans.
- Finish: Irridite (Gold)
- Frame Material: Aluminum
- Screen Material: 30 x 30 aluminum mesh convoluted approx. 1/8" deep with approx. 3/16" pitch
- Tolerance: xx = ± .03 xxx = ± .015

FAN GUARDS & FILTERS



FAN SIZE	PART NO.	DESCRIPTION	H (in.)	W (in.)	T (in.)	M/C (in.)
3⅛"	03145	Guard, Media Retainer	3.25	3.25	0.40	2.81
3⅝"	03645	Guard, Media Retainer	3.73	3.73	0.40	3.21
4½"	04545	Guard, Media Retainer	4.78	4.78	0.42	4.13

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- Unimax

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- Curtis
- Electrovert
- Magnum
- RDI
- Siemen
- USD
- Vernitron-Beau
- Weidmuller

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- Simpson Electric
- Triplett

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- Amperite
- Industrial Timer
- Magnecraft
- Master Electronics
- Midtex
- Omron
- Potter & Brumfield
- SSAC

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- Weller
- Xcelite
- Helper Winch

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- Jeffersons
- Microtran
- Sola
- Stancor
- Thordarson
- Triad
- U.T.C.

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- Eimac
- G.E.
- National
- Raytheon
- R.C.A.
- Varian (Klystrons)

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- Electrovert
- Heli-Tube
- Panduit

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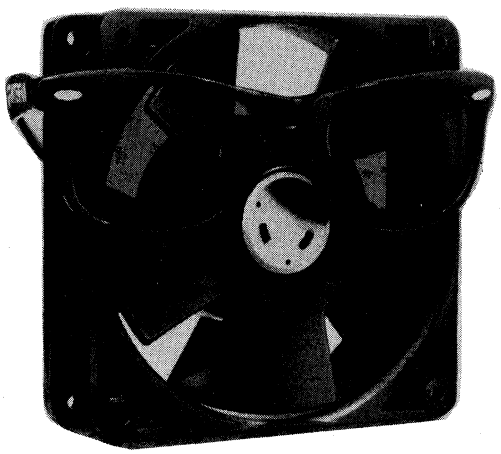

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DC FANS

SPECIFICATIONS

Model	Voltage VDC Nom	Airflow (0 static pressure) cfm Nom.	Input Current mA Nom.	Input Power Watts Nom.	Speed rpm Nom.	Noise Level dB (A) Nom.	Weight ozs.	Frame Size H X W X D Inches (mm)	Construction
PO003-12D-1B	12	3.5	100	1.2	5800	30	0.7	1 1/2 × 1 1/2 × 3/8 (40 × 40 × 10)	Plastic housing and impeller, precision ball bearing. Wire leads: 26 AWG, 6.00 ± .5 in. long.
PO005-12D-1B	12	5.5	150	1.8	6000	35	1.5	1 1/2 × 1 1/2 × 3/4 (40 × 40 × 20)	Plastic housing and impeller, precision ball bearing. Wire leads: 26 AWG, 14.00 ± .5 in. long.
PO005-24D-1B	24		100	2.4					
PO012-12D-2B	12	12	85	1.1	3200	36	3.5	2 1/2 × 2 1/2 × 1 (60 × 60 × 25)	Polycarbonate housing and impeller, precision ball bearings. Wire leads: 24 AWG, 12.25 ± .5 in. long.
PO012-24D-2B	24			1.9	3350				
PO014-12D-2B	12	14	200	2.4	3700	30	1.5	2 1/2 × 2 1/2 × 1/2 (62 × 62 × 15)	Plastic housing and impeller, precision ball bearing. Wire leads: 26 AWG, 13.00 ± .5 in. long.
PO014-24D-2B	24		100						
PO020-12D-3B	12	20	90	1.1	2150	33	5.3	3 1/8 × 3 1/8 × 1 1/4 (80 × 80 × 32)	Polycarbonate housing and impeller, precision ball bearings. Wire leads: 24 AWG, 14.00 ± .5 in. long.
PO020-24D-3B	24		70	2.0	2250				
PO022-12D-3B	12	22	200	2.4	3000	32	4.0	3 5/8 × 3 5/8 × 5/8 (92 × 92 × 15.5)	Plastic housing and impeller, precision ball bearings. Wire leads: 25 AWG, 13.00 ± .5 in. long.
PO022-24D-3B	24		100						
PO025-12D-3B	12	25	145	1.9	2850	35	5.3	3 1/8 × 3 1/8 × 1 (80 × 80 × 25)	Polycarbonate housing and impeller, precision ball bearings. Wire leads: 24 AWG, 14.00 ± .5 in. long.
PO025-24D-3B	24		90	2.3					

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SPECIFICATIONS

DC FANS

Model	Voltage VDC Nom	Airflow (0 static pressure) cfm Nom.	Input Current mA Nom.	Input Power Watts Nom.	Speed rpm Nom.	Noise Level dB (A) Nom.	Weight ozs.	Frame Size H X W X D Inches (mm)	Construction
PO034-12D-3B	12	34	130	1.6	3000	33	5.0	$3^5/_8 \times 3^5/_8 \times 1$ (92 × 92 × 25)	Plastic housing and impeller, precision ball bearings. Wire leads: 22 AWG, 10.50 ± .5 in. long.
PO034-24D-3B	24		60	1.4					
PO035-12D-3B	12	35	275	3.5	3200	39	5.3	$3^1/_8 \times 3^1/_8 \times 1^1/_4$ (80 × 80 × 32)	Polycarbonate housing and impeller, precision ball bearings. Wire leads: 24 AWG, 14.00 ± .5 in. long.
PO035-24D-3B	24		130	3.3					
PO040-12D-3B	12	40	180	2.2	3200	38	5.3	$3^5/_8 \times 3^5/_8 \times 1$ (92 × 92 × 25)	Polycarbonate housing and impeller, precision ball bearings. Wire leads: 24 AWG, 14.00 ± .5 in. long.
PO040-24D-3B	24		115	2.9	3350				
PO053-12D-3B	12	53	245	2.9	3050	37	5.3	$3^5/_8 \times 3^5/_8 \times 1^1/_4$ (92 × 92 × 32)	Plastic housing and impeller, precision ball bearings. Wire leads: 24 AWG, 12.00 ± .5 in. long.
PO053-24D-3B	24		140	3.4	3150				
PM082-12D-4B	12	82	560	6.7	3200	45	9.0	$4^{11}/_{16} \times 4^{11}/_{16} \times 1$ (119.5 × 119.5 × 25)	Die cast aluminum housing, polycarbonate impeller, precision ball bearings. Wire leads: 24 AWG, 13.25 ± .5 in. long.
PM082-24D-4B	24		300	7.5	3250				
PM106-12D-4B	12	106	690	8.5	3150	47	13.0	$4^{11}/_{16} \times 4^{11}/_{16} \times 1^1/_2$ (119.5 × 119.5 × 38)	Die cast aluminum housing, polycarbonate impeller, precision ball bearings. Wire leads: 24 AWG, 13.25 ± .5 in. long.
PM106-24D-4B	24		360	8.6	3100				
PM106-12D-4BT	12	106	690	8.5	3150	47	13.0	$4^{11}/_{16} \times 4^{11}/_{16} \times 1^1/_2$ (119.5 × 119.5 × 38)	Die cast aluminum housing, polycarbonate impeller, precision ball bearings. Terminal block.
PM106-24D-4BT	24		360	8.6	3100				
PM106-48D-4BT	48		190	9.0	3100				

AC FANS AND BLOWERS

Model	Voltage VAC	Airflow cfm	Input Power Watts	Speed rpm	Noise Level dB (A)	Life Expectancy Hours at °C	Weight ozs.	Frame Size H × W × D Inches (mm)	Construction
PM018-115-3B	115	18	8.5	2600	33	20K at 70	7	$3^1/_8 \times 3^1/_8 \times {}^3/_4$ (80 × 80 × 20)	Die cast aluminum housing, plastic impeller, precision ball bearings. Wire leads: 22 AWG, 14.00 ± .5 in. long
PM024-115-3B	115	24	7	3050	36	20K at 70	8	$3^1/_8 \times 3^1/_8 \times 1$ (80 × 80 × 25)	
PM024-230-3B	230			3100					
MM032-115-3B	115	32	10	3300	40	20K at 70	16	$3^1/_8 \times 3^1/_8 \times 1^1/_2$ (80 × 80 × 38)	All metal, shaded pole motor, precision ball bearings. Wire leads: 24 AWG, 13.25 ± .5 in. long.
MM032-115-3B-5	115		10						
MM032-230-3B	230		12						
PM032-115-3B	115	32	8	3200	36	20K at 70	9	$3^1/_8 \times 3^1/_8 \times 1^1/_2$ (80 × 80 × 38)	Die cast aluminum housing, plastic impeller, precision ball bearings. Terminal block.
PM032-230-3B	230		9						
PM040-115-3B	115	40	9.5	3100	36	20K at 70	10	$3^5/_8 \times 3^5/_8 \times 1$ (92 × 92 × 25)	
PM040-230-3B	230		11						
PM058-115-4B	115	58	11	2350	39	20K at 70	10	$4^{11}/_{16} \times 4^{11}/_{16} \times {}^3/_4$ (119.5 × 119.5 × 20.3)	Die cast aluminum housing, plastic impeller, precision ball bearings. Wire leads: 22 AWG, 13.25 ± .5 in. long.
PM058-230-4B	230		14.5	2500					
MM060-115-4B	115	60	9	2100	38	20K at 70	19	$4^{11}/_{16} \times 4^{11}/_{16} \times 1^1/_2$ (119.5 × 119.5 × 38)	All metal, shaded pole motor, precision ball bearings. Terminal block.
MM060-230-4B	230								
PM074-115-4B	115	74	11.5	2900	43	20K at 70	15	$4^{11}/_{16} \times 4^{11}/_{16} \times 1$ (119.5 × 119.5 × 25)	Die cast aluminum housing, plastic impeller, precision ball bearings. Terminal block.
PM074-230-4B	230		12						
MM106-115-4B	115	106	18	3200	44	20K at 70	21	$4^{11}/_{16} \times 4^{11}/_{16} \times 1^1/_2$ (119.5 × 119.5 × 38)	All metal, shaded pole motor, precision ball bearings. Terminal block.
MM106-115-4B-5	115								
MM106-230-4B	230								
PM106-115-4B	115	106	14	3200	46	20K at 70	20	$4^{11}/_{16} \times 4^{11}/_{16} \times 1^1/_2$ (119.5 × 119.5 × 38)	Die cast aluminum housing, plastic impeller, precision ball bearings. Terminal block.
PM106-230-4B	230		15						
MM235-115-6B	115	235	38	3350	53	20K at 70	43	$6^3/_4$ dia × 2 (172 dia × 55)	All metal, shaded pole motor, precision ball bearings. Wire leads: 20 AWG, 13.25 ± .5 in. long.
MM235-230-6B	230		37.5						
PMB24-115-4B	115	24	20	2300	53	20K at 70	23	$4^3/_4 \times 4^3/_4 \times 1^1/_2$ (120.5 × 120.5 × 38)	Polycarbonate housing, plastic wheel, shaded pole motor, precision ball bearings. Wire leads: 20 AWG, 12.00 ± .5 in. long.
PMB24-230-4B	230								

Notes:
All Fans and Blowers are 50/60 Hz. Specifications are at 60 Hz.
Fan Models MM032-115-3B-5 and MM106-115-4B-5 have five year warranties.

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Thermoelectric Innovation Through Research

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THERMOELECTRIC COOLERS

WHAT IS A THERMOELECTRIC COOLER?

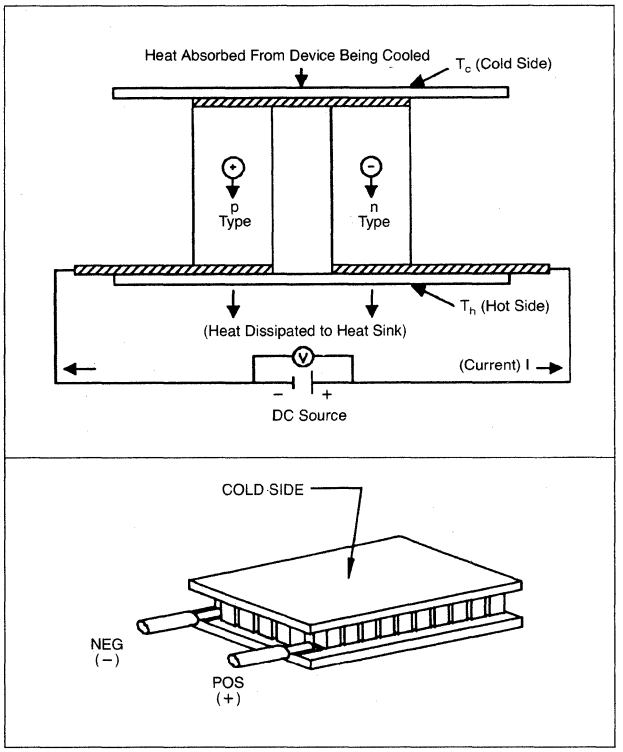
Thermoelectric coolers (TECs) are solid-state, vibration-free, noise-free heat pumps. They are modular devices and are simple to install and operate. Since they consist primarily of thermoelectric material sandwiched between ceramic plates with no moving parts, they are inherently reliable.

A single-stage thermoelectric cooler is composed of a matrix of thermoelectric couples, connected electrically in series and thermally in parallel. The thermoelectric couple consists of a p- and n-type semiconductor material.

A TEC can be fabricated with as few as one couple to as many as several hundred couples sandwiched between two ceramic plates. These plates form the top and base of the cooler and provide structural integrity as well as electrical insulation from, and thermal conduction to, the heat sink and the device being cooled.

HOW IT WORKS

Regulating the direction and amount of current—with the use of a feedback loop and temperature controller—allows TECs to cool, heat, or stabilize temperature. Reversing the direction of the current reverses the direction of heat pumping. The figure opposite illustrates the operation of a thermoelectric couple in the cooling mode.



TYPICAL APPLICATIONS

Thermoelectric coolers are ideally suited to a wide variety of applications due to their small size, wide operating temperature range, low power requirements, and high reliability. Applications can be found in military, aerospace, and commercial products, laboratory and scientific equipment, medical instruments, and test equipment.

Electro-optic cooling applications include stabilizing the temperature of solid-state lasers, and cooling infrared detectors and charge coupled devices (CCDs).

Volume cooling includes small volumes of air or liquid, and cold plates.

Miscellaneous Electronic Components such as high speed integrated circuits, parametric amplifiers, avalanche photo diodes, and vidicon tubes can be spot cooled using thermoelectric coolers.

STANDARD THERMOELECTRIC COOLERS

Model Number	ΔTmax°C vacuum	ΔTmax °C dry Ng	Qmax (watts)	Imax (amps)	Vmax (volts)	Base Ceramic Width in. (mm)	Base Ceramic Length in. (mm)	Top Ceramic Width in. (mm)	Top Ceramic Length in. (mm)	Cooler Ht. in. (mm)	Ht. Tolerance ±in. (±mm)
MI1010T	67	61	0.47	1.0	0.8	0.156 (4.0)	0.156 (4.0)	0.156 (4.0)	0.156 (4.0)	0.095 (2.4)	0.005 (0.1)
MI1020T	67	64	0.90	1.8	0.8	0.156 (4.0)	0.156 (4.0)	0.156 (4.0)	0.156 (4.0)	0.085 (2.2)	0.005 (0.1)
MI1011T	67	61	1.0	1.0	2.0	0.260 (6.6)	0.260 (6.6)	0.260 (6.6)	0.260 (6.6)	0.095 (2.4)	0.005 (0.1)
MI1012T	67	61	2.1	1.0	3.7	0.346 (8.8)	0.346 (8.8)	0.346 (8.8)	0.346 (8.8)	0.095 (2.4)	0.005 (0.1)
MI1021T	67	64	2.2	1.8	1.9	0.260 (6.6)	0.260 (6.6)	0.260 (6.6)	0.260 (6.6)	0.085 (2.2)	0.005 (0.1)
MI1015T	67	61	2.6	1.0	4.6	0.346 (8.8)	0.432 (11.0)	0.346 (8.8)	0.432 (11.0)	0.094 (2.4)	0.005 (0.1)
MI1022T	67	64	4.0	1.8	3.5	0.346 (8.8)	0.346 (8.8)	0.346 (8.8)	0.346 (8.8)	0.085 (2.2)	0.005 (0.1)
MI1013T	67	61	4.8	1.0	8.5	0.518 (13.2)	0.518 (13.2)	0.518 (13.2)	0.518 (13.2)	0.095 (2.4)	0.005 (0.1)
MI1025T	67	64	5.0	1.8	4.4	0.346 (8.8)	0.432 (11.0)	0.346 (8.8)	0.432 (11.0)	0.084 (2.1)	0.005 (0.1)
MI1061T	67	64	6.4	5.3	1.9	0.511 (13.0)	0.590 (15.0)	0.511 (13.0)	0.511 (13.0)	0.140 (3.6)	0.005 (0.1)
MI1023T*	67	64	9.2	1.8	8.0	0.518 (13.2)	0.518 (13.2)	0.518 (13.2)	0.518 (13.2)	0.085 (2.2)	0.005 (0.1)
MI1120*	67	64	25.0	11.2	3.5	1.167 (29.6)	1.167 (29.6)	1.167 (29.6)	1.167 (29.6)	0.195 (4.9)	0.010 (0.3)
MI1063T*	67	64	27.0	5.3	8.1	1.170 (29.7)	1.320 (33.5)	1.170 (29.7)	1.170 (29.7)	0.140 (3.6)	0.005 (0.1)
MI2021T	91	83	0.92	1.4	2.0	0.260 (6.6)	0.260 (6.6)	0.156 (4.0)	0.156 (4.0)	0.149 (3.8)	0.007 (0.2)
MI2060	96	83	1.1	5.5	0.8	0.380 (9.7)	0.380 (9.7)	0.205 (5.2)	0.205 (5.2)	0.294 (7.5)	0.013 (0.3)
MI2012	86	77	2.4	1.2	5.4	0.432 (11.0)	0.389 (9.9)	0.346 (8.8)	0.260 (6.6)	0.147 (3.7)	0.007 (0.2)
MI2064	99	92	9.6	5.6	8.2	1.167 (29.6)	1.167 (29.6)	0.511 (13.0)	0.511 (13.0)	0.293 (7.4)	0.015 (0.4)
MI2063	91	83	14.0	5.0	8.4	1.167 (29.6)	1.167 (29.6)	0.770 (19.6)	0.770 (19.6)	0.293 (7.4)	0.015 (0.4)
MI3021T	110	96	0.33	1.3	1.9	0.260 (6.6)	0.260 (6.6)	0.100 (2.5)	0.100 (2.5)	0.212 (5.4)	0.010 (0.3)
MI3026T	109	93	0.62	1.3	3.4	0.346 (8.8)	0.346 (8.8)	0.160 (4.1)	0.174 (4.4)	0.234 (5.9)	0.010 (0.3)
MI3040	109	98	5.6	4.5	7.3	0.855 (21.7)	1.113 (28.3)	0.339 (8.6)	0.511 (13.0)	0.430 (10.9)	0.015 (0.4)
MI4000T	110	—	0.43	0.6	7.0	0.520 (13.2)	0.678 (17.2)	0.160 (4.1)	0.314 (8.0)	0.345 (8.8)	0.013 (0.3)
MI4012T	114	—	0.76	1.0	6.7	0.520 (13.2)	0.678 (17.2)	0.160 (4.1)	0.314 (8.0)	0.345 (8.8)	0.013 (0.3)
MI4040	120	—	2.7	4.0	6.8	0.855 (21.7)	1.113 (28.2)	0.253 (6.4)	0.425 (10.8)	0.561 (14.3)	0.020 (0.5)
MI6030	133	—	0.58	3.6	6.3	0.855 (21.7)	1.113 (28.3)	0.205 (5.2)	0.205 (5.2)	0.809 (20.5)	0.020 (0.5)

*Available lapped to ±.001 inch, height tolerance will change on lapped models, consult factory.

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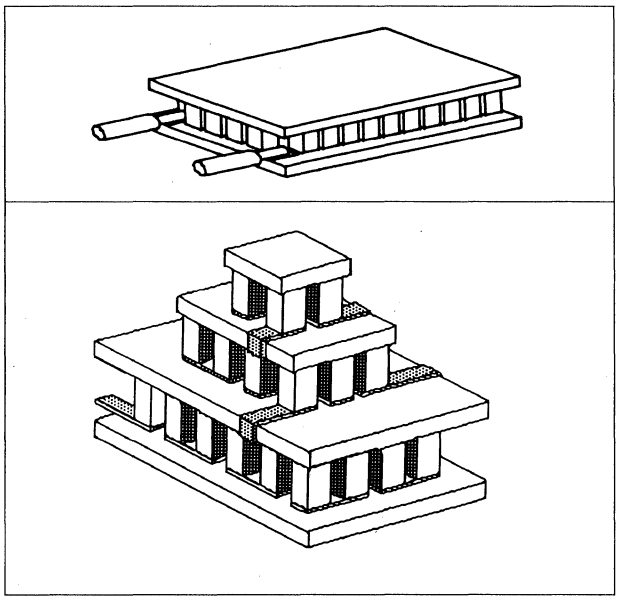
10451 VISTA PARK ROAD, DALLAS, TEXAS 75238-1645 / TEL: 214-340-4900 / FAX: 214-341-5212

ADVANTAGES OF USING THERMOELECTRIC COOLING

- ☐ Localized Cooling
- ☐ Solid State Reliability
- ☐ Temperature Control Above or Below Ambient
- ☐ DC Powered
- ☐ No Gases or Refrigerant Required
- ☐ Small, Lightweight Package
- ☐ Operation in Any Orientation
- ☐ High Resistance to Shock and Vibration
- ☐ Operation in Zero Gravity
- ☐ No Moving Parts
- ☐ Operation in High-G Levels
- ☐ No Acoustical Noise
- ☐ Heating or Cooling—Depending on Current Direction
- ☐ No Electrical Noise
- ☐ Precision Temperature Control to less than .05°C
- ☐ Maintenance Free



HOW TO SPECIFY THERMOELECTRIC COOLERS

The standard coolers on the following page are a representative sample of our product line and are grouped according to the number of stages indicated by the first digit following the "M." They are listed in increasing order according to "Qmax"; the net heat load to completely suppress ΔT at the maximum applied power (Imax @ Vmax). For example, the MI3026T is a three-stage cooler which produces 109°C ΔT in a vacuum at 1.3 amps @ 3.4 volts. It will take .62 watts to completely suppress that ΔT to zero. This suppression is linear so that 10% of Qmax (0.072 watts) applied to the cold plate would suppress ΔT 10% thereby producing 98.1°C ΔT for that heat load condition.

Because of the non-linear behavior of TECs and the number of variables involved in analyzing them, they can be designed and modeled more accurately by our experienced engineers using Marlow Industries' proprietary computer software. For selection of coolers with more than two stages, or if more precision is required, please consult one of our application engineers.

ASSEMBLIES AND RELATED PRODUCTS

COLD PLATES

Liquid Cooled. ST2018. ΔTmax = 49°C; Vmax = 12.4 volts; Imax = 9.5 amps; Qmax = 70 watts; 3.5″ × 4.25″ (89 × 109) Cold Plate

Fan Cooled. ST2033. ΔTmax = 38°C; Vmax = 12.5 volts; Imax = 8.5 amps; Qmax = 60 watts; 3.25″ × 3.25″ (83 × 83) Cold Plate

VACUUM ENCLOSURE. ST1018. 3.6″ (91) ID; 1.5″ (38) dia. Quartz window; O-Ring seal; 42 Feed-throughs

POWER SUPPLY/CONTROLLERS

Cool-Only, Low Capacity. SE1032. Output: 4.0 volts @ .14 amps to 3.5 volts @ 2 amps (Adjustable from 0 watts) Bench Model

Cool/Heat, Med. Capacity. SE1012. Output: 11.7 volts @ 1 amp to 7.2 volts @ 6 amps (Adjustable from 0 watts) Bench/Rack Model

HEAT SINKS

Fan Cooled. ST2032. Fan power required: 115 VAC, 60HZ; Heat sink resistance = 0.15°C/watt

Liquid Cooled. ST1050. Water inlet required; Heat sink resistance = 0.05°C/watt @ 0.4 Gal/min.

TEC ORDERING INFORMATION

To place an order, please direct your call to our Customer Service department at 214-340-4900, or send a FAX to 214-341-5212. When ordering from anywhere outside the U.S., our European and Far East representatives can be obtained from Customer Service.

HOW TO ORDER THERMOELECTRIC COOLERS

After you have chosen the thermoelectric cooler which meets your performance requirements, the complete part number should be specified, such as MI1022T-02AC. The two digits after the dash (-) specify metallized exterior which can be used to mount the cooler using solder or epoxy.

-01 means both sides are metallized
-02 means hot side only metallized
-03 means no metallization

The two letters refer to the ceramic material.

AC means aluminum oxide ceramic
BC means beryllium oxide ceramic

Most one- and two-stage coolers perform well with aluminum oxide (AC) ceramics. Beryllium oxide (BC) ceramics are used for coolers with three or more stages. BC ceramics can be used in one- and two-stage coolers at an additional cost.

SPECIAL OPTIONS

- Standard, no options.
- Pretinned hot side ceramic with 117°C solder.
- Pretinned hot and cold side ceramics with 117°C solder.
- Pretinned hot side ceramic with 96°C solder.
- Pretinned hot and cold side ceramics with 96°C solder.
- Thermistor (P/N 2228-07) mounted on edge of cold ceramic.
- Thermistor (P/N 2228-07) calibrated and mounted on edge of cold ceramic.
- Lapped to ±.001 inch (.025 mm), not available on all models (see table of Standard Thermoelectric Coolers on pages 8 and 9 for availability).
- Telecom grade, pre-screening for extended life (lot test data provided).

Unlimited Cooling Solutions!

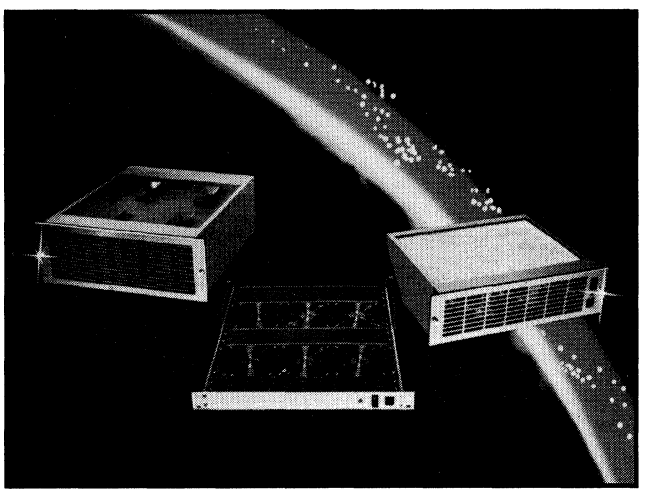
Standard, Modified, and Custom Cooling Capabilities From the Industry's Pioneer...

McLEAN CARD COOLERS

—Single and Variable Speed Cooling for VME Multi-Bus II Card Cages

- **Cooling on Demand**
- **Performance Monitoring**
- **150 to 1300 CFM, 0-1.4" Static Pressure**

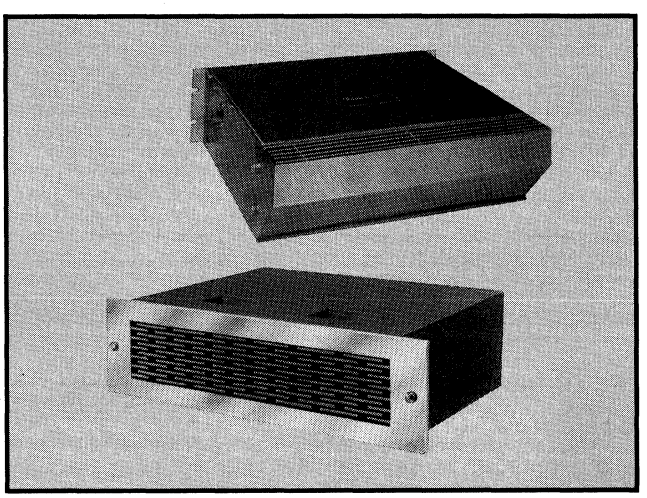
McLean's new "smart" CARD COOLERS combine maximum efficiency with maximum reliability, resulting in reduced downtime for your entire system. The CARD COOLERS' ability to sense heat levels and match motor speeds to cooling requirements means ultra quiet operation with lower power usage and less wear and tear on the system components. Available in fan tray, packaged fan and packaged blower versions, single or variable speeds.



McLEAN PACKAGED BLOWERS

- **Broad Range of Models**
- **Designed-In Dependability**
- **60-2,500 CFM, 0.0" to 9.0" Static Pressure**
- **115-230VAC, 12, 24, 48VDC**

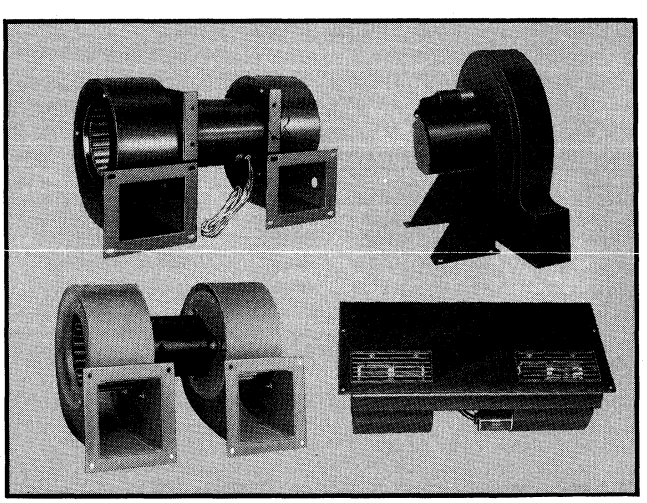
McLean was the pioneer in developing compact, high performance forced-air cooling units designed to protect heat-sensitive rack-mounted electronics. We're still the leaders, and can offer a wide range of configurations, CFMs, static pressures, shielding, and more. And, our vertically-integrated manufacturing processes mean that you can off-load much of your subassembly work to McLean for lower cost, and faster delivery of units that are ready to "plug and play".



McLEAN CENTRIFUGAL BLOWERS

- **Single, Dual, Radial**
- **Thousands of Configurations**
- **0-2,500 CFM, 0.0" to 9.0" Static Pressure**
- **115-230VAC, 12, 24, 48VDC**

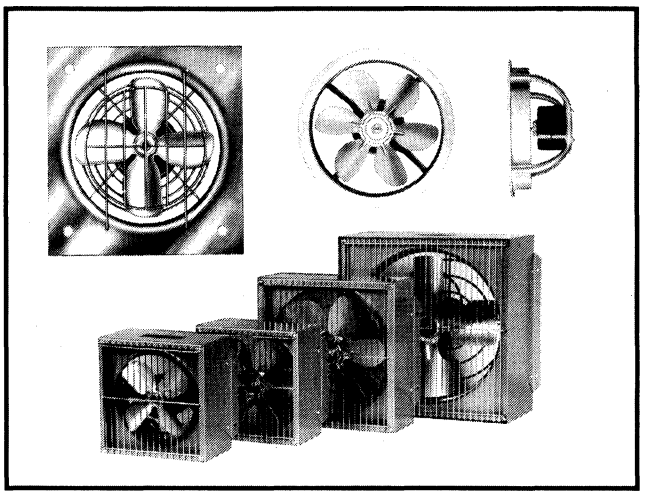
Applications limited only by your imagination! These McLean centrifugals are working full time worldwide cooling a full spectrum of electronic systems. Units are available with a range of wheel diameters, available with AC or DC power, and highly reliable heavy duty motors UL recognized and CSA approved. Standard, modified and custom housings, and mounting make short work of your cooling design problems.



McLEAN FANS

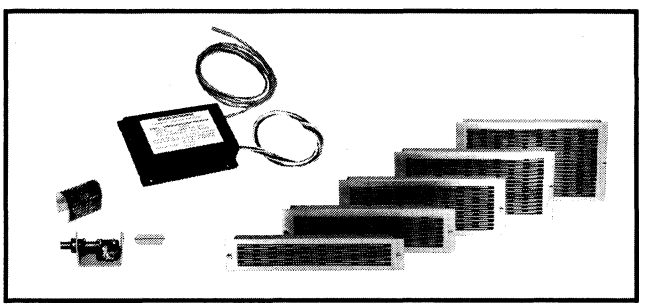
- **Filter Box, Orifice, Panel**
- **Rugged, Adaptable, Economical**
- **275 to 1,200 CFM, 0.0" to 2.5" Static Pressure**

Our range of prefiltered sizes, performance and configurations were designed with flexibility in mind. Units can pressurize or evacuate any enclosure, with vertical or horizontal mounting. Narrow depth dimensions allow flush, close-wall mounting where space is limited. Units are precisely balanced for quiet, vibration-free operation.



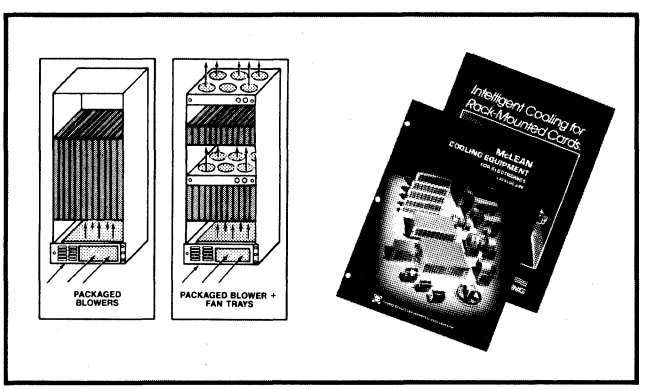
McLEAN ACCESSORIES

McLean offers a wide range of cooling product accessories, ranging from Filter Grille Panels, inlet or exhaust guards, airflow switches and controllers, and more. Accessories can be supplied mounted on order, or retrofitted to existing applications. Custom accessories, too.



DESIGN ASSISTANCE

McLean's design engineers have been winning the battle against electronically-generated heat for decades, and are ready and willing to apply that expertise to your cooling project. For custom and modified applications, our computer-aided design systems and testing laboratories are the industry's best. For standard applications, our print files contain thousands of proven cooling solutions ready to go to work for you right now. Call or write for our comprehensive literature!



72 HOUR SHIPMENT

Just three days—that's all it takes to put one of the McLean 72 hour units on the dock ready to ship to you, with overnight delivery if necessary. McLean has hundreds of units ready to manufacture from inventoried parts that can keep your supply surprises from turning into downtime.

72 HOURS

AND MORE...

- **Over 5,000 active designs** including MIL-SPEC
- **Shielded Cooling**
- **Heat Exchangers**
- **McLean Motors**

Call Us!

ZERO McLEAN ENGINEERING

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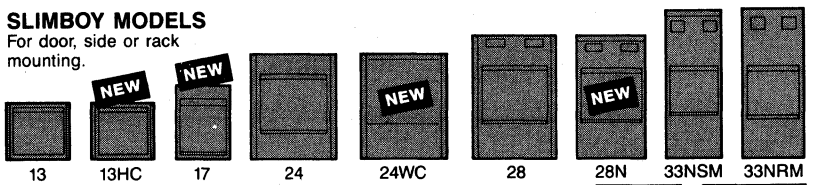
YOUR SINGLE SOURCE AIR FORCE

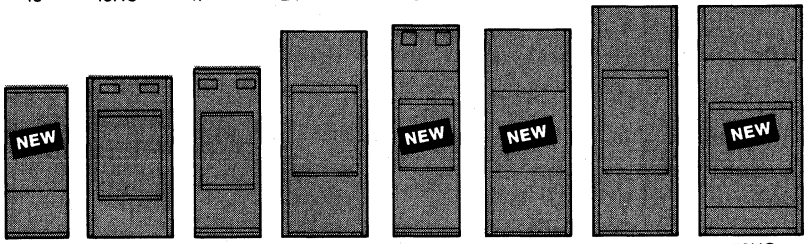
COOLING ELECTRICAL & ELECTRONIC ENCLOSURES

SLIMBOY MODELS

For door, side or rack mounting.



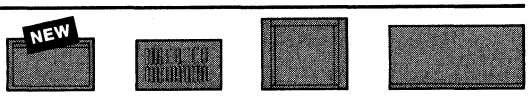
13 13HC 17 24 24WC 28 28N 33NSM 33NRM



33WC 36 36N 47 47N 47WC 52 52HC

HIBOY MODELS

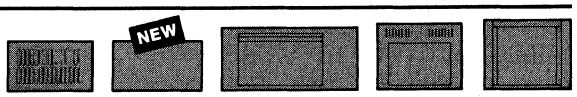
For top, side and rack mounting. Cool air blows down.



11TSM 11RM 16 30TSM

LOBOY MODELS

For side or rack mounting. Cool air blows up.



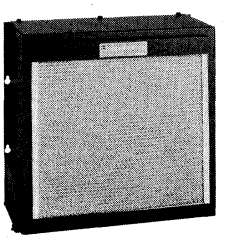
11 11WC 12 14 16

MODEL	BTU/HR CAPACITY (In Thousands)	DIMENSIONS (" High x Deep x Wide)	FEATURES
Slimboy 13	1.2	$12^{7}/_{8} \times 6^{1}/_{4} \times 14^{1}/_{8}$	Compact and quiet.
Slimboy 13HC	1.4	$12^{7}/_{8} \times 6^{1}/_{4} \times 14^{1}/_{8}$	Higher capacity in micro-mini size.
Slimboy 17	2	$17 \times 7^{1}/_{4} \times 12$	High capacity. Compact. Evaporates condensate.
Slimboy 24	1.4,2,3	$24 \times 9^{1}/_{8} \times 19$	Outstanding cooling efficiency.
Slimboy 24WC	2,4	$24 \times 9^{3}/_{16} \times 19$	Water cooled. For adverse environments.
Slimboy 28	2,3,4 ,5,6	$28^{1}/_{2} \times 9^{1}/_{8} \times 19$	Popular size. Standard of the industry.
Slimboy 28N	2,3,4 ,5,6	$30 \times 9^{1}/_{8} \times 17$	Popular series in narrow package.
Slimboy 33NSM	2,4	$34^{1}/_{8} \times 8^{13}/_{16} \times 12^{3}/_{8}$	Narrow surface mount. High capacity.
Slimboy 33NRM	2,4	$34^{1}/_{4} \times 8^{7}/_{8} \times 13^{3}/_{4}$	Narrow. Fully recessed mount.
Slimboy 33WC	2,4	$34^{1}/_{8} \times 8^{3}/_{4} \times 12^{3}/_{8}$	Water cooled. Narrow. For adverse environs.
Slimboy 36	4,5,6,8	$36^{11}/_{16} \times 10 \times 19$	Wide range of capacities.
Slimboy 36N	4,5,6	$38^{11}/_{16} \times 10 \times 15$	Popular 36 in narrow package.
Slimboy 47	4,5,6	$47^{1}/_{4} \times 10 \times 19$	Height increases cooling effectiveness.
Slimboy 47N	7,8,9,10	$49^{1}/_{8} \times 10 \times 15$	Higher capacities in narrow package.
Slimboy 47WC	4,6,8,12	$47^{1}/_{4} \times 10 \times 19$	Water cooled for harsh environs. Wide range.
Slimboy 52	5,6,7,8,9,10,12	$52^{5}/_{8} \times 9^{1}/_{2} \times 19$	Widest range of capacities.
Slimboy 52HC	14,16,19	$52^{1}/_{2} \times 12^{7}/_{8} \times 23$	Greatest cooling capacity.
Hiboy 11TSM	2,3,4	$10^{1}/_{4} \times 20 \times 17$	Top surface mount. Low profile. Evaporates condensate.
Hiboy 11RM	2,3,4	$10^{15}/_{32} \times 19^{5}/_{8} \times 19$	Rack mount. Minimum space requirement.
Hiboy 16	5,6,7,8,9	$15^{23}/_{32} \times 25^{3}/_{16} \times 19$	Wide range of cooling capacities.
Hiboy 30TSM	4,5,6	$14 \times 31^{3}/_{8} \times 16^{3}/_{8}$	Top surface mount. For narrow enclosures.
Loboy 11	2,3,4	$10^{15}/_{32} \times 19^{5}/_{8} \times 19$	Minimum space requirement.
Loboy 11WC	2,4	$10^{15}/_{32} \times 19^{5}/_{8} \times 19$	Water cooled for harsh environs. Minimum space.
Loboy 12	2,4	$11^{1}/_{8} \times 14^{7}/_{8} \times 24^{1}/_{2}$	For narrow enclosures.
Loboy 14	4,5,6,7	$14^{3}/_{4} \times 23^{5}/_{8} \times 19$	Higher capacity. No rear ducting.
Loboy 16	5,6,7,8,9,10	$15^{23}/_{32} \times 24 \times 19$	Wide range of capacities. Evaporates condensate.

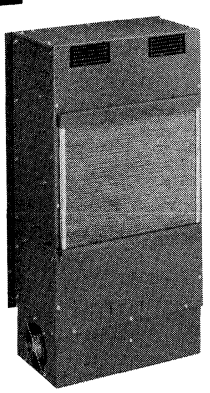
Condensate Evaporator — Mounts to underside of Slimboy when floor drain not available.

CLOSED-LOOP AIR CONDITIONERS

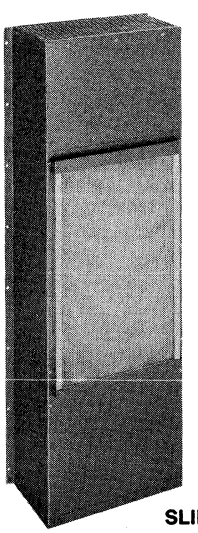
A McLean Midwest air conditioner should be employed when the temperature inside the electronic enclosure must be at or below the ambient temperature, and humidity must be removed. Closed-loop design seals out hostile ambient air.



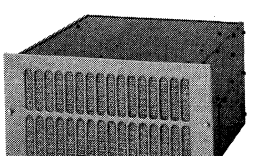
SLIMBOY 13HC



SLIMBOY 28 WITH CONDENSATE EVAPORATOR



SLIMBOY 52

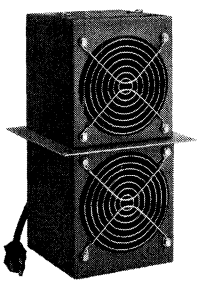


HIBOY 11RM

Largest line of Air Conditioners & Heat Exchangers from the leader in closed-loop cooling systems. Distributed & serviced worldwide.

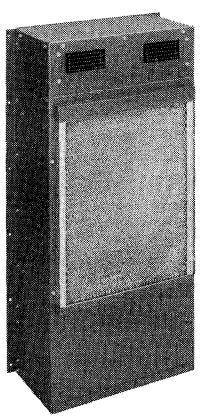
CLOSED-LOOP HEAT EXCHANGERS

A McLean Midwest heat exchanger can be used to transfer heat from inside the enclosure to the outside atmosphere when the electronic controls can operate at a temperature differential slightly above the ambient. Heat exchangers provide low-cost, efficient cooling. Closed-loop design locks out hostile ambient air.



HE-11

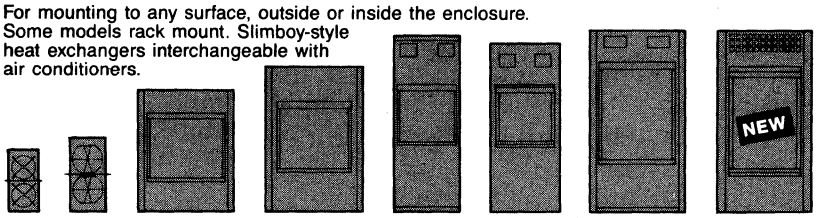
HX-26DF



HE-36

MODELS WITH MODIFIED HEAT PIPE CORE

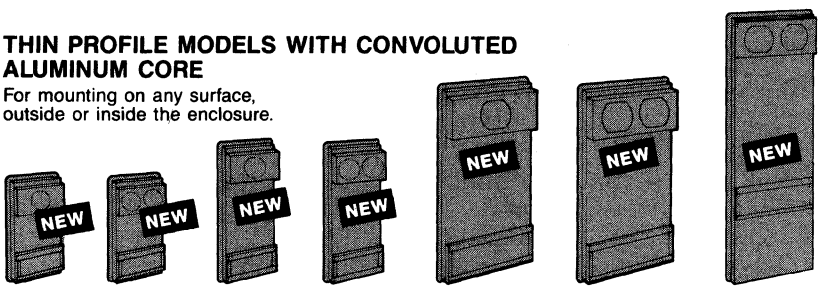
For mounting to any surface, outside or inside the enclosure. Some models rack mount. Slimboy-style heat exchangers interchangeable with air conditioners.



HE-11 HE-15 HE-24 HE-28 HE-33NSM HE-33NRM HE-36 HE-36HC

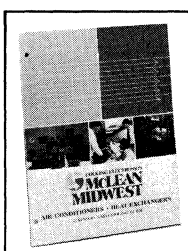
THIN PROFILE MODELS WITH CONVOLUTED ALUMINUM CORE

For mounting on any surface, outside or inside the enclosure.



HX-20SF HX-20DF HX-26SF HX-26DF HX-38SF HX-38DF HX-60DF

MODEL	W/°F EFFICIENCY RATING Air Out	Avg.	Air In	DIMENSIONS (" High x Deep x Wide)
HE-11	13	7	5	$11^{5}/_{16}$ x $5^{1}/_{4}$ x $5^{1}/_{8}$
HE-15	36	27	21	15 x $7^{7}/_{8}$ x $7^{1}/_{8}$
HE-24	54	38	28	24 x $9^{1}/_{8}$ x 19
HE-28	57	39	28	$28^{1}/_{2}$ x $8^{11}/_{16}$ x 19
HE-33NSM	61	38	26	$34^{1}/_{8}$ x $8^{13}/_{16}$ x $12^{3}/_{8}$
HE-33NRM	61	38	26	$34^{1}/_{4}$ x $8^{7}/_{8}$ x $13^{3}/_{4}$
HE-36	57	37	25	$36^{11}/_{16}$ x $8^{11}/_{36}$ x 19
HE-36HC	93	52	34	$36^{11}/_{16}$ x $12^{9}/_{16}$ x 19
HX-20SF Single Fan	13	10	7	$20^{3}/_{16}$ x $2^{1}/_{16}$ x $11^{3}/_{16}$
HX-20DF Double Fan	15	10	7	$20^{3}/_{16}$ x $2^{1}/_{16}$ x $11^{3}/_{16}$
HX-26SF Single Fan	16	11	8	$26^{3}/_{16}$ x $2^{1}/_{16}$ x $11^{3}/_{16}$
HX-26DF Double Fan	16	11	8	$26^{3}/_{16}$ x $2^{1}/_{16}$ x $11^{3}/_{16}$
HX-38SF Single Fan	74	33	18	$38^{1}/_{4}$ x $2^{1}/_{16}$ x 20
HX-38DF Double Fan	69	37	22	$38^{1}/_{4}$ x $2^{1}/_{16}$ x 20
HX-60DF Double Fan	57	35	23	$59^{7}/_{8}$ x $2^{1}/_{16}$ x $19^{27}/_{32}$



108 PAGE CATALOG/ COOLING GUIDE

Ask for your FREE copy today. A real resource tool for cooling electronics. Extensive section on how to select the right unit for a specific application.

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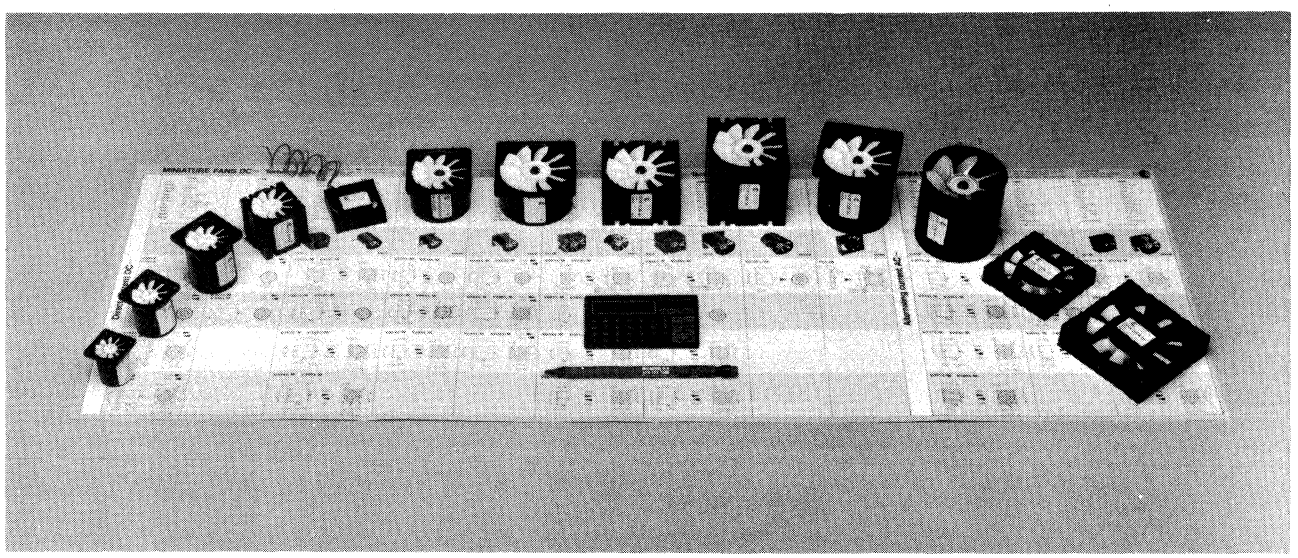
D.C. ULTRA-MINIATURE FANS
D.C. ULTRA-EFFICIENT FANS
D.C. BRUSHLESS-ULTRA SLIM FANS



RANGE OF PERFORMANCE

Micronel's ultra miniature fans range in diameter from 0.95 inches to 3.15 inches. **Fan lengths** range from 0.47 inches to 2.36 inches. **Air delivery,** at zero back pressure, is from 1 CFM to 52 CFM. **D.C. operational voltages** range from 1.5V to 48 VDC. Power input range from 0.01 to 0.2 watts per CFM.

D.C. FANS TYPE	AIR FLOW CFM	RATED VOLTAGE VOLTS	MAX SPEED RPM	MAX NOISE DBA	MAX POWER WATTS	SIZE ∅ = DIA. INCHES ☐ = SQ. INCHES
V240	3.2	6/12	14,500	43	0.3	0.95 ∅ X 1.18
V300	5.6	6/12/24	14,000	41	0.84	1.18 ∅ X 1.42
F34/39/44	5.6	12/24	5,600	29	1.4	1.61 ☐ X 0.47
V340	12.6	6/12/24	13,000	45	1.1	1.42 ∅ X 1.42
V350	12.6	6/12/24	13,000	52	1.2	1.5 ☐ X 1.42
V360	12.6	6/12/24	13,000	45	1.2	1.42 ∅ X 1.77
V460	12.6	6/12	4,200	28	0.24	1.89 ∅ X 1.42
V570	19.0	6/12	3,700	27	0.42	2.44 ☐ X 1.42
V580	19.0	6/12	3,700	27	0.42	2.36 ∅ X 1.42
V591	52.0	6/12/24	10,200	56	8.4	2.44 ☐ X 2.36
V600	52.0	6/12/24	10,200	56	8.4	2.36 ∅ X 2.36
VD65	50.0	6/12/24	8,800	53	9.2	2.56 ∅ X 2.56
F52/57/62	9/12/14	5/12/24	4,250	22/32/38	1.3	2.44 ☐ X 0.55
F70/75/80	14/21/28	5/12/24	3,600	23/32/42	4.0	3.15 ☐ X 0.71

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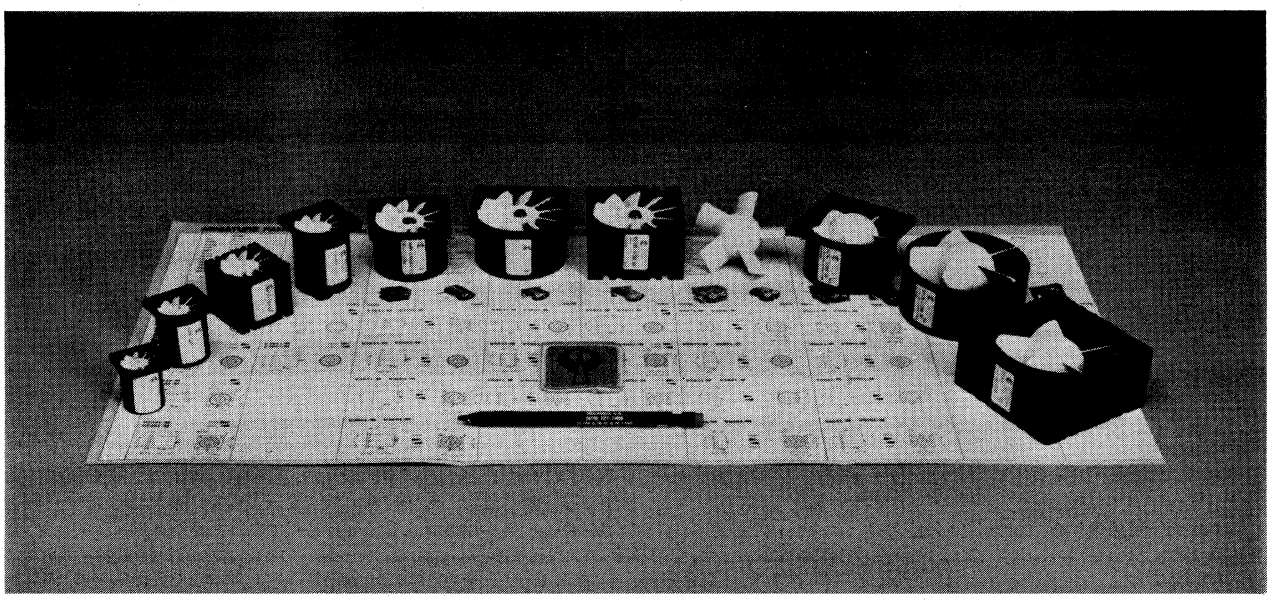
A.C. ULTRA-MINIATURE FANS
A.C. ULTRA-EFFICIENT FANS
A.C. BRUSHLESS-ULTRA SLIM FANS



RANGE OF PERFORMANCE

Micronel's line of high efficiency two phase AC fans are U.L. and CSA approved. Size range from 1.2 inches to 3.15 inches in diameter. **Fan lengths** range from .71 to 1.5 inches. **Air delivery,** at zero back pressure, range from 2.3 CFM to 36 CFM. **AC operational voltages** of 12, 24, and 115 volts, 50/60 hertz are standard. Non-standard voltages are available on special order.

A.C. FANS TYPE	AIR FLOW CFM	RATED VOLTAGE VOLTS	MAX SPEED RPM	MAX NOISE DBA	MAX POWER V.A.	SIZE ∅=DIA. INCHES ☐= SQ. INCHES
V300	2.3	12/24/115	3,000	14	3.	1.42 ∅ X 1.42
V460	5.0	12/24/115	3,000	14	3.2	1.89 ∅ X 1.42
V570	15.0	12/24/115	3,000	24	3.4	2.44 ☐ X 1.42
V580	15.0	12/24/115	3,000	24	3.4	2.36 ∅ X 1.42
V600	17.0	12/24/115	3,000	22	6.9	2.36 ∅ X 1.42
V60	17.	12/24/115	2,800	16	3.2	2.36 ∅ X 1.26+
V72AB	13.6	12/24/115	3,000	26	6.9	2.84 ∅ X 1.42+
V72CL/PM/JM	36.	12/24/115	2,900	32	6.9	3.15 ☐ X 1.50
F80	28.	12/24/115	3,600	42	4.0	3.15 ☐ X 0.71

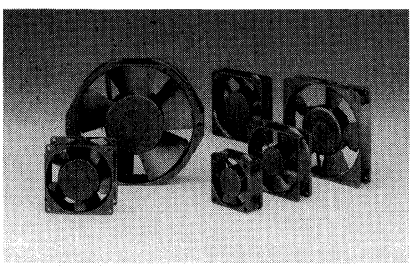
+ Frameless units.

NMB TECHNOLOGIES

BOXER™ AXIAL COOLING FANS

NMB Technologies is a major producer of axial flow fans featuring high quality, long life.

FEATURES



Boxer cooling fans feature aluminum alloy or plastic frames, UL 94 V-O flammable rated impellers, Class A insulation, precision ball bearings, −40° to +70° temperature range and a complete line of accessories. Low power and current consumption.

BENEFITS

- Reliable Quality — All components made in-house.
- More than 100 Models.
- Low Noise, Light Weight.
- 50,000 Hour Life (Min) utilizing NMB Precision Bearings.
- All units designed to meet UL, CSA, and VDE.
- Auto-restart standard on DC fans.

DC FANS AND AC FANS

OPTIONS FOR DC FANS AND AC FANS

1. Most DC fans available at either 12 VDC (±15%) or 24 VDC (±15%).
2. Standard voltages for AC fans are available in 115 VAC (230 VAC by special request).
3. Models are available with either terminals or lead wires.
4. Speed sensing available on selected DC models.
5. Ultra quiet DC version available. (Approximately 4 dBA — 10 dBA lower noise level). See NL Series.

MODEL NUMBER	CFM	NOISE	SIZE (IN.)
DC-SERIES FANS			
2408PL-04W-B30	9	28	2.36 × 0.79
-B40	12	35	2.36 × 0.79
2410PL-04W-B20	9	25	2.36 × 0.98
-B30	14	30	2.36 × 0.98
-B40	19	37	2.36 × 0.98
3110PL-04W-B20	24	27	3.15 × 1.00
-B30	27	34	3.15 × 1.00
-B40	32	38	3.15 × 1.00
3610PL-04W-B20	31	33	3.62 × 1.02
-B30	47	39	3.62 × 1.02
4710PL-04W-B20	53	33	4.69 × 1.00
-B30	71	38	4.69 × 1.00
4715ML-04W-B30	100	41	4.72 × 1.51
4715PL-04W-B20	75	38	4.72 × 1.51
-B30	95	42	4.72 × 1.51

MODEL NUMBER 50/60 Hz	CFM	NOISE	SIZE (IN.)
AC-SERIES FANS			
2412PS-12W-B30	10	29	2.36 × 1.18
3110PS-12W-B30	20	33	3.15 × 0.98
3115FS-12T-B00	18	31	3.15 × 1.50
-B10	21.5	36	3.15 × 1.50
-B20	27	40	3.15 × 1.50
-B30	32	44	3.15 × 1.50

MODEL NUMBER 50/60 Hz	CFM	NOISE	SIZE (IN.)
AC SERIES FANS (Cont'd)			
3115PS-12T-B10	26	25	3.15 × 1.50
-B20	28	31	3.15 × 1.50
-B30	34	38	3.15 × 1.50
3610PS-12T-B10	22	25	3.62 × 1.02
-B20	30	35	3.62 × 1.02
-B30	35	38	3.62 × 1.02
4710PS-12T-B20	57	30	4.69 × 1.00
-B30	77	38	4.69 × 1.00
4715FS-12T-B00	60	40	4.72 × 1.51
-B10	70	41	4.72 × 1.51
-B20	80	43	4.72 × 1.51
-B30	90	53	4.72 × 1.51
-B40	100	55	4.72 × 1.51
-B50	110	56	4.72 × 1.51
4715MS-12T-B10	54	28	4.72 × 1.51
-B20	76	30	4.72 × 1.51
-B30	98	37	4.72 × 1.51
-B40	105	39	4.72 × 1.51
-B50	112	41	4.72 × 1.51
4715PS-12T-B10	65	28	4.69 × 1.50
-B20	98	43	4.69 × 1.50
-B30	106	46	4.69 × 1.50
5915PC-12T-B10	110	38	6.77 × 1.50
-B20	170	50	6.77 × 1.50
-B30	220	56	6.77 × 1.50

NMB || NMB TECHNOLOGIES INCORPORATED

BOXER FAN DIVISION

For complete specifications and pricing, contact

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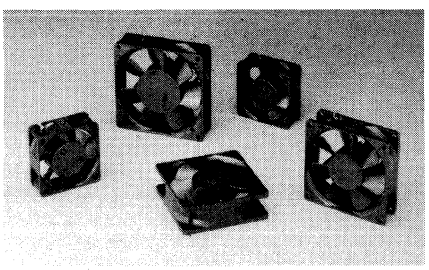
9730 Independence Ave., Chatsworth, CA 91311 • Telephone (818) 341-3355
FAX: (818) 341-8207 • TWX: (910) 494-1232 • Telex Number: 651340

NMB TECHNOLOGIES

LOW NOISE DC COOLING FANS

NMB Technologies is now producing Boxer™ axial flow DC fans that are quieter by up to 10 dBA than competitive products.

FEATURES



Low noise DC cooling fans feature lightweight engineered plastic frames, aerodynamically designed seven-bladed impellers, brushless DC motors, precision ball bearings, −40° to +70°C temperature range, Class A insulation and a complete line of accessories.

BENEFITS

- Low Noise, Light Weight.
- All units designed to meet UL and CSA.
- Auto-restart is standard.
- Speed Sensor or Locked Rotor Alarm option.
- 50,000 Hour Life (Min) utilizing NMB Precision Bearings.
- Reliable Quality — All components made in-house.

NL SERIES FANS

2410 NL SERIES 2.36 (60) × .98 (25)	RATED VOLTAGE	OPERATING VOLTAGE	INPUT POWER	RATED CURRENT	MAXIMUM AIR FLOW	MAXIMUM AIR PRESSURE	SPEED	NOISE LEVEL
	VDC	VDC	W	A	CFM (m^3/min)	In H_2O (mmAq)	rpm	dB-A
2410NL-04W-B10	12	6-13.8	0.96	0.08	12 (0.33)	0.79 (2.0)	3000	24
2410NL-04W-B20	12	6-13.8	1.08	0.09	13 (0.38)	0.98 (2.5)	3300	26
2410NL-04W-B30	12	6-13.8	1.20	0.10	17 (0.47)	1.46 (3.7)	4000	29
2410NL-04W-B40	12	6-13.8	1.68	0.14	19 (0.55)	1.85 (4.7)	4600	33
2410NL-04W-B50	12	6-13.8	2.52	0.21	23 (0.65)	2.40 (6.2)	5300	38
3110NL SERIES 3.15 (80) × 1.0 (25.4)								
3110NL-04W-B10	12	6-13.8	0.84	0.07	23 (0.65)	0.63 (1.60)	1950	20
3110NL-04W-B20	12	6-13.8	0.96	0.08	27 (0.75)	0.73 (1.85)	2150	23
3110NL-04W-B30	12	6-13.8	1.20	0.10	30 (0.85)	0.87 (2.20)	2450	25
3110NL-04W-B40	12	6-13.8	1.80	0.15	39 (1.00)	1.38 (3.50)	2950	32
3110NL-04W-B50	12	6-13.8	2.64	0.22	44 (1.20)	1.89 (4.80)	3400	36
3610NL SERIES 3.62 (92) × 1.02 (25.8)								
3610NL-04W-B10	12	6-13.8	1.20	0.10	31 (0.90)	0.91 (2.3)	2000	24
3610NL-04W-B20	12	6-13.8	1.56	0.13	35 (1.00)	1.18 (3.0)	2300	27
3610NL-04W-B30	12	6-13.8	2.16	0.18	42 (1.20)	1.50 (4.0)	2700	32
3610NL-04W-B40	12	6-13.8	3.24	0.27	51 (1.45)	2.16 (5.5)	3100	36
4710NL SERIES 4.69 (119) × 1.0 (25.4)								
4710NL-04W-B10	12	6-13.8	1.44	0.12	50 (1.42)	.06 (1.50)	1400	25
4710NL-04W-B20	12	6-13.8	1.80	0.15	60 (1.70)	.08 (2.00)	1600	29
4710NL-04W-B30	12	6-13.8	2.88	0.24	70 (1.98)	.11 (2.75)	1900	34
4710NL-04W-B40	12	6-13.8	4.08	0.34	80 (2.27)	.14 (3.50)	2150	36
4710NL-04W-B50	12	6-13.8	6.84	0.57	90 (2.55)	.18 (4.50)	2400	39

OPTIONS

1. Most DC fans available at either 12VDC (±15%) or 24 VDC (±15%).
2. Models are available with either terminals or lead wires.

NMB TECHNOLOGIES INCORPORATED
BOXER FAN DIVISION

For complete specifications and pricing, contact
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ORIX® FAN

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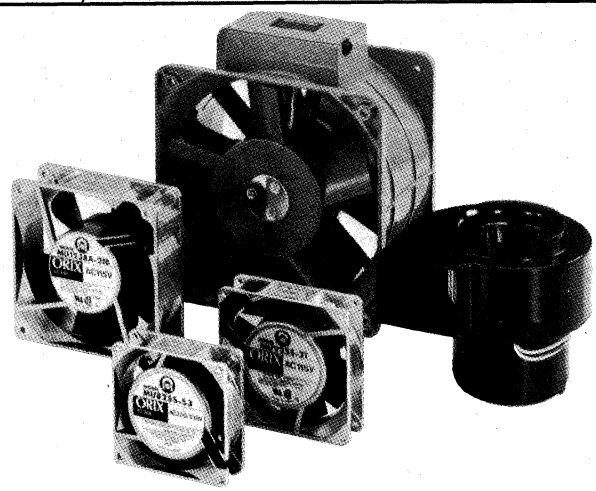
ALL BALL BEARING
HIGH QUALITY



Typical Fan Types and Uses

AC Axial Flow Fans (MU Series)

MU series fans use a shaded-pole motor. The fan has an aluminum diecast frame, the propeller is fabricated from UL-approved glass-filled polycarbonate resin, and the bearings are the largest possible ball bearings. These fans are thus light, robust, highly reliable and long-lasting. They are ideal for applications where forced cooling is necessary.

AC 115 volt versions: (also available in 230V)

Square x Depth	Model	CFM	dBa
4.69"x1.50"	**MU1238A-21B**	106	46
	MU1238B-21B	88	40
4.69"x1.50"	**MU1238K-21B**	74	39
	MU1238L-21B	60	34
4.69"x0.98"	**MU1225S-21**	63	42
	MU1225M-21	56	39
3.62"x0.98"	**MU925S-21**	39	42
	MU925M-21	35	38
3.15"x0.98"	**MU825S-23**	19	35

DC Brushless Axial Flow Fans (MD Series)

The MD series fan uses a brushless DC motor to turn the fan blades. It is highly efficient and has low power consumption. They have high air-flow with low noise and vibration. These fans are unaffected by the primary power supply, whether it is 100VAC, 115VAC or 230VAC, so it can be used in equipment which is shipped anywhere in the world. The MD fans have exceptionally long life because they use the largest ball bearing possible for their size, have very low temperature rise, and have no brushes to wear out. They are ideal for a wide variety of applications where forced air cooling is necessary.

DC Brushless Versions 12VDC (also available in 24VDC)

Square x Depth	Model	CFM	dBa
2.05"x0.63"	**MD516B-12**	7.0	27
2.44"x1.00"	**MD625B-12**	17.6	38
	MD625BM-12	13.0	31
	MD625BL-12	8.8	25
3.15"x1.00"	**MD825B-12**	35.3	45
	MD925BM-12	25.7	36
	MD825BL-12	18.7	29
3.62"x1.00"	**MD925A-12**	35.3	38
	MD925AM-12	28.2	35
	MD925AL-12	21.2	29
4.69"x1.00"	**MD1225A-12**	88.3	49
	MD1225AM-12	67.1	43
	MD1225AL-12	49.4	36
4.69"x1.50"	**MD1238A-12**	106	46
	MD1238AM-12	88.3	41
	MD1238AL-12	67.1	34
6.77"dia x 2"	**MD1751C-24**	21.2	53
	MD1751CM-24	14.1	43

Propeller Fans (MR Series)

MR series fans are of special design employing the propeller principle. They are highly reliable and efficient, and produce minimal vibration, noise and leakage flux.
Each fan incorporates a device which emits an alarm signal in the event that the cooling performance drops, thus ensuring that the equipment being cooled does not overheat. Used extensively in high performance applications such as Mainframe computer cooling and clean benches (Laminar flow benches) where high pressure and air flow as well as long life are important.

MR Fans (230V 60 Hz 3 phase, also available in other voltages and phase inputs)

Square x Depth	Model	CFM	Inches of Water
7.09"x2.60"	**MR18-TTAUL**	353	0.59
7.09"x4.33"	**MRW18-TTAUL**	494	1.26

ORIENTAL MOTOR®
ORIENTAL MOTOR U.S.A. CORPORATION

FOR MORE INFORMATION CALL: LOS ANGELES (213) 515-2264; SAN JOSE (408) 988-2655; CHICAGO (312) 577-0310; NEW YORK (201) 882-0480

Fans & Blowers

MULTIFAN

PAPST MECHATRONIC CORPORATION

PAPST MECHATRONIC CORPORATION, Aquidneck Industrial Park, Newport, Rhode Island 02840 • Tel. (401) 849-8810 • Telefax 401/849-4640 • Telex 95 20 92

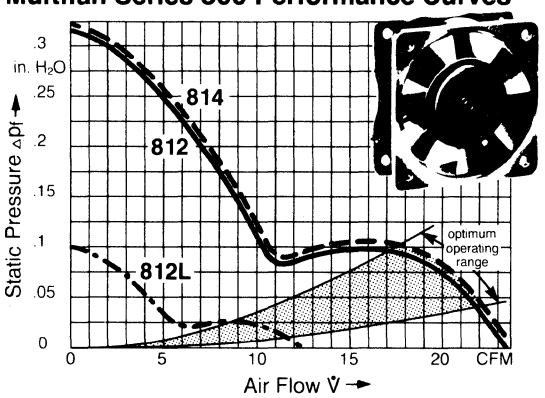
- Latest State Of The Art
- DC Fans with outstanding performance/ price relationship
- Low noise
- May be operated within a range of 50% to 125% of the Rated Power Voltage
- Fiberglass-reinforced housing
- Brushless electronically commutated motor
- Long operating life without maintenance
- Available in four series

Multifan Quick Selection Guide

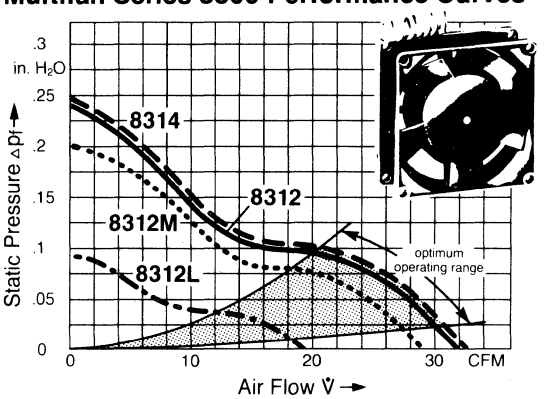
Model	Voltage Range VDC	Airflow Range CFM	Nominal Input Power (zero static pressure) Watts	Frame Size inches
812L	6-15	6-16	.66	2-7/16 sq. x 1 D
812	6-15	6-29	3	2-7/16 sq. x 1 D
814	12-30	6-29	3	2-7/16 sq. x 1 D
8312L	6-15	6-24	1	3-1/8 sq. x 1-1/4 D
8312M	6-15	6-34	1.8	3-1/8 sq. x 1-1/4 D
8312	6-15	6-38	2.2	3-1/8 sq. x 1-1/4 D
8314	12-28	6-36	2.2	3-1/8 sq. x 1-1/4 D

Model	Voltage Range VDC	Airflow Range CFM	Nominal Input Power (zero static pressure) Watts	Frame Size inches
3312L	6-15	6-40	1.4	3-5/8 sq. x 1-1/4 D
3312	6-15	6-58	2.4	3-5/8 sq. x 1-1/4 D
3314	12-28	6-54	2.4	3-5/8 sq. x 1-1/4 D
4312L	6-15	6-70	1.2	4-11/16 sq. x 1-1/4 D
4312M	6-15	6-100	2.6	4-11/16 sq. x 1-1/4 D
4312	6-15	6-120	5	4-11/16 sq. x 1-1/4 D
4314	12-28	6-110	5	4-11/16 sq. x 1-1/4 D

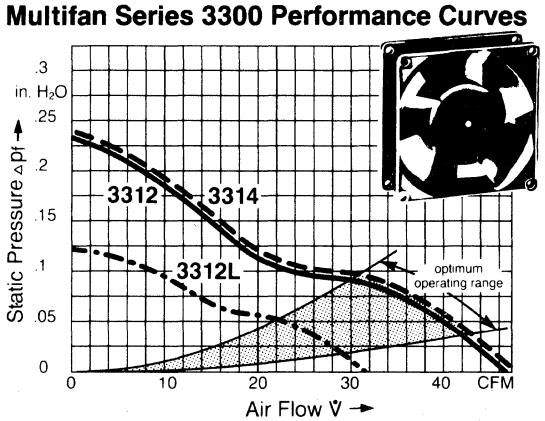
Multifan Series 800 Performance Curves



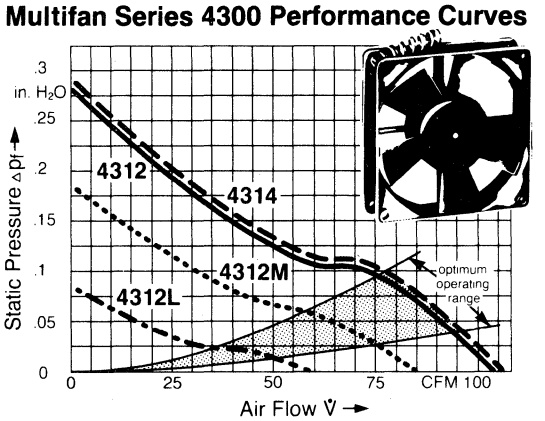
Multifan Series 8300 Performance Curves



Multifan Series 3300 Performance Curves



Multifan Series 4300 Performance Curves



Fans & Blowers

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PAPST/PAMOTOR AC FANS

Field proven, quality products you can rely upon for all of your cooling requirements.

PAPST/PAMOTOR offers a wide variety of fans for your selection. Each model combines the features of extended life with high airflow delivery at low noise levels.

Lightweight all-metal construction is typical of PAPST/PAMOTOR AC fans. This all-metal construction eliminates breakage and warping often found in conventional plastic fans. This all-metal feature also permits the entire fan to function as a natural heat sink, assuring cooler operation by effectively transferring heat from the rotor into the air stream via the impeller blades. Potential injurious heat is also transferred from the stator to the die-cast venturi by way of the metal struts. Life expectancy: (1) AC fans with sleeve bearings - 20,000 hours at maximum permissible ambient temperatures. (2) AC fans with ball bearings - 20,000 hours at 72° C or at the maximum permissible temperature if this is less than 72° C. Note: If the ambient temperature in which the fan operates is at 20° C below the above levels the life expectancy increases by 10,000 hours.

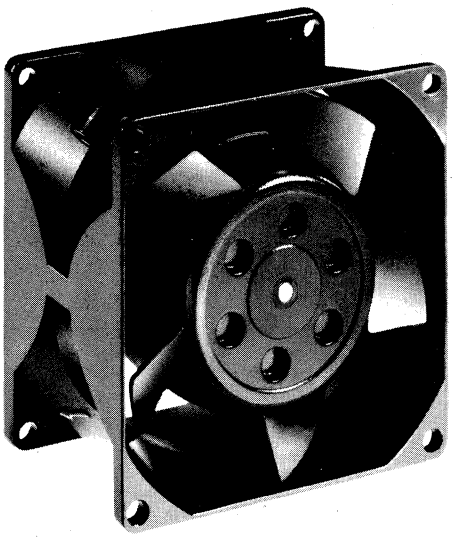
The PAPST/PAMOTOR exclusive bearing lubrication system incorporates hand-fitted broached sintered iron sleeve bearings on most fans, with precision high-temperature ball bearing versions also available. The dual sleeve bearings are separated by a large oil felt reservoir, which provides continuous fault free circulation of a special lubricant to the shaft and bearing surface.

An efficient, powerful inside-out motor, housed entirely within the impeller hub to conserve axial depth, has higher torque capabilities and a lower internal heat rise than the contemporary fixed shaft designs.

The impeller blades are computer designed and impulse welded to the precision hub and dynamically balanced to within .0001 inches in each end plane to minimize acoustical and mechanical vibrations.

PAPST/PAMOTOR also offers a super premium grade fan; (5 year warranty).

Perhaps the two most important fields of application for premium grade fans are: (1) in limited-production deluxe equipment, in professional-grade instrumentation, in few-of-a-kind, custom-designed and permanently-installed systems requiring optimum performance and absolute dependability for many years; and (2) as field replacements for retrofit units for original-equipment fans that have proven to be unreliable, are too noisy, or do not produce sufficient cooling airflow.



PAPST/PAMOTOR fans are Underwriters' Laboratories, Inc. recognized and have their Yellow Card Component Recognition Number E41168. Many are CSA certified and VDE approved.

AC Fans Quick Selection Guide

Model	Operating Voltage VAC	Frequency Hz	Airflow cfm	Frame Size inches
Shaded Pole Fans				
2500S	115	50/60	115	4-1/2 sq. x 2 D
2550S	230	50/60	115	
4600X	115	50/60	120	4-11/16 sq. x 1-1/2 D
4600XP	115	50/60	120	
4606X*	115	50/60	120	
4650X	230	50/60	120	
4656X*	230	50/60	120	
4800X	115	50/60	70	
4850X	230	50/60	70	
7600S	115	50/60	240	6 dia. x 2-3/16 D
7606*	115	50/60	240	
7650S	230	50/60	240	
7656*	230	50/60	240	
8500D	115	50/60	40	3-1/8 sq. x 1-1/2 D
8500DP	115	50/60	40	
8506D*	115	50/60	40	
8550D	230	50/60	40	
8556D*	230	50/60	40	
8800D	115	50/60	27	
8850D	230	50/60	27	
Induction Type Fans				
900†	24-42	50/60	20-27	3-1/8 dia. x 1-1/2 D
950†	24	50/60	40	3 dia. x 1-1/2 D
6008S*	115	50/60	250	6-3/4 dia. x 2 D
6058S*	230	50/60	250	6-3/4 dia. x 2 D
Radial Blower				
RL90-18/00	115	50/60	25	4-3/4 sq. x 1-1/2 D

*High temperature ball bearing models.
†Models 900 & 950 require an additional capacitor.

Fans & Blowers

PAMOTOR

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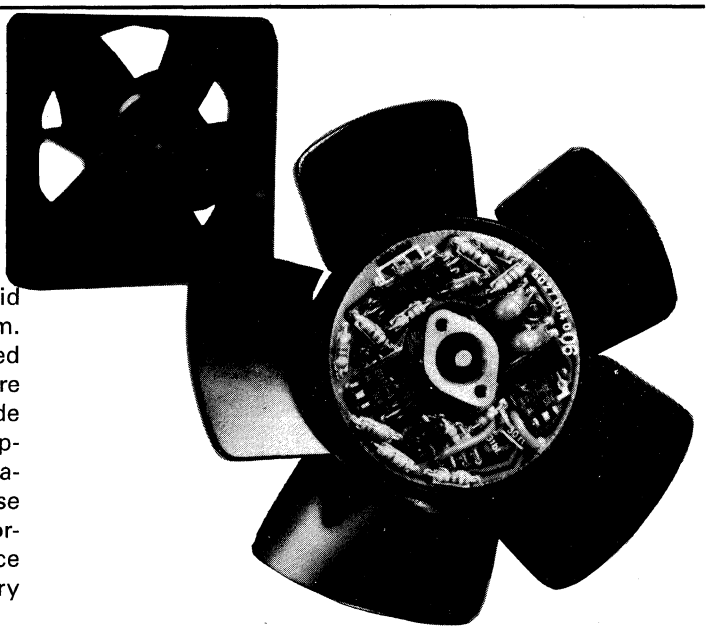
PAPST/PAMOTOR SOLID STATE BRUSHLESS DC FANS

THE ONLY COMPANY OFFERING YOU A FULL FAMILY OF SOLID STATE, BRUSHLESS DC FANS IN POPULAR FRAME SIZES & VOLTAGES, & AT POPULAR PRICES.



PAPST/PAMOTOR has a full line of self-contained, solid state, brushless DC fans for you to choose from. Through their design, these fans have been engineered to tackle those specialized applications which require highly reliable DC performance. Common uses include mobile radio equipment, medical electronics, shipboard computers, airborne applications, communications systems, automotive applications, marine use and telecommunications; wherever DC voltage is normally available. They are also finding wide acceptance for use in power stand-by modes to prevent memory loss in the event of AC power failure.

These fans are especially efficient and will outperform similar sized fans at normal operating back pressure. Typically, they offer greater air volume (cfm), reduced noise levels and reduced power drain. For example, the power drain at maximum back pressure is approximately 25% of that required in conventional AC units. These fans also achieve a new low in magnetic radiation and RF noise, thereby assuring the pure signals necessary for critical airborne or shipboard use.

These fans work well at all rated voltages, and are extremely quiet. They can be adjusted for performance and noise level by altering the voltage within the voltage range for your particular application. They feature a brushless motor with all electronics mounted on a PC card within the motor frame. Drive amplifiers for the motor are controlled by a patented Hall-effect generator circuit which is coupled by small pole pieces to the motor's field magnet (Patent No. 3-873-897). Available voltages include 5 VDC nominal, 12 VDC nominal, 24 VDC nominal and 48 VDC nominal.

The brushless DC motor is polarity protected* to avoid accidental damage and costly down time. If the input polarity is accidentally reversed, integral diodes block all circuits and the motor simply stops. Even in a locked rotor condition,* the motor goes into a neutral state to avoid damage. Precision bearings and lubricants help to achieve a life expectancy of 35,000 hours (sleeve bearing) and 60,000 hours (ball bearing) at maximum permissible ambient temperature. Note: If the ambient temperature in which the fan operates is at 20° C below the above levels the life expectancy increases by 10,000 hours.

*Except for 5 Volt models.

These fans do not require an external voltage inverter. This means that you save valuable mounting space and weight because the only consideration in mounting is the fan itself. This new concept has eliminated many of the inherent reliability and RF noise problems generally associated with using AC motors in a DC environment.

DC Fans Quick Selection Guide

Model	Voltage Range	Airflow Range	Nominal Input Power (zero static pressure)	Frame Size
	VDC	cfm	Watts	inches
812	6-15	11-29	3.0	2-1/2 sq. x 1 D
814	12-30	11-29	3.0	
3124F	18-30	33-57	2.5	3-5/8 sq. x 1 D
4105GX	4.5-5.5	82-100	4.0	4-11/16 sq. x 1-1/2 D
4112X	9.5-14	82-122	4.0	
4112GX	8-16	60-120	4.3	
4112KX	8-14.5	75-125	6.0	
4124X	19-28	82-122	4.1	
4124GX	18-30	70-120	4.3	
4124KX	18-29	90-125	6.0	
4124F	18-30	80-120	6.0	4-11/16 sq. x 1 D
4148X	38-56	82-122	4.1	4-11/16 sq. x 1-1/2 D
6124	16-32	150-250	11.0	6-3/4 dia. x 2-3/16 D
6148	32-60	150-250	10.5	
8105G	4.5-5.5	31-40	2.5	3-1/8 sq. x 1-1/2 D
8112	9.5-14	28-41	2.9	
8112G	8-16	21-49	2.6	
8112K	8-16	20-48	3.0	
8124	19-28	28-41	3.0	
8124G	18-30	26-44	2.6	
8124K	18-30	27-44	3.0	
8148	38-56	30-41	3.1	
RL90-18/24	19-28	19-31	5.2	4-3/4 sq. x 1-1/2 D

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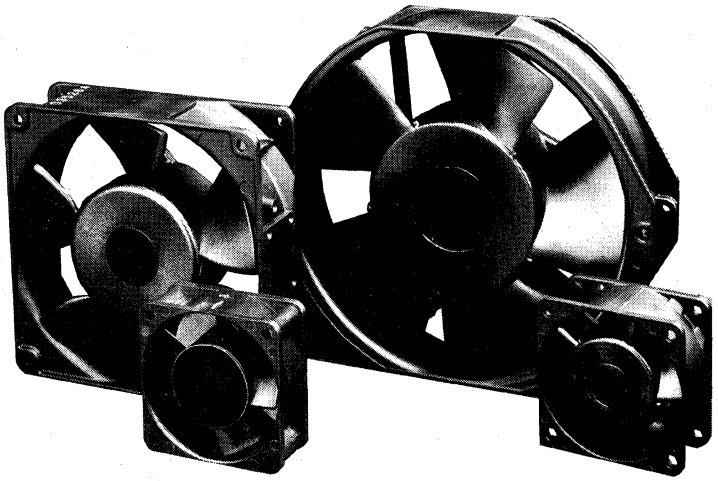
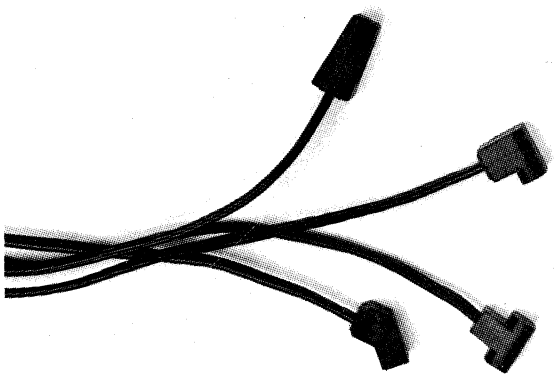
AC AND DC COOLING FANS

- Ball Bearing Construction, 50,000 hours minimum life
- Ultra Quiet
- Multiple Speeds
- Huge Inventory—over 150,000 fans
- Same day shipment
- UL/CSA/VDE Certifications
- Speed Sensing on DC Fans
- Low Power Consumption
- Over 100 Models





FAN POWER CORDS

Model #	Plug Style	Cord Length (In.)
07100	Straight	12, 24, 36 thru 80
07145	45°	12, 24, 36 thru 80
07190	90°	12, 24, 36 thru 80
07199	"T"	12, 24, 36 thru 80

Special lengths and Daisy Chain/multiple fan connections available upon request.

UL listed, CSA approved

Extensive Stock, Same Day Service

FINGER GUARDS

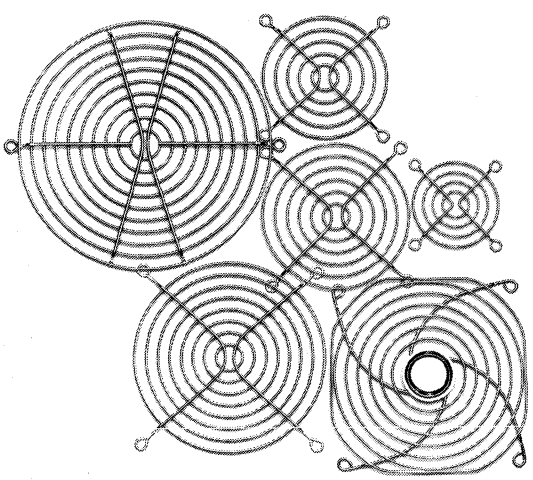
Basic Model #	Fan O.D.	Centerline Dim. of Mounting Holes
SG-14	1.4 in./40mm	1.26 in./32mm
SG-24	2.4 in./60mm	1.97 in./50mm
SG-31	3.1 in./80mm	2.8 in./71mm
SG-36	3.6 in./92mm	3.25 in./82mm
SG-47	4.7 in./120mm	4.13 in./105mm
SG-59	5.9 in./150mm	6.38 in./162mm

Finish-nickel chrome or black upon request

Meets UL spacing requirements

Plastic guards available in most frame sizes

Extensive Stock, Same Day Service



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MECHATRONICS

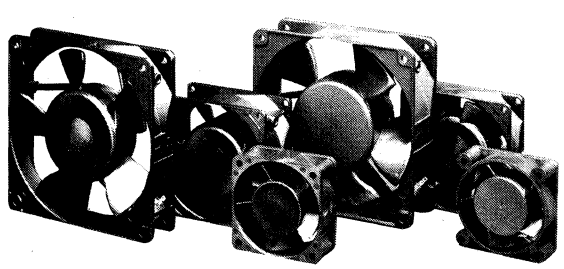
NMB TECHNOLOGIES INCORPORATED

DC-SERIES FANS

Model #	Volts	Voltage Range	Watts	mAMPS	Speed	Noise dB(A)	CFM	Dim. In./mm
2408PL-04W-B30	12	6-18.8	1.8	150	3100	28	9	2.36 (60)
-B40	12	6-13.8	2.3	190	4200	35	12	All Models
2408PL-05W-B30	24	12-27.6	1.9	80	3100	28	9	
-B40	24	12-27.6	2.9	120	4200	35	12	
2410NL-04W-B10	12	6-13.8	1.0	80	3000	24	12	2.36 (60)
-B20	12	6-13.8	1.1	90	3300	26	13	All Models
-B30	12	6-13.8	1.2	100	4000	29	17	
-B40	12	6-13.8	1.7	140	4600	33	19	
-B50	12	6-13.8	2.5	210	5300	38	23	
2410NL-05W-B10	24	12-27.6	1.0	40	3000	24	12	
-B20	24	12-27.6	1.2	50	3300	26	13	
-B30	24	12-27.6	1.4	60	4000	29	17	
-B40	24	12-27.6	1.9	80	4600	33	19	
-B50	24	12-27.6	2.2	90	5300	38	23	
2410PL-04W-B20	12	6-13.8	1.0	80	2300	25	9	2.36 (60)
-B30	12	6-13.8	1.4	120	3150	30	14	All Models
-B40	12	6-13.8	2.4	200	3900	37	18	
2410PL-05W-B20	24	12-27.6	1.7	70	2200	25	9	
-B30	24	12-27.6	1.9	80	3150	30	14	
-B40	24	12-27.6	2.6	110	3900	37	18	
3110NL-04W-B10	12	6-13.8	0.8	70	1950	20	23	3.15 (80)
-B20	12	6-13.8	1.0	80	2150	23	27	All Models
-B30	12	6-13.8	1.2	100	2450	26	30	
-B40	12	6-13.8	1.8	150	2950	32	35	
-B50	12	6-13.8	2.6	220	3400	36	42	
3110NL-05W-B10	24	10-27.6	1.4	60	1950	21	23	
-B20	24	10-27.6	1.7	70	2150	23	27	
-B30	24	10-27.6	1.9	80	2450	26	30	
-B40	24	10-27.6	2.2	90	2950	32	35	
-B50	24	10-27.6	2.9	120	3400	36	42	
3110PL-04W-B20	12	6-13.8	1.1	90	2250	27	21	3.15 (80)
-B30	12	6-13.8	1.8	150	2900	34	27	All Models
-B40	12	6-13.8	2.5	210	3500	38	32	
3110PL-05W-B20	24	10-27.6	1.9	80	2250	27	21	
-B30	24	10-27.6	2.2	110	2900	34	27	
-B40	24	10-27.6	3.4	140	3500	38	32	
3610NL-04W-B10	12	6-13.8	1.2	100	2000	24	31	3.62 (92)
-B20	12	6-13.8	1.6	130	2300	27	35	All Models
-B30	12	6-13.8	2.2	180	2700	32	42	
-B40	12	6-13.8	3.2	270	3100	36	51	
3610NL-05W-B10	24	10-27.6	1.2	60	2000	24	31	
-B20	24	10-27.6	1.7	70	2300	27	35	
-B30	24	10-27.6	2.4	100	2700	32	42	
-B40	24	10-27.6	3.1	130	3100	36	51	
3610PL-04W-B20	12	7-13.8	1.9	180	2200	33	35	3.62 (92)
-B30	12	7-13.8	3.2	270	2900	39	47	All Models
3610PL-05W-B20	24	10-27.6	2.2	90	2200	33	35	
-B30	24	10-27.6	3.6	150	2900	39	47	
4710PL-04W-B20	12	7-13.8	2.4	200	2000	33	53	4.69 (119)
-B30	12	7-13.8	4.2	350	2700	38	71	All Models
4710PL-05W-B20	24	10-27.6	3.1	130	2000	33	53	
-B30	24	10-27.6	5.3	220	2700	38	71	
4715ML-04W-B10	12	6-13.8	2.4	200	1850	30	65	4.69 (119)
-B30	12	6-13.8	6	500	2800	41	100	All Models
4715ML-05W-B30	24	10-27.6	7.2	300	2800	41	100	
4715PL-04W-B20	12	6-13.8	3.6	300	2500	38	75	4.72 (120)
-B30	12	6-13.8	5.9	540	3000	42	95	All Models
4715PL-05W-B20	24	10-27.6	4.3	210	2500	38	80	
-B30	24	10-27.6	5.9	245	3100	43	95	

AC-SERIES FANS

Model #	Volts	Watts	mAMPS	Speed	Noise dB(A)	CFM	Dim. In./mm
2412PS-12W-B30	115	4	44	3000	29	11	2.36 (60)
3110PS-12W-B30	115	5	76	3100	33	20	3.15 (80)
3115FS-12T-B00	115	4	45	1850	31	18	3.15 (80)
-B10-A00	115	6	87	2100	38	21.5	All Models
-B20	115	7	90	2700	40	27	
-B30	115	8.5	100	3250	44	32	
3115FS-23T-B10	230	.5	50	2050	35	20	
-B20	230	7.5	60	2750	40	28	
-B30	230	8.0	85	3250	44	33	
3115PS-12T-B10	115	4.2	58	2500	25	28	3.15 (80)
-B20	115	4.5	58	2750	31	29	All Models
-B30	115	6.9	100	3300	38	34	
3115PS-23T-B10	230	4.6	44	2550	26	26	
-B20	230	4.7	44	2900	34	29	
-B30	230	6.6	58	3300	38	34	
3610PS-12T-B10	115	5.5	73	2200	25	20	3.62 (92)
-B20	115	6	74	2800	36	28	All Models
-B30	115	9	110	3200	38	35	
3610PS-23T-B10	230	5	43	2300	28	20	
-B20	230	5	44	2600	35	28	
-B30	230	9	68	3200	39	35	
4710PS-12T-B20	115	8	90	2300	30	57	4.59 (119)
-B30	115	11	136	3100	38	77	All Models
4710PS-23T-B20	230	7	34	2200	30	56	
-B30	230	10	68	2900	38	75	
4715FS-12T-B00	115	9	97	1950	40	80	4.72 (120)
-B10	115	9.5	110	2200	41	70	All Models
-B20	115	10	120	2350	42.6	80	
-B30	115	14.5	180	2650	53.5	90	
-B40	115	15	195	3000	55	100	
-B50	115	17	205	3300	58	110	
4715FS-23T-B00	230	8	45	1950	40	60	
-B10	230	10	55	2200	41	70	
-B20	230	8	65	2350	42.6	80	
-B30	230	10.5	90	2650	53.5	90	
-B40	230	13	100	3000	55	100	
-B50	230	14	110	3300	56	110	
4715MS-12T-B10	115	5.5	80	1450	28	49	4.72 (120)
-B20	115	7.0	100	1950	30	67	All Models
-B30	115	10.0	140	2600	37	88	
-B40	115	13.0	190	2750	39	95	
-B50	115	13.0	210	2900	41	102	
4715MS-23T-B10	230	6.0	45	1450	28	49	
-B20	230	7.5	60	1950	30	87	
-B30	230	11.0	80	2600	37	88	
-B40	230	13.0	100	2750	39	95	
-B50	230	14.0	100	2900	41	102	
4715PS-12T-B10	115	6.5	82	1950	28	65	4.72 (120)
-B20	115	10	129	2900	43	98	All Models
-B30	115	14	180	3200	46	106	
4715PS-23T-B10	230	6.5	33	1720	26	58	
-B20	230	10	61	2900	43	97	
-B30	230	13	93	3200	46	106	
5915PC-12T-B10	115	18	190	1650	38	102	6.77 (172)
-B20	115	22	210	2600	50	170	All Models
-B30	115	32	360	3200	58	212	
5915PC-23T-B10	230	18	110	1650	36	102	
-B20	230	26	140	2600	50	170	
-B30	230	35	180	3200	56	212	



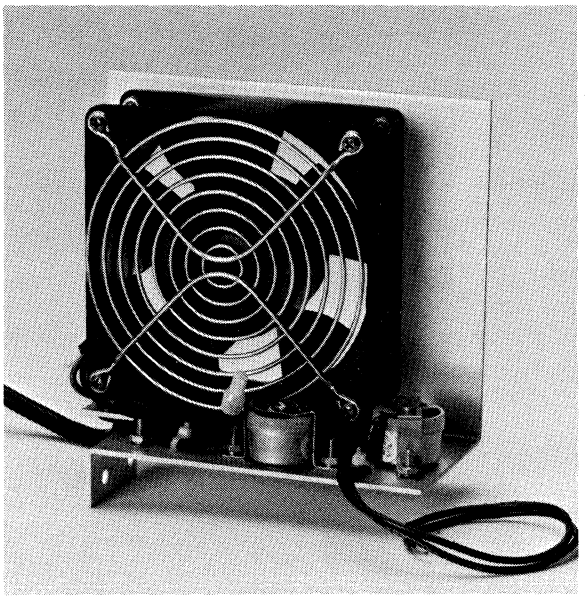
MECHATRONICS
2835-82nd Ave. S.E.
P.O. Box 20
Mercer Island, WA 98040
206-232-4800
910-444-4126 TWX#
206-236-5480 FAX#

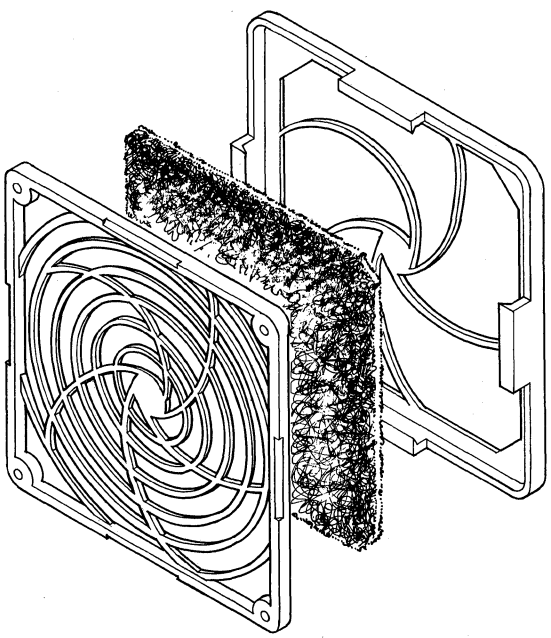
800-453-4569

MECHATRONICS

SPECIAL CUSTOMER DESIGNED ASSEMBLIES (VALUE ADDED)

- Wire Harnesses and Connectors
- Custom fabricated sheet metal parts
- Fans assembled with finger guards
- Customer specified component assemblies
- Power cord sub assemblies





FILTER ASSEMBLIES

Basic Model #	Fan O.D.	Media Porosity
09325	3.1 in./80mm	30 thru 100 PP
09362	3.6 in./92mm	30 thru 100 PP
09450	4.7 in./120mm	30 thru 100 PP

Retainer and guard UL 94 VO material
Media easily cleaned

MECHATRONICS
2835-82nd Ave. S.E.
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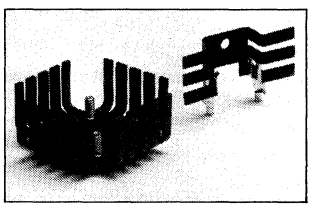
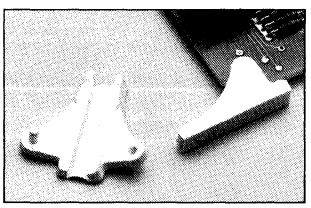
Thermalloy Inc.

The Innovator in semiconductor accessories.



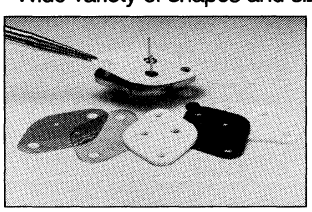
Heat Sinks

- Labor saving.
- Wave solderable using solderable studs, solderable nuts or solderable mounting tabs.
- Vertical and horizontal mount.
- Wide variety of shapes and sizes.



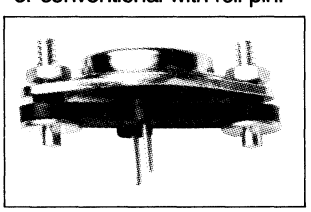
Card Guides, Ejectors and Pullers

- Variety of sizes and shapes.
- A choice of labor saving press-fit card guides or hardware mounted for secure mounting.
- Ejectors and pullers available in one piece snap-on or conventional with roll pin.



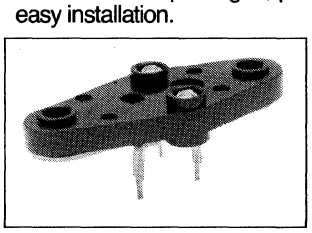
Insulators

- Mica
- Thermalfilm™ (polyimide plastic film)
- Thermalsil™ (silicone rubber)
- Hard Anodized Aluminum
- Aluminum Oxide
- Beryllium Oxide
- Insul-Cote™ — packaged, pre-coated insulators for easy installation.



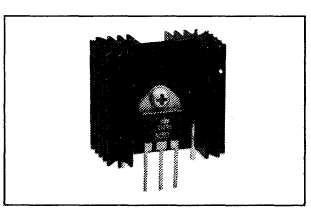
Solderable Transistor Mounts

- Cuts assembly steps by 50%.
- Eliminates hand soldering.
- Tin plated posts offer excellent solderability for mechanical and electrical integrity.
- All work is done from one side of board.
- Reduces hardware requirements.
- Elevates device for cleaning.



Power Sockets

- Tin plated.
- For TO-3 case styles.
- Inexpensive laminated power sockets also available.
- Metric and English mounting plate threads.
- Available with complete mounting kits.



Extruded Heat Sinks

- Over 250 standard, tooled shapes immediately available.
- Custom design — call on our engineers for your custom design needs.

Offering the widest variety of semiconductor accessories in the industry. For a free catalog, contact your nearest Thermalloy representative or distributor.

Thermalloy Inc.

The Innovator in semiconductor accessories.

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Dallas, Texas 75381-0839 • TEL: 214-243-4321 Ext. 99
TLX: 203965 • FAX: 214-241-4656

AIR CONDITIONERS

Temperature Control...

Solid State Cooling For Electronic Enclosures

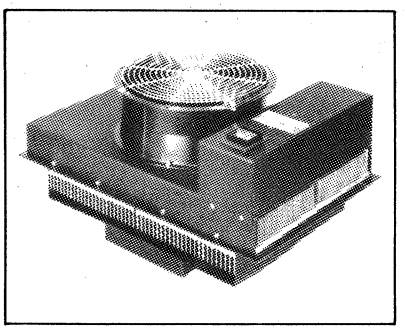
Thermoelectric Air Conditioners are a solid state method of refrigeration, which eliminates the need for a compressor, refrigerant fluids or piping. The only moving parts are highly reliable fans used to dissipate output heat to the ambient air. These air conditioners can be applied in computers, machine tool controls, instrumentation & electronics for hostile environment protection. They offer design flexibility in a wide range of industrial and consumer applications where compactness and reliability are key.

Features:

- *No load cooling to −5°F (−20°C) at room temperature*
- *Lightweight, compact designs*
- *No compressor, no fluids, no coils*
- *Closed system protection from dust, chips, & moisture*
- *No moving parts except fans, means high reliability*
- *Low vibration, noise & maintenance*
- *Metal finishes resist corrosion*
- *Operates in any orientation - horizontal, vertical, etc.*
- *All models available from stock*

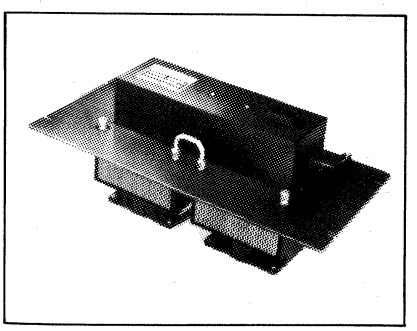
Other Products:

- Liquid cooled air conditioners rated to 1500 BTU/HR
- Thermoelectric cooling modules
- Temperature controllers
- Standard DC power supplies
- Solid State Liquid Chillers



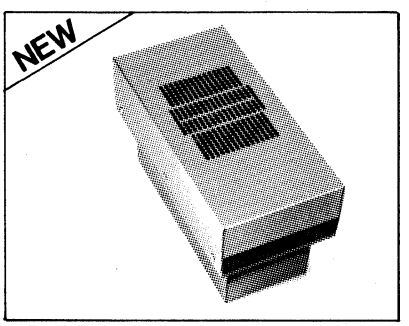
AHP-1700

Air Cooled
1100 BTUH Cooling
19″ Rack Mount
Input: 115 VAC
NEMA 12



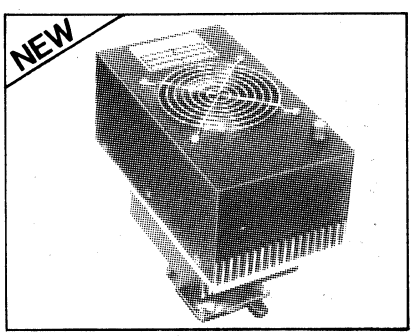
LHP-1700

Liquid Cooled
1500 BTUH Cooling
Input: 115 VAC
Adaptable to Explosion Proof Applications
NEMA 12



AHP-1200X

Industrially Hardened NEMA 4X
Withstands corrosion, shock and vibration
600 BTU/HR Cooling
Input: 115 VAC
Max. Ambient 80°C
Gasket and Mounting Hardware Included

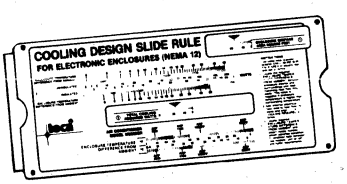


AHP-301

Air Cooled
Compact
Input: 115/230 VAC
200 BTU/HR Cooling
Gasket and Mounting Hardware Included
"Our Smallest Air Conditioner Designed for AC Input"

One Year Warranty on Parts and Labor
24 Hour Shipment on Most In-Stock Items

Ask for our Free Cooling Design Slide Rule



teca™ ***the experts in solid state cooling*** **(312) 666-1600**

All Products Made in U.S.A.

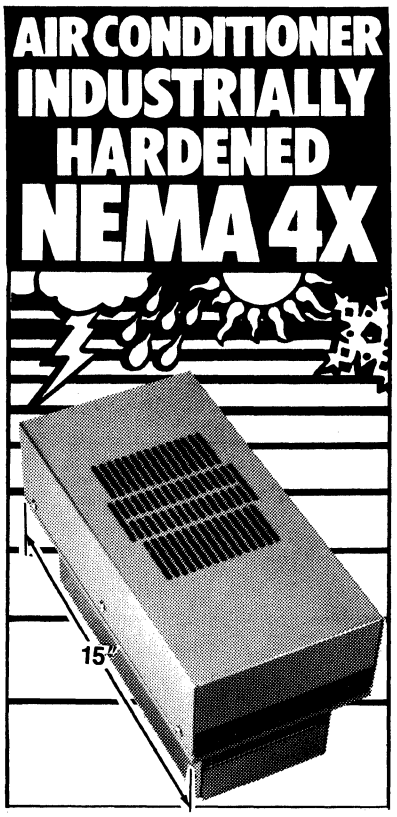
ThermoElectric Cooling America Corporation
448 North Halsted Street • Chicago, Illinois 60622 • 312/666-1600 • FAX: 312/666-3964

New Cooling Products...

Designed and Built for NEMA 12, 13 & 4X

Designed and built for effective, dependable cooling in NEMA 12 applications where size limitation is a problem. It contains no compressor, refrigerant, or piping; the highly reliable fans are its only moving parts.

- For computers, machine tools, electronics, instrumentation
- No load cooling to −5°C at room temperature; 1100 BTU/HR
- Closed system protects from dust, metal chips, moisture
- Operates in any position—horizontal, vertical, etc.
- Low vibration and noise; minimal maintenance
- Weighs less than 50 pounds; mounts on standard 19″ rack
- Requires only 110 VAC, 6 amp power



AHP-1200X

SOLID STATE AIR CONDITIONER PROVIDES TOTAL PROTECTION FROM HEAT BUILD-UP IN ELECTRONIC ENCLOSURES

AHP-1200X is the most rugged fractional ton air conditioner for electronic enclosure cooling. Ideal in NEMA-4X environments. Withstands high temperature and humidity, harsh factory environments, shock and vibration. Weather resistant from corrosive salt, water and ice. Entirely sealed and gasketed. Anodized aluminum cabinet is lightweight and durable. Highly reliable fans are the only moving parts. The AHP-1200X thrives in temperatures of −20°F to +175°F.

- Nominal heat removal 500 BTUH. (Enclosure air temperature equal to ambient)
- Requires only 115 VAC, 2.5 amp
- No fluorocarbons, compressor, or piping
- Compact—Only 15.0" x7.4"x8.0"
- No moving parts except fans (Military grade (MIL-901) fan on exterior side)
- Unloaded enclosure air cooling to 60°F below ambient
- Neoprene gasket included for pressurized seal

AHP-301FF

Solid State Air Conditioner

Dependable Cooling To Prevent Overheating

Built to provide powerful, reliable cooling for computers, instrumentation and sensitive electronic systems. Electronics will stay cool and clean, free from dust, dirt and moisture. Maintains efficient operating temperatures and clean air within the electronic enclosure.

- **Requires 115 VAC or 230 VAC, 50/60 Hz**
- Nominal heat removal 200 BTUH.
- Compact - Only 10.0″x5.63″x8.47″
- No moving parts except highly reliable fans
- Mounting hardware included
- Gasket for dust tight seal included
- Operates in any orientation – horizontal, vertical, etc.

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eem SI UNITS

RELATIVE QUANTITY SYMBOLS

$\neq$	not equal to
$\approx$	approximately equal to
$\propto$	proportional to
$<$	smaller than
$\leq$	smaller than or equal to
$\ll$	much smaller than
$>$	larger than
$\geq$	larger than or equal to
$\gg$	much larger than
$\equiv$	identical to or equivalent
$\uparrow$	increases
$\downarrow$	decreases

PREFIXES FOR SI UNITS

Multiple	Prefix	Symbol
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p

Quantity	Symbol	SI Unit	Symbol	Derivation
acceleration	a	m s^{-2}	—	velocity/time
acceleration due to gravity	g	m s^{-2}	—	velocity/time
amount of substance	n	mole	mol	mole fraction (n) used
amplification factor	μ	*a ratio*	—	—
angle	$\theta_1, \varphi_1, \alpha_1$	—	—	—
angle of incidence	i	degree or radian	°	—
angle of refraction	r	degree or radian	°	—
angle, Bragg	θ	number	—	—
angle, critical	c	degree or radian	°	—
anode slope resistance	R_A	ohm	Ω	$\Delta V_a / \Delta I_a$
area	A	metres squared	m^2	$l \times b$
atomic number	Z	a number	—	number of protons
Avogadro constant	L, N_A	number	—	—
breadth	b	metre	m	fundamental unit
capacitance	C	farad	F	charge/p.d.
charge, electric	Q	coulomb	C	current × time
charge on electron	e	coulomb	C	$1{\cdot}6 \times 10^{-19}$ C
conductance	G	ohm^{-1}	Ω^{-1}	reciprocal of resistance
current, electric	I	ampere	A	fundamental unit
decay constant	λ	*a ratio*	—	—
density	ρ	kg m^{-3}	—	m/V
distance along path	s	metre	m	fundamental unit
efficiency	η	*a ratio*	—	work output/work input
electrochemical equiv.	z	g C^{-1}	—	mass/charge
electromotive force	E	volt	V	energy/charge
electron	e	—	—	—
energy	E	joule	J	N m
energy, kinetic	E_k	joule	J	N m. $E_k = 1/2mv^2$
energy, potential	E_p	joule	J	N m. $E_p = mgh$
Faraday constant	F	coulomb mol^{-1}	C mol^{-1}	96,500 C mol^{-1}
field strength, electric	E	V m^{-1}	—	potential gradient: p.d./dist.
field-strength magnetic	H	ampere-turns	—	current × no. of turns
flux, magnetic	Φ	weber	Wb	e.m.f/rate of change of flux
flux density	B	tesla	T	flux/area
focal length	f	metre	m	—
force	F	newton	N	kg m s^{-2}
free energy	ΔG	joule	J	—
frequency	f	hertz	Hz	oscillations/time
gas constant	r	joule	J	energy
half-life,radioactivity	$t_{1/2}$	second	s	fundamental unit
heat capacity	C	J K^{-1}	—	quantity of heat/temp. rise
heat of reaction	ΔH	joule	J	heat energy
heat capacity, specific	c	J K^{-1} kg^{-1}	—	heat capacity/mass
heat, quantity of	q	joule	J	energy

SI UNITS

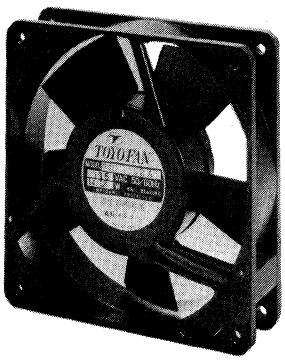
Quantity	Symbol	SI Unit	Symbol	Derivation
height	h	metre	m	fundamental unit
image distance	υ	metre	m	fundamental unit
inductance, mutual	M	henry	H	induced e.m.f./rate of change of current
inductance, self	L	henry	H	—
intensity of radiation	I	*a number*	—	—
latent heat	L	joule	J	quantity of heat
latent heat, specific	l	J kg^{-1}	—	quantity of heat
latent heat, molar	L_m	joule mol^{-1}	J	quantity of heat
length	l	metre	m	fundamental unit
magnetizing force	H	ampere-turns	—	—
magnetic moment	m	Wb m	—	torque in unit magnetic field
magnification, linear	m	*a ratio*	—	—
mass	m	kilogramme	kg	fundamental unit
mass number	A	*a number*	—	number of neutrons + protons
molar volume	V_m	(dm^3)	—	volume of 1 mole
molar solution	M	*a ratio*	—	moles/dm^3
moment of force	—	N m	—	force × perp. distance
neutron number	N	*a number*	—	number of neutrons
number	n	—	—	—
number of molecules	N	—	—	—
number turns on coil	n	*a number*	—	—
number order spectrum	p	*a number*	—	—
object distance	u	metre	m	fundamental unit
peak current	I_o	ampere	A	see current
peak e.m.f.	E_o	volt	V	see e.m.f.
period	T	second	s	fundamental unit
permeability	μ	H m^{-1}	—	henry/metre
permeability, vacuum	μ_o	H m^{-1}	—	—
permeability, relative	μ_r	*a ratio*	—	$\mu = \frac{\mu}{\mu_o}$
permittivity	ε	F m^{-1}	—	farad/metre
permittivity, vacuum	ε_o	F m^{-1}	—	farad/metre
permittivity, relative	ε_r	*a ratio*	—	$\varepsilon_r = \frac{\varepsilon}{\varepsilon_o}$
potential, electric	V	volt	V	energy/charge
potential difference	V	volt	V	energy/charge
power	P	watt	W	J s^{-1}
pressure	p	pascal	Pa	N m^{-2}: force/area
radius	r	metre	m	fundamental unit
reactance	X	ohm	Ω	E_o/I_o
refractive index	n	*a ratio*	—	—
resistance	R	ohm	Ω	p.d./current
resistivity, electrical	ρ	ohm-metre	—	resistance × length
relative density	d	*a ratio*	—	ρ_{sub}/ρ_{water}
r.m.s. current	$I_{r.m.s}$	ampere	A	see current
r.m.s. voltage	$V_{r.m.s}$	volt	V	see e.m.f.
slit separation	s	metre	m	fundamental unit
tension	T	newton	N	see force
temperature, Celsius	θ	degree C	°C	from kelvin
temp. interval	θ	degree	° or K	—
temp. absolute	T	kelvin	K	fundamental unit
thickness	d	metre	m	fundamental unit
time	t	second	s	fundamental unit
torque	T	Nm	—	see moment
turns ratio	T	*a ratio*	—	n_{sec}/n_{prim}
(unit of electricity)	—	kW h	—	kilowatt × hour
velocity	u,υ	ms^{-1}	—	distance/time
velocity, angular	ω	$second^{-1}$	s^{-1}	angle/time
velocity, e.m.waves	c	m s^{-1}	—	—
velocity of sound	υ	m s^{-1}	—	—
volume	V	metre cubed	m^3	l × b × h
wavelength	λ	metre	m	fundamental unit
work	w	joule	J	force x distance (Nm)
weight	W	newton	N	kg m s^{-2}or mg

U.S. TOYO FAN CORPORATION

4915 Walnut Grove Avenue
San Gabriel, California 91776
(818) 287-5297
TWX (910) 589-1540
FAX (818) 287-7350

TF120 Series - AC

4.70″ (120mm) sq. × 1.50″ (38mm) thk.
× .98″ (25mm) thk.
× .79″ (20mm) thk.



FEATURES:

- Choice of three thicknesses.
- Choice of airflow — 57 to 109 CFM.
- Acoustical noise level as low as 35 dB(A) @ 1m.
- Choice of standard voltages, plus 100, 200 & dual VAC.
- Choice of terminals or wire leads.
- Precision ball bearings.
- Durable die cast aluminum frame.
- Impedance protected.
- U.L. & CSA approved.

TF92 Series - AC

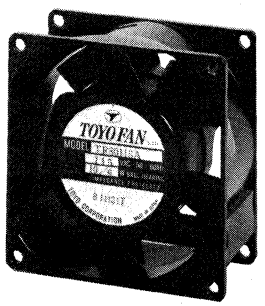
3.62″ (92mm) sq. × .98″ (25mm) thk.
× .79″ (20mm) thk.

FEATURES:

- Choice of two thicknesses.
- Choice of airflow — 27 to 34 CFM.
- Acoustical noise level as low as 36 dB(A) @ 1m.
- Choice of standard voltages, plus 100, 200 & dual VAC.
- Choice of terminals or lead wires.
- Precision ball bearings.
- Durable die cast aluminum frame.
- Impedance protected.
- U.L. & CSA approved.

TF80 Series - AC

3.15″ (80mm) sq. × 1.50″ (38mm) thk.
× .98″ (25mm) thk.
× .79″ (20mm) thk.



FEATURES:

- Choice of three thicknesses.
- Choice of airflow — 16 to 32 CFM.
- Acoustical noise level as low as 32 dB(A) @ 1m.
- Choice of standard voltages, plus 100, 200 & dual VAC.
- Choice of terminals or lead wires.
- Precision ball bearings.
- Durable die cast aluminum frame.
- Impedance protected.
- U.L. & CSA approved.

ECONOMY LINE — SLEEVE & BALL BEARING

SERIES

UST120 — AC (4.70″ sq. × 1.5″ thk.)
UST92 — AC (3.62″ sq. × 1.0″ thk.)
UST80 — AC (3.15″ sq. × 1.5″ thk.)
(3.15″ sq. × 1.0″ thk.)

FEATURES:

- Low cost.
- Choice of airflow — 15 to 105 CFM.
- Acoustical noise level as low as —
  38 dB(A) @ 1m for UST120
  35 dB(A) @ 1m for UST92
  29 dB(A) @ 1m for UST80
- Choice of standard voltages.
- Choice of terminals or lead wires.
- Choice of sleeve or ball bearings.
- Durable die cast aluminum frames.
- Impedance protected.
- U.L. & CSA approved.

TFDD120 Series
DC BRUSHLESS

4.70″ (120mm) sq. × 1.50″ (38mm) thk.
× .98″ (25mm) thk.

FEATURES:

- Choice of two thicknesses.
- Choice of airflow — 53 to 106 CFM.
- Acoustical noise level as low as 39 dB(A) @ 1m.
- Choice of 12, 24 & 48 VDC.
- All precision ball bearings.
- Solid state design.
- Low power draw.
- Minimum EMI/RFI emission.
- Impedance & polarity protected.
- U.L. & CSA approved.
- Available with failure sensor.

TFDD92 Series
DC BRUSHLESS

3.62″ (92mm) sq. × .98″ (25mm) thk.

FEATURES:

- Choice of airflow — 36 to 49 CFM.
- Acoustical noise level as low as 28 dB(A) @ 1m.
- Choice of 12 & 24 VDC.
- All precision ball bearings.
- Solid state design.
- Low power draw.
- Minimum EMI/RFI emission.
- Impedance & polarity protected.
- U.L. & CSA approved.

U.S. TOYO FAN CORPORATION

4915 Walnut Grove Avenue
San Gabriel, California 91776
(818) 287-5297
TWX (910) 589-1540
FAX (818) 287-7350

TFDD80 Series
DC BRUSHLESS
3.15″ (80mm) sq. × .90″ (23mm) thk.

FEATURES:
- Choice of airflow — 26 to 33 CFM.
- Acoustical noise level as low as 30 dB(A) @ 1m.
- Choice of 12 & 24 VDC.
- Precision ball bearings.
- Solid state design.
- Low power draw.
- Minimum EMI/RFI emission.
- Impedance & polarity protected.
- U.L. & CSA approved.
- Available with failure sensor.

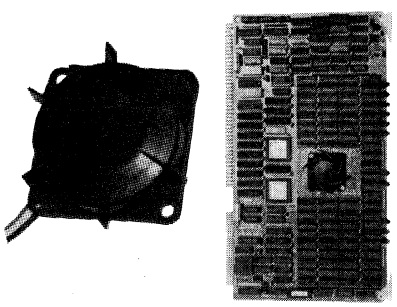
USTD80 Series
DC BRUSHLESS
Low Cost — High Quality
3.62″ (80mm) sq. × .98″ (25mm) thk.

FEATURES:
- Low cost — high quality.
- Choice of airflow — 21 to 35 CFM.
- Acoustical noise level as low as 27 dB(A) @ 1m.
- Choice of 12 & 24 VDC.
- Precision ball bearings.
- Solid state design.
- Low power draw.
- Minimun EMI/RFI emission.
- Impedance & polarity protected.

TFDD60 Series
DC BRUSHLESS
2.36″ (60mm) sq. × .90″ (23mm) thk.

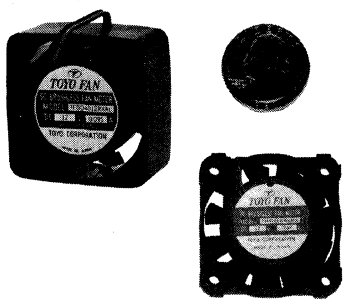
FEATURES:
- Compact size.
- Choice of airflow — 13 to 18 CFM.
- Acoustical noise level as low as 25 dB(A) @ 1m.
- Choice of 5, 12 & 24 VDC.
- Precision ball bearings.
- Solid state design.
- Low power draw.
- Minimum EMI/RFI emission.
- Impedance & polarity protected.

TFDD50BM Series
DC BRUSHLESS
PC Board Mountable Fan
1.85″ (47mm) sq. × .47″ (12mm) thk.



FEATURES:
- PC board mounting design.
- Miniature size.
- Contains failure sensor.
- Choice of airflow — 2.6 to 4.2 CFM.
- Acoustical noise level as low as 26.5 db(A) @ 1m.
- Choice of 5, 12 & 24 VDC.
- Solid state design.
- Low power draw.
- Minimum EMI/RFI emission.
- Impedance & polarity protected.

TFDD40 & 41 Series
DC BRUSHLESS
Ultra Miniature Fan
1.50″ (40mm) sq. × .70″ (20mm) thk.
× .39″ (10mm) thk.



FEATURES:
- Ultra miniature size.
- Choice of two thicknesses.
- Choice of airflow — 4.6 to 6 CFM.
- Acoustical noise level as low as 28 dB(A) @ 1m.
- Choice of 5, 12 & 24 VDC (TFDD40).
- Precision ball bearings.
- Solid state design.
- Low power draw.
- Minimum EMI/RFI emission.
- TFDD40 Series U.L. & CSA approved.

WARRANTY
All U.S. Toyo fans are warranted to be free of defects in materials and workmanship for a period of one year from date of delivery.

AIRFLOW PERFORMANCE DATA
Performance data obtained with test chamber and methods in accordance with AMCA Standard 210-74.

ACOUSTICAL NOISE DATA
Acoustical measurements made at distances of 1.0 and 1.5 meters from fan intake. All measurements made on dB (A) scale. Fans operating at 60Hz line frequency.

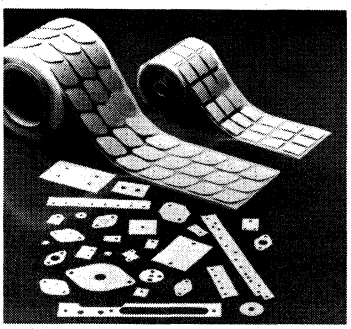
OPERATING TEMPERATURE
Recommended ambient operating temperature is −30°C to +70°C.

IMPEDANCE PROTECTION
All fans are designed and manufactured to prevent "burn-out" failure caused by restriction of rotating parts.

LIFE EXPECTANCY
Life test data available on request.

SAFETY
All fans are designed and manufactured to meet UL and CSA standards. UL and CSA File Nos. available on request for approved fans.

Sil-Pad® Thermally Conductive Insulators



WHAT ARE SIL-PAD INSULTORS?

Sil-Pad brand thermally conductive insulators are greaseless, silicone-based insulators typically mounted between a transistor and a heat sink. Sil-Pads offer low resistance to heat transfer while providing electrical isolation between the parts of an assembly.

Sil-Pads are constructed of soft silicone rubber compounded with compatible, thermally conductive fillers which provide thermal transfer capabilities. These compounds are combined with woven fiber or film substrates to provide a tough insulator able to withstand the mechanical rigors of assembly. Sil-Pads are thermally stable and compounded to eliminate flammability.

WHY USE SIL-PADS?

Bergquist is the leader in the development of thermally conductive insulating products. Sil-Pads eliminate the use of messy grease and brittle mica or ceramics in the assembly area. They save significant labor expense compared to grease and mica while providing excellent thermal resistance. Sil-Pads are also more dependable than brittle ceramics and mica which can crack or fracture. Another advantage of Sil-Pads is the variety of shapes they can be produced in, from standard punched parts to sheets or specially designed shapes. Regardless of your thermal or dielectric requirements there is a Sil-Pad to fit your application.

SIL-PAD 400®

Sil-Pad 400 is a composite of alumina oxide loaded silicone rubber and fiberglass. It is an ideal replacement for mica and grease. Sil-Pad 400 can range in thickness from .007 inches to .045 inches. The dielectric strength is 550 volts per mil. Thermal resistance for a TO-3 transistor is .5 °C/Watt for .009 inch material and .4 °C/Watt for .007 inch material.

SIL-PAD 1000®

Sil-Pad 1000 is made of boron nitride filled silicone rubber and fiberglass. It is ideal for applications requiring higher levels of heat transfer than Sil-Pad 400. It has lower thermal resistance and is used in applications where surface irregularities require a thicker pad with higher levels of heat transfer. Thickness of Sil-Pad 1000 is .009 inches. The dielectric strength is 550 volts per mil. Thermal resistance for a TO-3 style transistor is .3 °C/Watt.

SIL-PAD 2000®

Sil-Pad 2000 is Bergquist's high performance, high reliability thermally conductive insulator. Sil-Pad 2000 is designed for demanding military/aerospace and commercial applications and complies with Mil-I-49456, type 1, class 1, the specification governing fiberglass reinforced elastomeric sheet insulation material. With a thickness of .015", Sil-Pad 2000 has a breakdown voltage of 4000 volts and thermal resistance of 0.2 °C/Watt. Sil-Pad 2000 is also available in a variety of thicknesses.

SIL-PAD K-4®

Sil-Pad K-4 is one of the thermally conductive Kapton® MT based Sil-Pads designed to provide more physical strength and better thermal performance. Kapton polyimide film is a high dielectric, thin, durable material which is less susceptible to burr cut-through or crushing. K-4 is also an ideal replacement for mica and grease, with the added advantages of Kapton. K-4 has enhanced dielectric properties over the Sil-Pad 400. Dielectric strength is 5000 volts. Thermal resistance for a TO-3 style transistor is .4 °C/Watt. Thickness is .006 ± .001 inches.

SIL-PAD K-10®

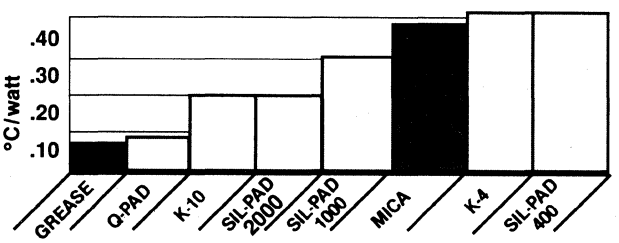
Sil-pad K-10 is the new high performance insulator developed in conjunction with DuPont for critical heat applications. K-10 is made of boron nitride filled silicone rubber and Kapton MT polyimide film. K-10 is the ideal replacement for ceramic materials.such as beryllium oxide and alumina. Sil-Pad K-10 has the lowest thermal resistance of any insulation material available on the market.

K-10 has a thickness of .006 ± .001 inches. The dielectric strength is 5000 volts. Thermal resistance for a TO-3 style transistor is .2°C/Watt.

Q-PAD II®

Q-Pad II is the new thermally conductive material for "grease only" applications. It is designed for those applications where maximum heat transfer is needed and electrical insulation is not required. Q-Pad II is the ideal thermal interface material to replace messy thermal grease compounds. Thickness is .006 inches. Thermal resistance for a TO-3 style insulator is .1 °C/Watt.

THERMAL RESISTANCE (TO-3 Configuration)



SIL-PAD SHIELD

Berguist Sil-Pad shield is a bonded laminate of thermally conductive, electrically isolating Sil-Pad 400 or Sil-Pad 1000 pads with a copper shield between the layers. Sil-Pad shield is typically used under switching power transistors. It is designed to reduce heat sink "noise" and to lower capacitance and EMI, RFI problems at the component level. Special configurations can also be produced. Total thickness is .019 ± .002 inches. Approximate thermal resistance for a TO-3 style is .85 to 1.0 °C/Watt. Shielding effectiveness, 50db or higher.

SPECIAL SHAPES: We produce thousands of specials. Tooling charges are about $100 to $150 for simple parts. Increased complexity or tighter tolerances increase tooling charges.

ADHESIVE: Most materials are available with adhesive on one or both sides.

TOLERANCES: .015 inches are held on width, length and hole location. Contact the factory if tighter tolerances are required.

CUSTOM MATERIALS: Other special materials such as laminates, coatings, etc. are also available.

SHEETS: 6" x 6", 6" x 12", 8" x 8", 10" x 10", or 12" x 12" sheets are available from stock, with or without adhesive.

ROLLS: All Sil-Pad materials are available in roll form, with or without adhesive. Contact the factory.

Mil spec.	Mil-M-38527/8A	Mil-M-87111
	Mil-M-38527C	U.L. FILE NUMBER E59150
	Mil-I-49456	FSCM NUMBER 55285

For a free copy of the Sil-Pad Design Guide, Contact: The Bergquist Company. ***Call Toll Free: 1-800-328-3882***

BERGQUIST

5300 Edina Industrial Blvd.
Minneapolis, MN 55435
Phone: (612) 835-2322
FAX; (612) 835-4156

CUT CRAFT, INC.

CUSTOM DIE CUT COMPONENTS FOR THE ELECTRONICS INDUSTRY

REDUCE MATERIAL COSTS • REDUCE ASSEMBLY TIME
SOLVE DESIGN PROBLEMS

INSULATORS • GASKETS • SHIELDING

Materials Include:

- ☐ Bergquist Sil-Pad®
- ☐ Chomerics Cho-Therm®
- ☐ Dupont Kapton®
- ☐ Dupont Nomex®
- ☐ Dupont Mylar® Polyester
- ☐ Fishpaper
- ☐ Foams-Neoprene, PVC, Urethane, Polyethylene
- ☐ General Electric Lexan® (FR-60)
- ☐ General Electric Ultem®
- ☐ General Electric Valox®
- ☐ G10/FR4 Epoxy Fiberglass
- ☐ ITW Fastex FRPP-301 Polypropylene
- ☐ Lydall S-350
- ☐ Lydall Duroid D-100 FR/D-225 FR/ D-800 FR
- ☐ Lydall Voltex
- ☐ Rigid PVC
- ☐ Windsor-Stevens FRP
- ☐ 3M Laminating Adhesives

Options:

- ☐ Die Cut/Sheared
- ☐ Scored/Punched/Formed
- ☐ Perforated/Creased/Folded
- ☐ Printed
- ☐ Laminated—Full or Selective Coverage
- ☐ Pressure Sensitive Adhesive Coated

RFI Shielding:

The above materials laminated with copper or aluminum foil.

EMI Shielding:

The above materials laminated with nickel foil, or iron foil.

ALL PARTS MADE WITH UL® RECOGNIZED MATERIALS
CERTIFICATE OF CONFORMANCE PROVIDED UPON REQUEST

ALL INQUIRIES INVITED - 5 TO 15 DAY DELIVERY

REQUEST OUR FREE MONTHLY PRODUCT BULLETIN AND
RECEIVE ACTUAL SAMPLE MATERIALS WITH OUTLINES ON
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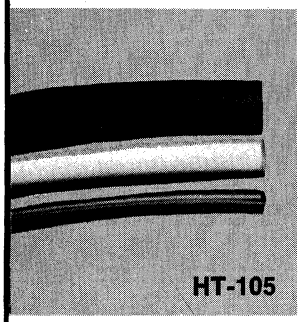
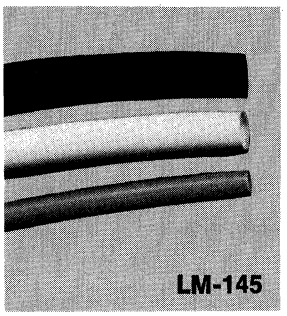
Markel CORPORATION

FLEXITE SHRINKDOWN



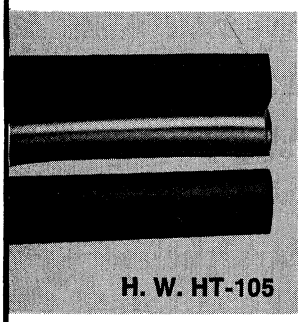
FLEXIBLE PVC SHRINK TUBING

- Outstanding dielectric and mechanical properties.
- Oil and chemical resistant.
- Shrink temperature 150°C.
- Covering and insulating cables, components and terminals.
- Standard colors—black, white and clear.



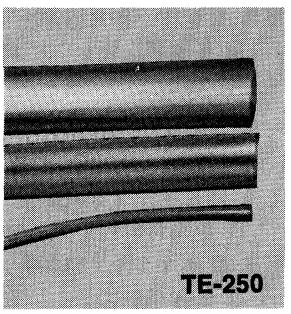
VERY FLEXIBLE POLYOLEFIN SHRINK TUBING

- Maximum flexibility and high dielectric strength.
- Shrink temperature 150°C.
- Available in both flame retardant and non flame retardant classes.
- Standard colors—black, white and clear.



HEAVY WALL PVC SHRINK TUBING

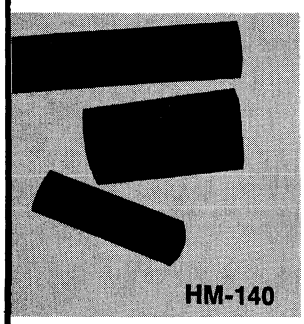
- Maximum abrasion resistance and high dielectric strength.
- Shrink temperature 150°C.
- Standard colors—black, and clear.



TEFLON™* (POLYTETRAFLUOROETHYLENE) SHRINK TUBING

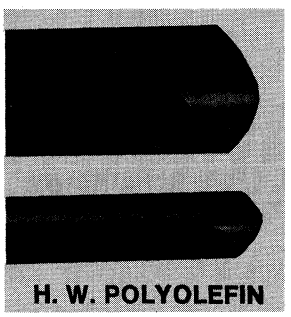
- Used in extreme electrical, thermal and chemical environments.
- Shrink temperature 350°C.
- Available in thin, standard and extra thin walls.
- Standard color natural.

*** DUPONT REG. TRADEMARK**



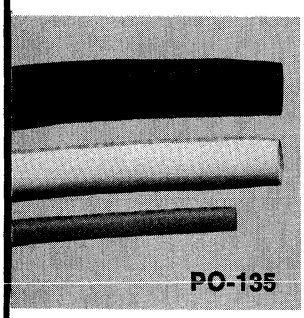
SEMI-RIGID POLYOLEFIN SHRINK TUBING

- Excellent mechanical strength/abrasion resistance.
- Shrink temperature 200°C.
- Resistant to flexing, acids, alkalis and hydraulic fluids.
- Available on spools or cut pieces for use on automatic termination machines.
- Standard colors—black, and clear.



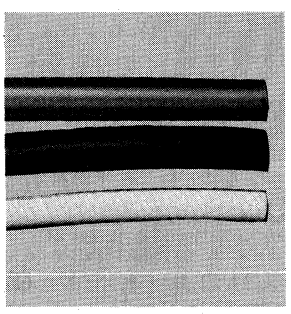
HEAVY WALL POLYOLEFIN SHRINK TUBING WITH AN ADHESIVE LINER

- Insulates and encapsulates to form a weather-proof seal.
- Shrink temperature 200°C.
- Used on connections exposed to the elements.
- Standard color—black.



FLEXIBLE POLYOLEFIN SHRINK TUBING

- Tough, smooth, oil and chemical resistant.
- Available in a variety of flame retardant grades.
- Shrink temperature 200°C.
- Excellent for use over irregular shapes.
- Standard colors—black, white and clear.



Markel also manufactures a variety of other flexible and semi-rigid heat shrink tubings to be used in various abrasion resistant and strain relief applications. These and all of our shrink tubings can be made in various shrink ratios and colors. Contact us the next time you have a special requirement or difficult application.

Markel CORPORATION

P.O. BOX 752
NORRISTOWN, PA 19404
TEL. (215) 272-8960
TWX: 510-660-0929
FAX: (215) 270-3138

POWER DEVICES, INC.
Thermal Interface Products Group
27071 Cabot Road, Bldg. 114
Laguna Hills, CA 92653

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THE CLEAN, EFFICIENT WAY TO IMPROVE THERMAL CONDUCTIVITY

Thermal Interface Pads

Best Available Case-to-Sink Heat Transfer

POWER DEVICES' THERMAL INTERFACE SYSTEMS - A new, "systems approach" to thermal interfacing

Thermal interface pads from Power Devices utilize a systems design approach that can help engineers maximize the transfer of heat from heat dissipating components while eliminating production bottlenecks and manufacturing problems.

Simply place the pad between the component and its mounting surface and tighten. That's all there is to it - no gloves, tools, special handling, measuring, nor time-consuming clean-up required!

Two Component System - Single-Component Convenience

Each pad has a half-mil thick coating of dry-to-the-touch thermal compound applied to both sides of an application-specific substrate which is then die-cut to conform precisely to the device being mounted.

The proprietary thermal compound eliminates damaging air gaps or voids between the surfaces and the substrate speeds heat transfer, while also acting as a medium, or carrier, for the compound.

Unique Change-of-State Thermal Compound

The silicon-free, non-contaminating thermal compound, dry and solid at room temperature, conformally sets to each mating surface under mounting pressure.

As the temperature increases, its "change-of-state" wetting action allows the compound to fill all voids while its natural capillary attraction to the mating surfaces' interface perimeter prevents migration problems which are common with other thermal compounds.

Substrate Materials To Match the Application

When electrical isolation of the component is required, select ISOSTRATE(TM) thermally conductive electrical insulators with Du Pont Kapton® Type MT polymide substrates.

When electrical isolation is not required, use Type 1100 aluminum alloy substrate THERMSTRATE® Interface Pads.

In Summary

All Power Devices thermal interfaces are dry, easily handled, die-cut pads and so easy to use that installation involves nothing more than placing them in position!

And both electrically insulating and non-insulating Power Devices' thermal interface pads provide unequaled contact thermal resistance for the very best case-to-sink heat transfer available!

Immediate Availability

Both ISOSTRATE and THERMSTRATE are available from factory inventory in a wide variety of standard configurations. Call, FAX, or write Power Devices, today.

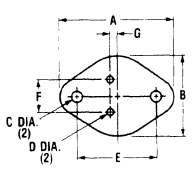
THERMAL INTERFACE PADS - TYPICAL PROPERTIES

	ISOSTRATE	THERMSTRATE
Contact Thermal Resistance, °C/W	0.167	0.019
Thermal Conductivity BTU in/HR ft²F	3.27	28.74
Dielectric strength, V	4000	N/A
Maximum Services Temperature ° C	200	200
Reflow Temperature °C	51	51
Thickness, inches	.003	.003
Mounting Pressure Range, (psi)	100-1000	100-1000

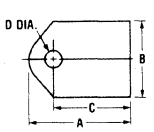
®Kapton is a Registered Trademark for Du Pont Polyimide

Selected ISOSTRATE Pad Outlines

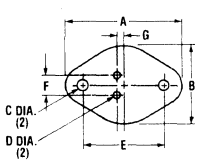
TO-3 STYLE



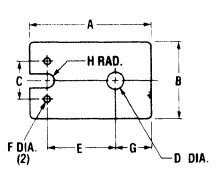
TIP PACKAGES TIP-36



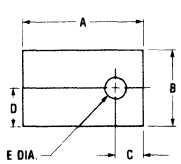
TO-66



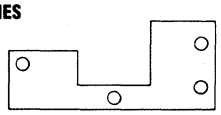
PLASTIC POWER



TO-220 TO-218 TO-247 TO-3-P

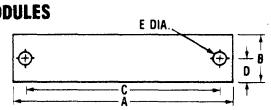


CUSTOM COMPONENT OUTLINES

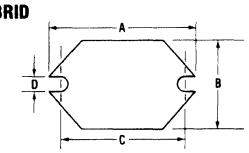


Selected THERMSTRATE Pad Outlines

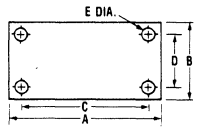
SCHOTTKY SCR AND DARLINGTON MODULES



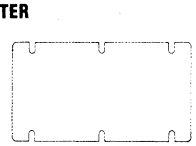
POWER HYBRID



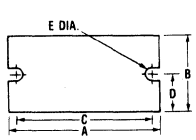
SCR AND DARLINGTON MODULES



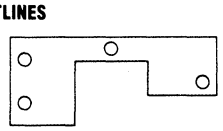
DC-DC CONVERTER



SOLID STATE RELAY AND SCR MODULES

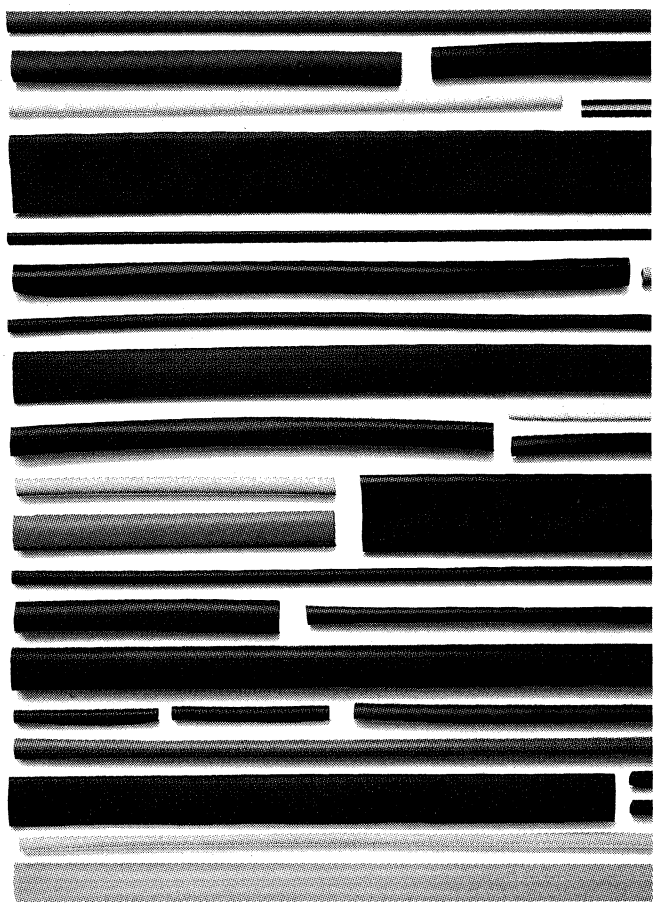


CUSTOM OUTLINES



WE INVENTED HEAT-SHRINK TUBING 30 YEARS AGO.

AND EVERY YEAR THEREAFTER.

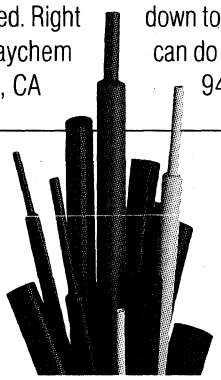


After creating the world's first heat-shrink tubing in 1957, we rested on our laurels. For about 24 hours. Then we set to work inventing the broadest selection of tubing available anywhere. Solving the widest variety of problems imaginable. Today, no company supplies heat-shrink tubing in so many materials, constructions, listings and approvals.

No company supplies as much experience and support, either. And because our distributors are the best in the world, you get quick, local response to every need. Right down to special orders and expedites.

Call 415) 361-7595 and find out what Raychem can do for you. After all, no one else can do more. Raychem Corporation, 300 Constitution Drive, Menlo Park, CA 94025-1164.

Raychem



Thermofit® Heat-Shrinkable Tubing

© 1987 Raychem Corporation Printed in USA (B7084) H53450 5-89

"Bring us your wires, your connectors, your muddled harnesses — and you may breathe free."

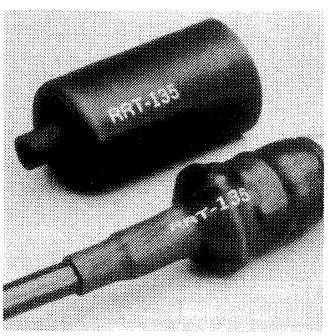
— R. A. Wold
MCMLXXXVIII

Getting it all together can be a problem in the electronics industry. We can help.

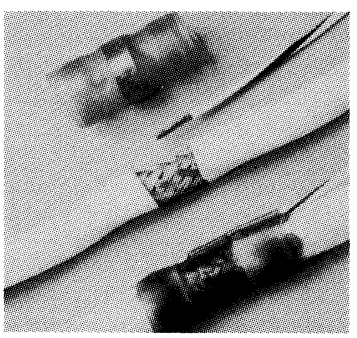
Our product lines include Heat-Shrinkable Tubing, Shield Termination Sleeves, Molded Parts and Splicing Products.

The fast, easy installation of Remtek Heat Shrinkable Products can provide electrically superior, low-cost, environmentally protected connections and terminations, as well as outstanding wire and harness identification.

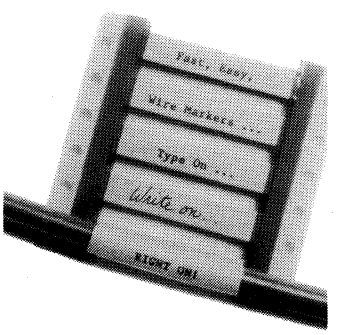
In other words, you bring the wires and the connectors and we'll show you how to Get It All Together!!



Heat-Shrinkable Tubings include:
General Purpose Tubing,
Dual-Wall/Adhesive Lined,
Medium-Wall/Thin-Wall
Special Properties Tubing



Remtek RTS Termination Sleeves: for coax and other shielded cables and electrically superior splices.



Remtek RQM Qwik Mark Marking System. Fast, Easy, Permanent, Do-it Yourself wire and cable markers.

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BACKPANELS

Manufacturer	Starting EEM Page No.	Model/ Series	Plug-in	Interface Computer/ Peripheral	Spacing In Inches	Power BUS	Pattern
Augat	C•1706	J1, J2, VME	√	√		√	Hi-Pak, Fastpak w/PGA
		R	√	√	.3, .6, .9, .13		Universal
		8136 Multibus	√	√	.3, .6, .9	√	Universal, Fastpak, Hi-Pak w/PGA
		8136 Multibus II	√	√	.3, .4, .6, .9		Fastpak, Hi-Pak w/PGA
		8136 IBM PC, XT, AT	√	√	.3, .4, .6, .9		Fastpak, Hi-Pak w/PGA
Dage Precision Industries	C•1710	VME P1	√	√	160 mm	√	DIN/Eurocard
		VMEP2	√	√	220 mm	√	DIN/Eurocard
		STE	√	√	20.32/15.24 mm	√	Extender card
EMS/Sandberg	C•1713	Metric Series	√	√	.8 or 1.2	√	TTL, SCH, ECL, HSU
Mupac	C•1716	VME Multibus, Multibus II, Sun, UXI, Euro		√	.6, .75, .8	√	
Precicontact	C•1718	101 Multibus		√	0.3, 0.6, 0.9		Universal
Product Technology	C•1719	VME, Multibus, IBM PC/XT/AT, S-100	√	√			DIN/Eurocard
Vector Electronic Co.	C•1722		√	√	0.8		

BOARDS, PLUG-IN

Manufacturer	Starting EEM Page No.	Extender	Interface	Memory	Processor	Prototype
Augat	C•1706	√	√	√	√	
Dage	C•1710			√	√	
EMS	C•1713	√	√	√	√	√
Mupac	C•1716	√				√
Precicontact, Inc.	C•1718					√
Product Technology	C•1719			√	√	
Vector	C•1722	√	√			√

PROGRAMMING BOARDS/SYSTEMS/SWITCHING MATRICES

Manufacturer	Starting EEM Page No.	Series/ Model	Type of Connections	No. of Connections	Fixed
Augat	C•1706		Inverse male DIN; Inverse female right angle DIN; Standard female DIN; 6-row double DIN	4	√
Product Technology	C•1719	VME Multibus; IBM PC-XT, AT, S-100, Std. Bus	Wirewrap		

BUS BARS & SYSTEMS

Manufacturer	Starting EEM Page No.
Atlee	C•1704
Tech-Etch	C•1720
Vector Electronics Co.	C•1722

eem MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination.* This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float.* Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof.* May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card.* The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement.*

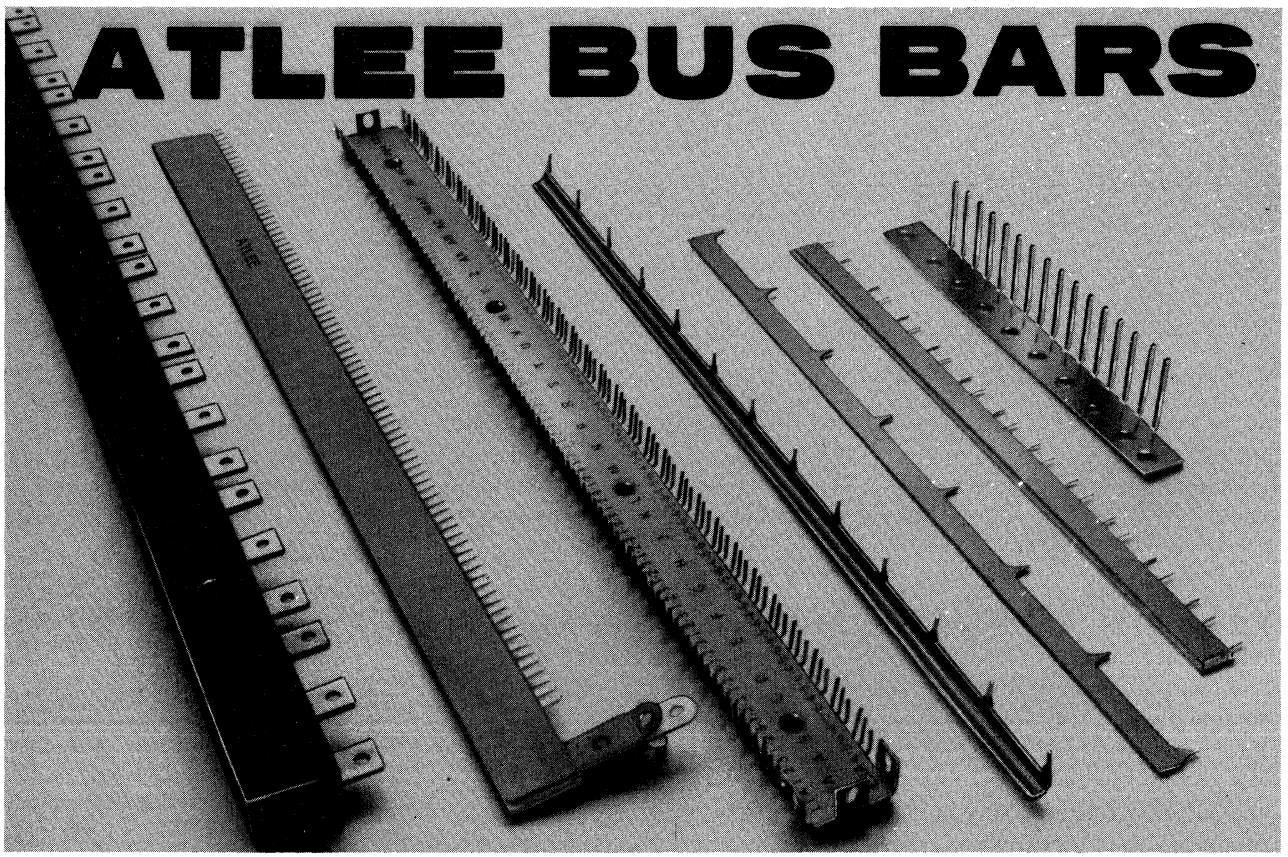
Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage.* Can be confused with the term used to describe how many times a connector may be mated and separated.

Withstanding voltage: Also called *test voltage.* The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

ATLEE BUS BARS



Atlee is a full line manufacturer of bus bars, serving the computer industry, avionics, military contractors and various high tech manufacturers. We have available design and engineering services as well as prototype department. In addition, Atlee has sales representatives nationwide to service our customers. Please contact Atlee to service your bus bar requirements.

TO SPECIFY AN ATLEE BUS BAR

Please contact the factory for a bus bar catalog and any questions you may have.

TO SPECIFY A CUSTOM BUS BAR

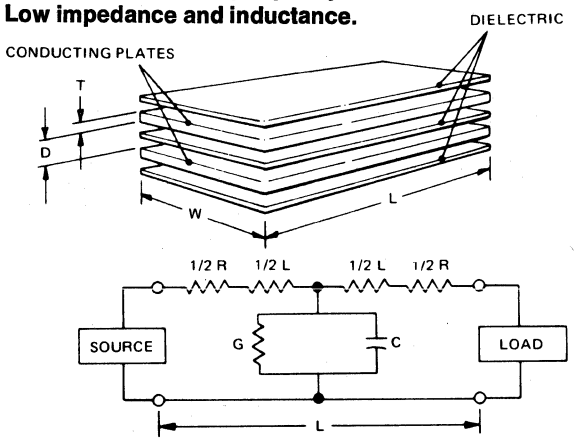
If your requirements do not permit the use of an Atlee Standard Bus Bar, send a drawing print or even a rough sketch of the Bus Bar that would meet your specifications and let Atlee's Engineering & Sales Department work out the details and give you a quotation. Atlee will manufacture any type bus bar to your specifications. In general the information required includes:

1. Application
2. Space available
3. Current paths required
4. Type of terminations
5. Number and location of terminations
6. Current requirements
7. Voltage drop requirements
8. Tab to tab spacing on each conductor
9. Type of mounting
10. Dielectric strength
11. Environmental requirements
12. Type finish on conductors
13. Marking

DESIGNER'S NOTES

Atlee laminated bus bars consist of flat conductor layers stacked on one another and separated by appropriate dielectrics. Typically such an assembly is laminated and edge-sealed or encapsulated so that the final product becomes a rigid unit with high reliability and stable electrical and mechanical properties. These properties provide uniform capacity, low impedance, and high-speed transmissions of signal and current. Atlee bus bars are an economical alternative to multi-layer printed circuit boards and wire harnesses. They offer:

- **Lowered production costs,** because assembly is simple and fast.
- **Reduced volume** which permits higher density packaging than possible with wire harnesses.
- **Reduced noise** with ideally distributed capacitance and isolation of conductors.
- **High current-carrying capacity.**
- **Low impedance and inductance.**



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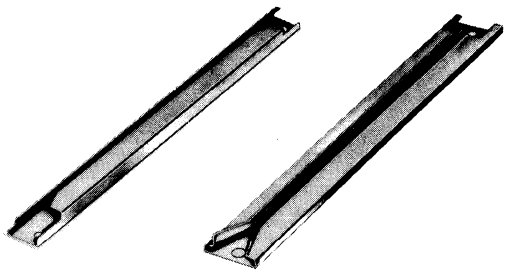
ATLEE CARD GUIDES

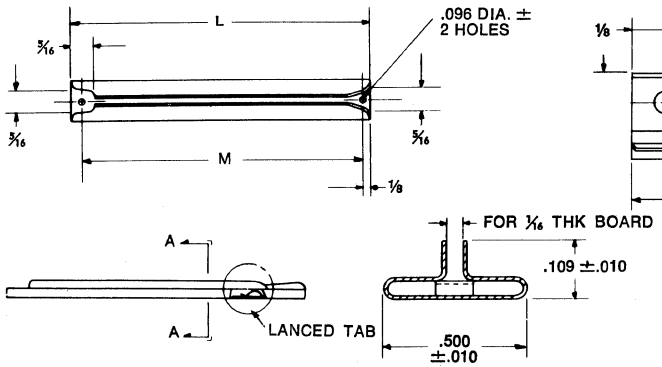


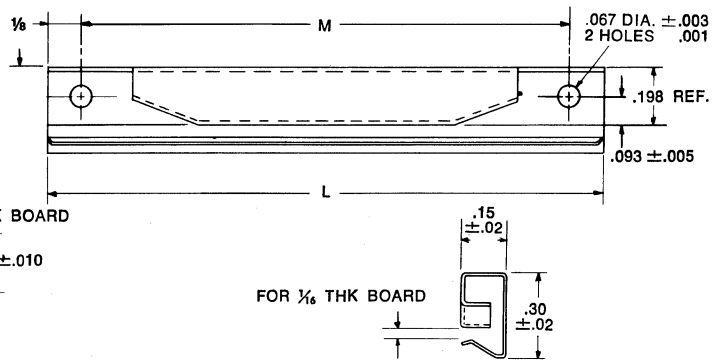
FEATURES

- High retention of printed circuit board under severe shock and vibration.
- Easily installed by welding or riveting.
- Quick and simple board insertion and withdrawal.
- Rigidly mounted printed-circuit board in racks and other types of assemblies.

MATERIAL: *beryllium copper, .010 thick, alloy 25, per QQ-C-533a, condition ¼ hard.

PLATING: .0003 thick cadmium per QQ-P-416a, type II, class 2.





*** 11903-300**

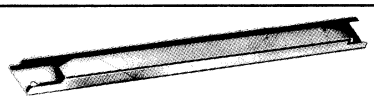
	L ±.02	M ±.005		L ±.02	M ±.005
2	2½	2.250	7	5	4.750
3	3	2.750	8	5½	5.250
4	3½	3.250	9	6	5.750
5	4	3.750	10	6½	6.250
6	4½	4.250	11	7	6.750

* Standard in beryllium copper and stainless steel.

*** 11909-300**

	L ±.02	M ±.005		L ±.02	M ±.005
1	2	1.750	6	4½	4.250
2	2½	2.250	7	5	4.750
3	3	2.750	8	5½	5.250
4	3½	3.250	9	6	5.750
5	4	3.750			

* Standard in beryllium copper and stainless steel.



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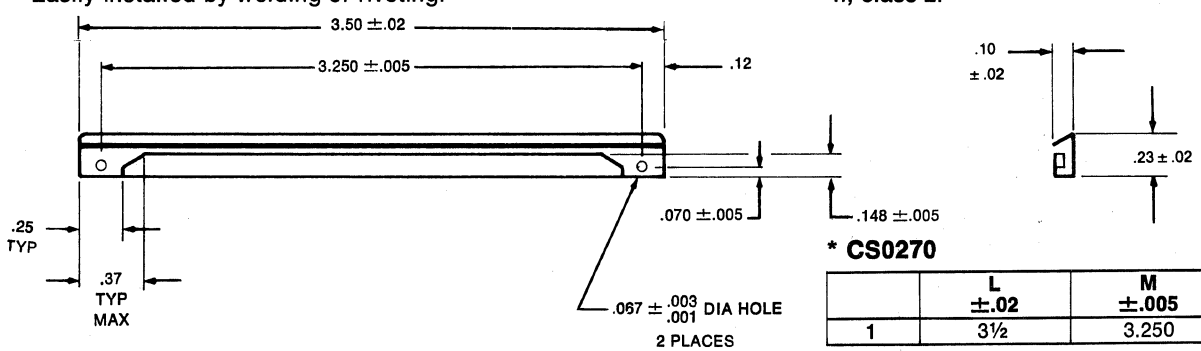

*** CS0270**

	L ±.02	M ±.005
1	3½	3.250

* Standard in beryllium copper and stainless steel.

- Card guides available for 1/32 and 3/32 thick printed circuit boards.
- Flared card guides also available.
- Refer to Atlee Cross Reference for additional card guides we manufacture.
- Card guides designed and manufactured to your specifications.

Please consult factory for additional card guide requirements.

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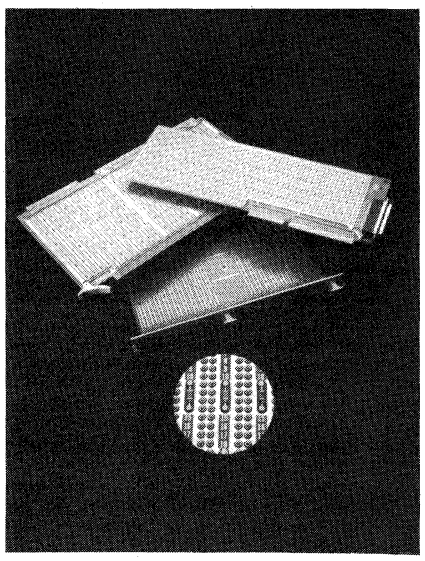
Electronic Packaging Solutions

FASTPAK® Panels

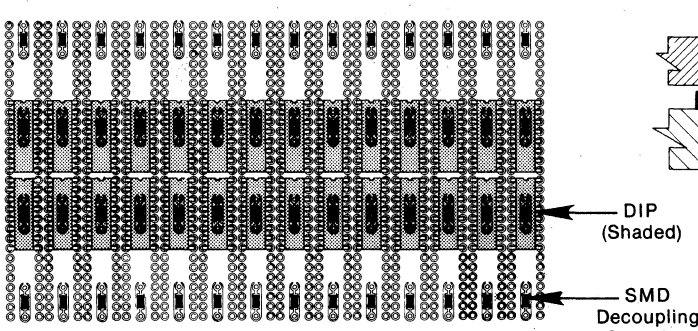


NEW! **FASTPAK** *NEW!*

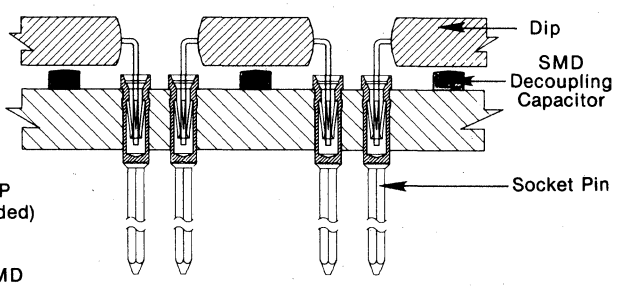
- Highest component density of any wire-wrap panel
- SMD decoupling capacitors mounted under DIPs ensure better operating performance for high power and high speed IC's
- Solder washers eliminate wire wrapping from the power and ground sources
- Continuous power and ground planes surround each pin

Multibus I & II, VME, IBM PC/AT

Bus Style	Height × Depth	FASTPAK Without PGA Footprints	FASTPAK With PGA Footprints	# of IC's (–02 Series)
VMEbus	3U × 160	8136-VME316-02	NA	48
VMEbus	3U × 220	8136-VME322-02	NA	72
VMEbus	3U × 280	8136-VME328-02	NA	96
VMEbus	6U × 160	8136-VME616-02	8136-VME616-03	126
VMEbus	6U × 220	8136-VME622-02	8136-VME622-03	189
VMEbus	6U × 280	8136-VME628-02	8136-VME628-03	252
VMEbus	9U × 220	8136-VME922-02	8136-VME922-03	264
VMEbus	9U × 280	8136-VME928-02	8136-VME928-03	363
Multibus II	6U × 220	8136-MB622-02	8136-MB622-03	189
Multibus I	12.0″ × 6.75″	8136-MB1-02	8136-MB1-03	182
IBM PC/AT	13.1″ × 4.7″	8136-IAT3-37-02	8136-IAT3-37-03	128

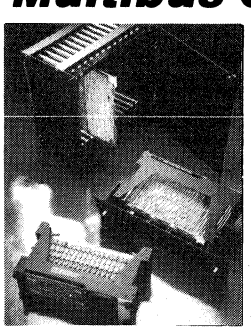


FASTPAK Pattern Sample
(Top View)



FASTPAK
(Edge View)

Multibus Card Cage



Multibus card cages/backplanes are available in a wide variety of card spacing, card slots, and P2 backplane options. The parallel priority option is field installable in all chassis with 8 or more slots.

Connector Spacing	Range Of Slots	Options	P2 Backplane	
			With Power	W/O Power
.6″	4-26	Parallel Priority, –5V Reg.	Yes	Yes
.75″	5-21	Parallel Priority, –5V Reg.	Yes	Yes

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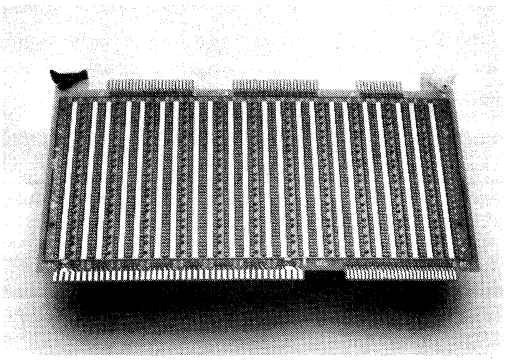
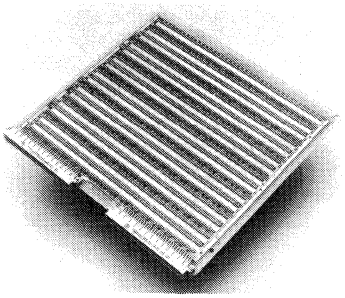
Multibus Panels

Model Number	IC Pattern	# of IC's	I/O
8136-MB1-02	FASTPAK	182	User supplied header
8136-MB1-03	FASTPAK/PGA	162/4	User supplied header
8136-HPG10	Hi-Pak	132	3 Ribbon Cable Headers
8136-HPG20	Hi-Pak	132	126 Card Edge Fingers
8136-SHPG56	Hi-Pak/PGA	90/6	User supplied header
8136-HPG41	Hi-Pak/PGA	106/4	User supplied header
8136-LG1311	Hi-Pak/PGA	254/8	User supplied header
8136-MLT6	Hi-Pak/PGA	106/4	User supplied header
8136-UG159	Universal	108	3 Ribbon Cable Headers
8136-LG912	Universal	108	126 Card Edge Fingers
8136-LG918	Universal	108	100 Card Edge Fingers
8136-SCH203	Universal	108	126 Card Edge Fingers
8136-ISBX36(44)	Adapter for 36 or (44) pin iSBX boards		
8136-EXT17	Extender Card		



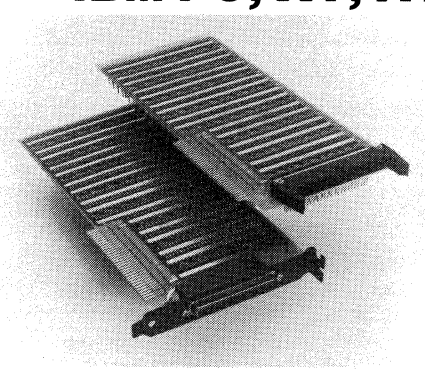
Multibus II Panels

Model Number	IC Pattern	# of IC's	I/O
8136-MB622-03	FASTPAK	189	User supplied header
8136-MB622-03	FASTPAK/PGA	186/3	User supplied header
8136-MB2-10	Hi-Pak	35	2 96-pin DIN
8136-MB2-30	Hi-Pak	135	2 96-pin DIN



IBM PC, XT, AT

Model Number	IC Pattern	Length Of Panel	# of IC's	I/O
8136-IAT-37 -02	FASTPAK	13.1″	128	37 pin D-Sub
8136-IAT-37-03	FASTPAK/PGA	13.1″	108/2	37 pin D-Sub
8136-HPG8	Hi-Pak	5.2″	25	50 pin Ribbon Cable
8136-HPG18	Hi-Pak	9.2″	57	50 pin Ribbon Cable
8136-HPG28	Hi-Pak	13.2″	89	50 pin Ribbon Cable
8136-IPC1-25	Hi-Pak	5.2″	25	25 pin D-Sub
8136-IPC2-25	Hi-Pak	9.2″	54	25 pin D-Sub
8136-IPC3-25	Hi-Pak	13.2″	86	25 pin D-Sub
8136-IPC1-37	Hi-Pak	5.2″	25	37 pin D-Sub
8136-IPC2-37	Hi-Pak	9.2″	54	37 pin D-Sub
8136-IPC3-37	Hi-Pak	13.2″	86	37 pin D-Sub
8136-IAT3-37	Hi-Pak	13.1″	82	37 pin D-Sub



R Series

Wire-Wrap Panel IC Patterns

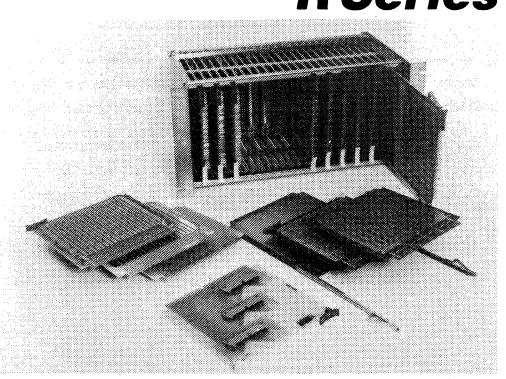
- TTL Universal
- 16 and 20 pin committed TTL
- TTL Hi-Pak
- Schottky
- ECL (10K, translators)

Accessory Cards

- Extender Cards (TTL and ECL)
- TO-3 and DIP
- Blank Cards
- Pre-Drilled only

Card Cages and Backplanes

- 1.2″ centers with 3, 6, 9 or 13 slots
- TTL or ECL (controlled impedance backplanes



AUGAT® Quality and Innovation 452 John Dietsch Blvd., Attleboro Falls, MA 02763 (508) 699-9800 FAX (508) 699-6717

VME BACKPLANES & CARD CAGES - ANY SIZE, 3-21 SLOTS

Augat's vertical integration provides our customers with additional benefits. Because we're one of the few backplane manufacturers that make our own DIN connectors, you know Augat backplanes will meet the same high standards from batch to batch. And, when you turn your system design over to volume production, Augat's extensive manufacturing capabilities will ensure you of the right volume price.

J1/J2 MONOLITHIC SERIES BACKPLANES

☐ Designed to VMEbus (Rev. C.1) ☐ High performance — Up to 40 MBytes/Sec ☐ 6-layer construction ☐ On-board termination ☐ More stable GND reference; One piece J1/J2 ☐ Excellent power distribution; 2 VCC planes and 2 GND planes, 2 oz. copper per plane ☐ 5 auxiliary power busses ☐ Bus grant jumper pins on both sides ☐ 3 through 21 slots.

Part Number 8160-VME021E-A

Number of Slots — 03 through 21

A=Screw-on cube, **B**=Snap-on lug, **C**=Press-fit post — Power Terminal Styles

J1/E SERIES BACKPLANES

☐ Designed to VMEbus (Rev. C.1) ☐ High performance — Up to 40 MBytes/Sec ☐ 6-layer construction ☐ On-board termination ☐ Excellent power distribution; 2 VCC planes and 2 GND planes, 2 oz. copper per plane ☐ Bus grant jumper pins on both sides ☐ 3 through 21 slots.

Part Number 8160-VME121E-A

Number of Slots — 03 through 21

A=Screw-on cube, **B**=Snap-on lug, **C**=Press-fit post, **D**=Terminal block — Power Terminal Styles

J1/VH SERIES BACKPLANES

☐ Designed to VMEbus (Rev. B) ☐ High performance — Up to 40 MBytes/Sec ☐ 6-layer construction ☐ On-board termination ☐ Low crosstalk; 3 signal layers ☐ Power distribution; 1 VCC plane and 2 GND planes, 2 oz. copper per plane ☐ Snap-on power terminals ☐ Bus grant jumper pins on both sides ☐ 5,9,12 or 20 slots.

Part Number 8160-VME120VH

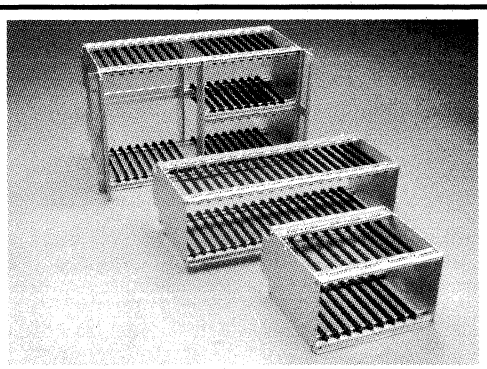
Number of Slots — 05, 09, 12, 20

J1/H SERIES BACKPLANES

☐ Designed to VMEbus (Rev. B) ☐ Standard performance ☐ 4-layer construction ☐ On-board termination ☐ Power distribution; 1 VCC plane and 1 GND plane, 2 oz. copper per plane ☐ Power terminals; Screw-on cubes, Snap-on lugs ☐ Bus grant jumper pins on pin side only ☐ 5,9,12 or 20

Part Number 8160-VME120VH

Number of Slots — 05, 09, 12, 20



CARD CAGES PART NUMBERING SYSTEMS (KITS)

For full size (84HP) and half size (42HP) card cages:

Part Number 8170-VME316-K1A

3 = 3U height, **6** = 6U height, **9** = 9U height

16 = 160mm depth, **22** = 220mm depth, **28** = 280mm depth, **40** = 400mm depth* (*Available in 9U only)

A = Rack mount w/handles, **B** = Rack mount, no handles, (Blank) = No rack mount, no handles

K1 = Full width (84HP), **K2** = Half width (42HP)

For all other widths:

Part Number 70-N316-12

3 = 3U height, **6** = 6U height, **9** = 9U height

HP's 12HP thru 41HP & 43HP thru 83HP

16 = 160mm depth, **22** = 220mm depth, **28** = 280mm depth, **40** = 400mm depth* (*Available in 9U only)

Note: 1HP = .2" — Allow 4 HP's per slot to achieve full working aperture with rack mount flanges. If rack mount flanges are not used, subtract 1 HP from HP total.

(All sizes come with rack mount flanges and handles)

J2/E SERIES BACKPLANES

☐ Designed to VMEbus (Rev. C.1) ☐ Standard performance ☐ 3-layer construction ☐ On-board termination ☐ Power distribution; 1 VCC plane and 1 GND plane, 2 oz. copper per plane ☐ 3 through 21 slots

Part Number 8160-VME221E-A

Number of Slots — 03 through 21

A=Screw-on cube, **B**=Snap-on lug, **C**=Press-fit post, **D**=Terminal block — Power Terminal Style

J2/H SERIES BACKPLANES

☐ Designed to VMEbus (Rev. B) ☐ Standard performance ☐ 4-layer construction ☐ On-board termination ☐ Power distribution; 1 VCC plane and 1 GND plane, 2 oz. copper per plane ☐ Power terminals; Screw-on cubes, Snap-on lugs ☐ 5 auxiliary power busses ☐ 5,9,12 or 20 slots

Part Number 8160-VME220

Number of Slots — 05, 09, 12, 20

J3/E SERIES BACKPLANES

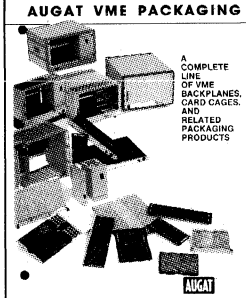
☐ 2-layer construction ☐ Unbussed ☐ Connectors on .8" centers ☐ Power distribution; 1 VCC plane and 1 GND plane, 2 oz. copper per plane ☐ Optional termination sockets ☐ 5,9,12,15,20,21 slots

Part Number 8160-VME321E-A

Number of Slots — 05, 09, 12, 20, 21

A=Screw-on cube, **B**=Snap-on lug, **C**=Press-fit post — Power Terminal Style

AUGAT VME PACKAGING



MINIGLOSSARIES
FORMULAS • CHARTS
PRODUCT SELECTION GUIDES
FORMS
CODES
TECHNICAL INFORMATION

WHERE TO FIND THEM IN THE 88/89 EDITION OF EEM

Abbreviations/Acronyms ..... **A**•1404, **B**•1090, **C**•1119 **D**•1156
AC Power Supplies, Product Selection Guide..... **D**•2156
ASCII Code ..... **D**•1080
Batteries, Product Selection Guide.... **D**•1447
Batteries & Fuel Cells, Characteristics..... **D**•1450
Cabinets, Enclosures, Racks & Chassis, Product Selection Guide..... **C**•1003
Capacitors, Basic Formulas..... **A**•1093
Capacitors, Miniglossary..... **A**•1066
Capacitors, Product Selection Guide **A**•1002
Coils, Chokes, Inductors, Product Selection Guide..... **A**•1197
Conductors, Maximum Current Capacity of Copper & Aluminum... **A**•2272, **C**•1316
Connectors, Miniglossary..... **C**•1271
Connectors, Terminals & Sockets, Product Selection Guide..... **C**•1127
Crystals, Oscillators, Crystal & Piezoelectric Filters, Product Selection Guide..... **A**•1339
DC Power Supplies, Product Selection Guide..... **D**•1537
Delay Lines, Product Selection Guide..... **A**•1503
Dielectrics, Thermal Conductivity..... **B**•1916
Discrete Semiconductors, Product Selection Guide..... **A**•2154
Displays, Readouts, & CRTs, Product Selection Guide..... **B**•1041
EBCDIC Code ..... **D**•1086
Encapsulation, Miniglossary..... **C**•1124
Fans, Blowers, Cooling Equipment, & Heat Exchangers, Product Selection Guide..... **C**•1631
Fiber Optics, Miniglossary ..... **B**•1185
Fiber Optics, Product Selection Guide..... B•1204
Filters, Power, Product Selection Guide..... **A**•1642
Filters, Signal, Product Selection Guide..... **A**•1683
IC Master ..... **A**•1740
Instruments, Test & Measuring, Product Selection Guide..... **D**•1210
Interconnection Systems, Product Selection Guide..... **C**•1702
Keyboards & Keypads, Product Selection Guide..... **B**•1854
Lamps, Lights, & Indicators, Product Selection Guide..... **B**•1126
Logofinder & Trademark Directories... **C**•901
Microwave Components, Product Selection Guide..... **A**•1776
Military Qualified Products List..... **B**•1002
Motors, Drives, & Rotating Components, Product Selection Guide..... **B**•1221
Opto Semiconductors, Miniglossary ..... **A**•2169
Oscilloscopes, Product Selection Guide..... **D**•1426
Panel Hardware, Product Selection Guide..... **C**•1583
Panel Meters, Analog & Digital, Product Selection Guide..... **D**•1376
Potentiometers, Trimmers, Controls, & Rheostats, Product Selection Guide..... **A**•2078
Power Supplies, Miniglossary ..... A•2276, **D**•1541
Power Supplies, AC, Product Selection Guide..... **D**•2156
Power Supplies, DC, Product Selection Guide..... **D**•1537
Protective Components (Fuses, Circuit Breakers, etc.), Product Selection Guide..... **B**•1351
Relay Contact Forms..... **B**•1450
Relays, Electromechanical, Miniglossary..... **B**•1414
Relays, Product Selection Guide..... **B**•1411
Resistor Color Codes..... **A**•1952
Resistors, Product Selection Guide ... **A**•1867
Servo Components, Miniglossary..... **B**•1266
SI Units, Basic Guide To, ... **A**•1434, **B**•1472, **C**•1692, **D**•1386
Solenoids, Product Selection Guide... **B**•1655
Switches, Product Selection Guide.... **B**•1673
Symbols—International Authorities ..... **A**•1454, **B**•1064, **C**•1104, **D**•1166
Thermal Components, Product Selection Guide..... **B**•1886
Thermal Conductivity of Dielectrics at Room Temperature..... **B**•1916
Thyristors/High Power Diodes, Miniglossary..... **A**•2211
Timers, Miniglossary..... **B**•1492, **D**•1140
Trademark & Logofinder Directories... **C**•901
Transducers & Encoders, Product Selection Guide..... **B**•1928
Transformers, Product Selection Guide..... **A**•2215
Voltage Drop Nomograph ..... **A**•2262, **C**•1469, **C**•1960 **D**•1718
Wire & Cable, Product Selection Guide..... **C**•1755
Wire Gauges—Diameter, Area, Copper Weight..... **C**•1343, **C**•1759

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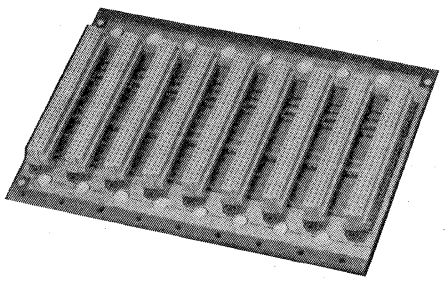
TELEPHONE: (415) 683-3930

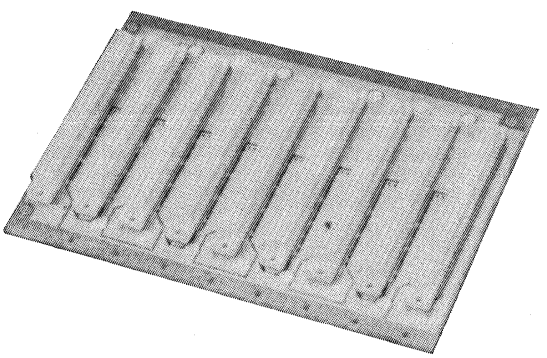
VME P1 BACKPLANES



The P1 backplane is the main VME bus and has been designed as a 6 layer multilayer with signal tracks on layers 1 and 6, Ov on layer 2 and 5 (fully gridded), and "Daisy Chain" on layer 3 and +5v on layer 4. Wide areas of copper between the connectors and to within 8mm of the edge of the board have been allocated to power rails giving the backpanel the ability to deal with power needs to the maximum levels of the VME Specification. Separation of signal tracks (design width 0.38mm) from ground planes is 1mm giving a design characteristic impedance of 100 ohms prior to termination. Priority jumpering is accomplished by means of push-on jumpers or wire-wrapping to the terminals provided between the connector positions, or alternatively to the rear of the connector terminals when long terminals are specified (see ordering information).

Power input, as with the Expansion Bus, is by means of Press-Fit M4 Threaded Studs at the positions specified in the detailed drawing, with the exception of the 4 slot version which has only +12v. −12v. and +5v. on the lower power rails, with 0V and +5V on the upper power rails.

VME P2 BACKPLANES



The P2 backplane is the I/O Expansion Bus and has been designed as a 3 layer multilayer with a signal track on layer 1, and 0v on layers 2 and 3. This method of design allows a controlled characteristic impedance of approx. 100 ohms unterminated since the separation signal tracks from ground plane is 1mm. The additional ground plane, apart from its electrical characteristics, allows the board to be built to an overall thickness of 3.2mm giving it the strength it needs as a structural member in a card frame system.

Power input is by means of Press-Fit M4 Threaded Studs at the 0v and +5v. positions specified in the dimensional drawing.

BACKPLANE SPECIFICATIONS

SERIES V115- AND V213-

Backplane Material:	FR4, 3.2mm overall thickness, multilayer construction
Connector Mouldings:	Glass-loaded Polyester, UL94V-O approved
Contact Material:	Phosphor Bronze
Contact Plating:	0.8 Microns Au over Ni
Terminal Plating:	0.4 Microns Au over Ni
M4 Studs:	Phosphor Bronze, Electroplated Tin
Contact Resistance	7 milliohms max. through mated
Connectors:	contacts
Current Rating:	3 amps per contact
Insertion Force:	3 — 4 ozs. per contact
Withdrawal Force:	0.7 oz. min per contact
Insulation Resistance:	10^4 megohm min.
Operational Temperature:	−55° to +125°C
Dielectric FR4:	Greater than 500v DC per MIL breakdown

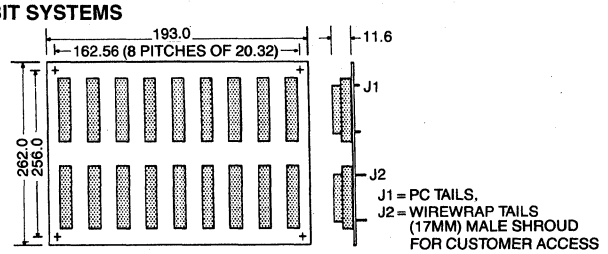
BACKPLANES

PART NUMBER	DESCRIPTION	
V115-404-96- - -	P1 Compatible Backplane	4 Slot
V115-405-96- - -	P1 Compatible Backplane	5 Slot
V115-407-96- - -	P1 Compatible Backplane	7 Slot
V115-409-96- - -	P1 Compatible Backplane	9 Slot
V115-413-96- - -	P1 Compatible Backplane	13 Slot
V115-414-96- - -	P1 Compatible Backplane	14 Slot
V115-417-96- - -	P1 Compatible Backplane	17 Slot
V115-421-96- - -	P1 Compatible Backplane	21 Slot

PART NUMBER	DESCRIPTION	
V213-404-96- - -	P2 Compatible Backplane	4 Slot
V213-405-96- - -	P2 Compatible Backplane	5 Slot
V213-407-96- - -	P2 Compatible Backplane	7 Slot
V213-409-96- - -	P2 Compatible Backplane	9 Slot
V213-413-96- - -	P2 Compatible Backplane	13 Slot
V213-414-96- - -	P2 Compatible Backplane	14 Slot
V213-417-96- - -	P2 Compatible Backplane	17 Slot
V213-421-96- - -	P2 Compatible Backplane	21 Slot

DOUBLE HEIGHT VME BACKPLANES

NEW SERIES V316 OFFERS ECONOMICAL FOUNDATION FOR 32 BIT SYSTEMS



The V316 Series represents a significant step forward towards achieving higher performance at no cost penalty.

The V316 series is developed from our market leading single height backplanes and therefore incorporates our patented screening loop feature. J1 and J2 are incorporated in one pcb which gives the advantage of common ground and voltage planes.

Further Information
9 slot part number: V316-409-96-H039
For other slot sizes or sample review, phone.

- Common Ground and Voltage Planes
- Re-routed BUS BUSY Lines
- On board Termination
- 100% ATE Tested
- Power Access by Multiple 0.25" Tab Terminals
- 6 Layer Multilayer
- Controlled IMP.
- 5, 7, 9, 12, & 20 Slots

NOTE: Slot sizes other than those listed above are available to special order with a lead time of 1 to 2 weeks. Please phone for details.

DAGE PRECISION INDUSTRIES
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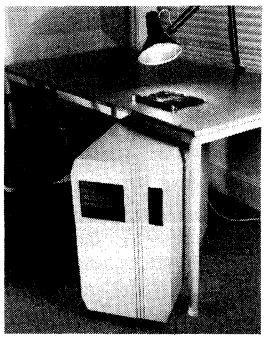
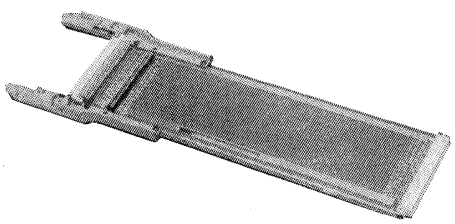
FOUNDATION SYSTEM ENCLOSURES
FOR VME AND STE



The Dage Foundation series offers a complete range of packaging solutions across the VME and STE bus environment.

- Mixed depth (160/220 mm) systems
- Mixed height (3u/6u) systems (note this could cater for mixed VME/STE systems)
- Half width enclosures
- Tower Enclosures
- Horizontally mounted VME boards
- Wiring and mounting special connectors
- Extra power supplies, e.g. for I/O
  for ECL
- Extra large Winchester Drive
- Tape Drive

VME EXTENDER BOARDS
VME COMPATIBLE PRODUCTS



Multilayer high speed low noise VME extender cards available in two lengths to suit double Eurocards, and for special applications, double extended Eurocards.

Fully gridded ground plane ensures low noise and low signal degradation. Features full jumpering capability for user configuration.

VME — ADP — 01 — P — Fully assembled extender board to suit 160mm. deep double Eurocards.

VME — ADP — 02 — P — Fully assembled extender board to suit 220mm. deep double Eurocards.

NOTE: This board features both P1 and P2 connections.

VSB Backplanes

- Conforms to VSB specification Rev 1.A
- 2-6 slots available
- Off-board termination
- 4 layer construction
- Fully ATE electrically tested

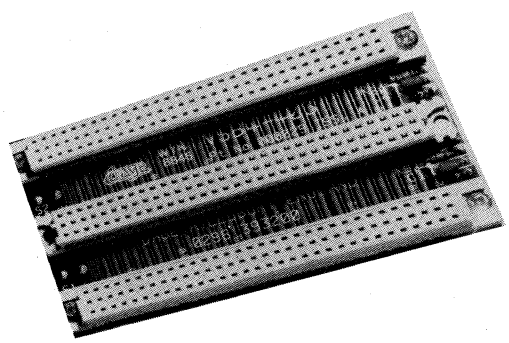
VME Subsystem Bus (VSB)

VSB is a local subsystem extensions bus which allows a processor board to access additional memory and I/O on the local bus using rows A and C of the P2 and VSB connectors. This reduces the load on the main bus and improves the overall throughout of the system. The VSB4 backplane can be rear-plugged on to an existing VME J2 backplane.

VSB4 has been developed using 4 layer, 3.2mm thick pcbs, and conforms to VSB specification Rev A.1 providing for 2 to 6 slots. The backplanes use high quality press-fit DIN 41612 connectors. In accordance with the VSB specification, VSB4 provides for a jumper between connector pins J2A31 and J2C32 to ensure continuation of the BGIN*/BGOUT* daisy chain when a VSB slot position is left unoccupied.

A small 4HP wide detachable module provides VSB termination. The module is mounted to the rear of the VSB backplane, taking up minimal space, and may be permanently bolted to the backplane using connector bolt holes. Providing resistive termination for all VSB signal lines, the module is suitable for all backplane widths up to six slots. One module is supplied with each backplane.

Conforming to the VSB specification, the VSB backplane has been provided with power pickup points which are placed along the top margins of the backplane for all +5V and Ground requirements.



ORDERING INFORMATION

VSB Backplanes

2 slot VSB4-402-644029
3 slot VSB4-403-644029
4 slot VSB4-404-644029
5 slot VSB4-405-644029
6 slot VSB4-406-644029

VSB Termination

VSB-P2-NETWORK

COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

W
WPS word processing software

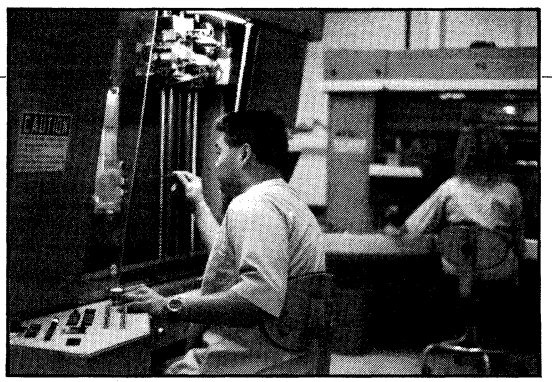
Y
YIG yttrium iron garnet

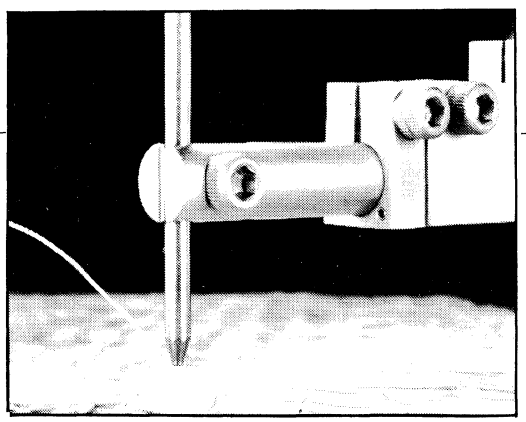
Z
ZIF zero insertion force

EMS AUTOMATED SERVICES

AUTOMATIC AND SEMI-AUTOMATIC WIRE WRAPPING

Quick, seven-day turnaround, including data processing, is standard. Four day turnaround is available. All wiring is 100% inspected to MIL-STD-1130 and EIA STD RS-280-A for unacceptable wraps, wire dressing and tightness, and wrap levels. EMS also offers a zero wiring error guarantee on tested panels.



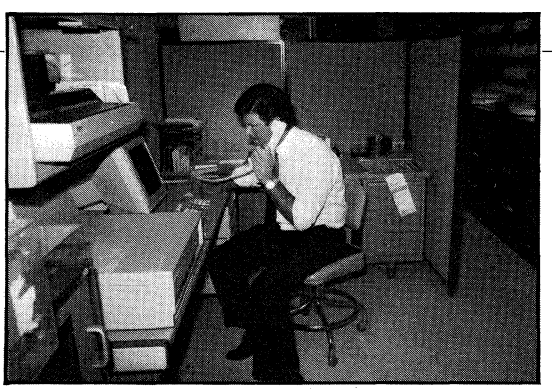


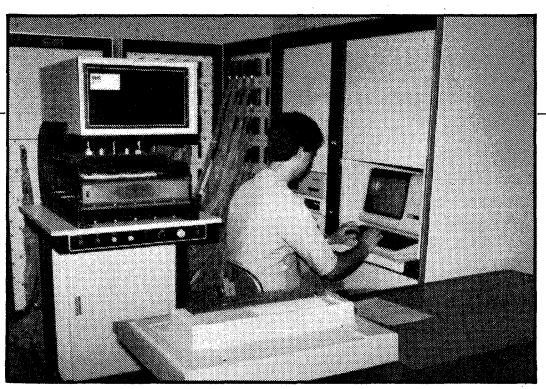
STITCH WIRING SERVICES

EMS provides semi-automatic stitch wiring services for prototype or production work. Stitch wiring can be used for a wide variety of commercial and military applications including ground support, shipboard, airborne, satellite and torpedo systems. Bonds are tested to U.S. Navy Specification WS14783. An excellent discrete wiring system for use with high speed circuits and low-profile applications.

DATA PROCESSING SERVICES

Wire lists are created from floppy disk, tape, schematics, or card decks by our in-house data processing department. Data can also be transferred via telephone modem. Extensive error-trapping software detects design flaws, helping to ensure an error-free end product. Quick telephone notification to customers of wire list errors helps keep projects on schedule.





TESTING SERVICES

EMS tests bare printed circuit boards for as little as 50 cents a piece. Wire wrap boards and backplanes receive 100% continuity test to guarantee zero wiring errors. 500 voltage testing is available. EMS also manufactures test fixtures to customer requirements.

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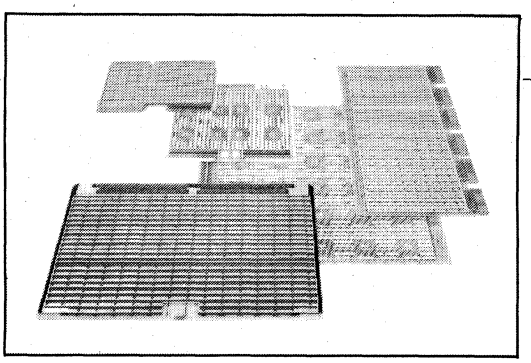
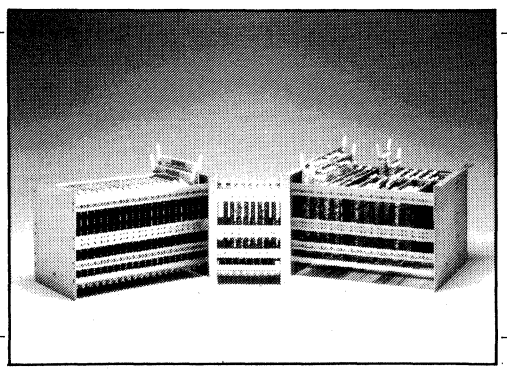
EMS PACKAGING SYSTEMS

PRINTED CIRCUIT BOARDS
for discrete wiring applications



EMS manufactures a complete line of circuit boards for both wire wrapping and stitch wiring. Our Metric Series boards give high-speed circuit performance in the Eurocard format. The Metric Series offers a variety of sizes, with configurations for High-Speed Universal TTL, Schottky, and ECL technologies. In addition, EMS stocks boards for various bus systems including VME, Multibus, S-100, PC-bus, and Q-bus. (Refer to page 3 for engineering detail).

Our fully staffed engineering department can handle all your needs for custom board applications as well. In-house Computer Aided Design (CAD) gives us complete project control and reduces turn-around time.



CARD RACKS

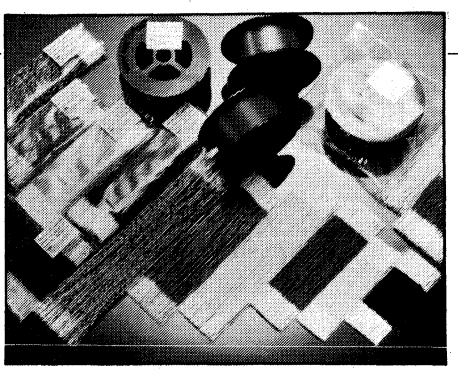
Ruggedized aluminum construction makes EMS printed circuit card racks ideal for heavy duty applications. A wide variety of vertical and horizontal racks are available in rack mount and freestanding configurations. Mixer racks allow the use of various sized cards in the same rack. Many models are available with side mount cooling fans for crossflow convection cooling. All material and workmanship is guaranteed.

BACKPLANES

EMS' high speed backplanes use 4 layer construction and massive inter-pin power and ground planes to optimize high speed performance. TTL, Schottky, and ECL backplanes have dedicated power and ground pins, while the High Speed Universal (HSU) design allows user dedication of all pins. EMS can supply custom backplanes to meet your specifications.

CUT AND STRIPPED WIRE-WRAPPING WIRE

Sizes ranging from 3.0″ to 25″ are in stock. Larger sizes are available on request, with one-day delivery. Other wire services offered include cutting and stripping customer-supplied wire, twisted pairs, trios, and 250′ and 500′ spools. We carry 30-, 28-, 26-, and 24-gauge Kynar in stock. Bulk wire is stocked. Call for quotation. The Mini Wire Bin, with 28 tubes holding 500 wires to 12½″, 250 wires from 13″ to 25″, provides low-cost storage. Bin kits for 30-, 28-, 26- and 24-gauge wire come fully loaded with various wire lengths. Send for our catalog.



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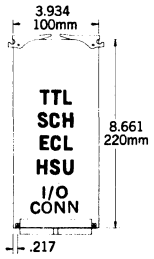
EMS THE METRIC SERIES®

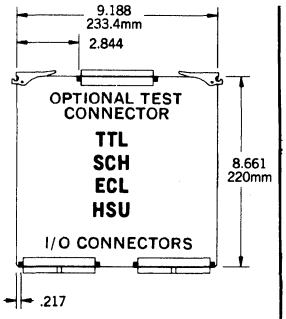
World Class Packaging System

24 Socket Pin PC Boards

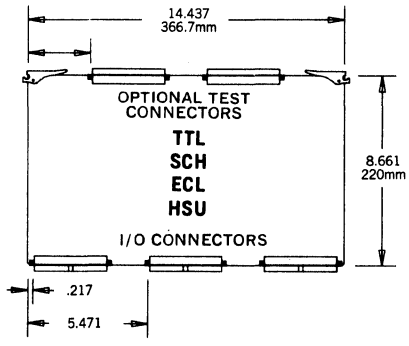
Model 11



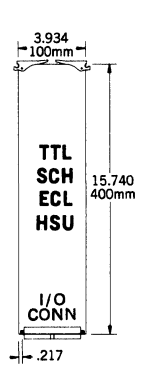
Model 21



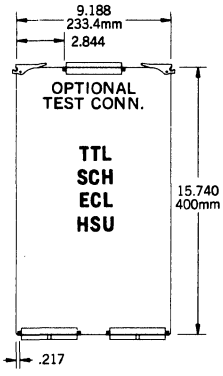
Model 31



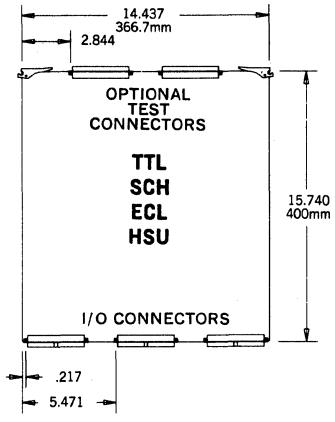
Model 12



Model 22



Model 32



24 Extender Cards

Ruggedly framed and supported extender card with 96 pin Reverse DIN connectors, 5-layers, 96 patched test points for each board size and logic option.

12 Backplanes

For .800″ or 1.200″ card centers. 96 pin Reverse DIN connectors, press-fit V&G wrap-pins. Massive power and ground planes. Wire wrap interconnections. TTL, Schottky, ECL and High-Speed Universal.

16 Card Racks

6 free standing and 6 Retma mount vertical racks for each size board .800″ and 1.200″ card spacing. 2 horizontal (free standing or Retma mount) racks for Model 32 boards, and mixer racks for different board sizes.

Two Pin Technologies

Stitch-Wire

MIL-approved wiring technique providing optimum performance for ECL and fast Schottky devices. Fast, easy and low cost changeability with the highest reliability of difusion bonding.

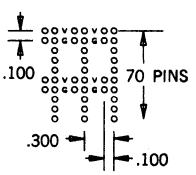
Wire-Wrap

Tin or gold plated 1 to 3 level wrap pins. Suitable for TTL and some Schottky applications.

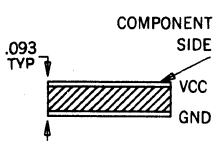
Design, Wiring Services and Equipment.

Logic conversion, Stitch-wiring, fully automatic and semi-automatic wiring. Numerically controlled and manually operated Stitch-Wire machine. Custom Board Design.

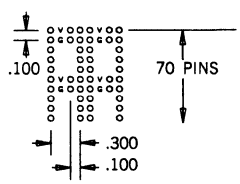
TTL 2-Layer Board
Typical TTL Pin Pattern



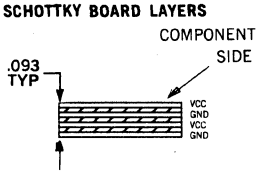
TTL BOARD LAYERS



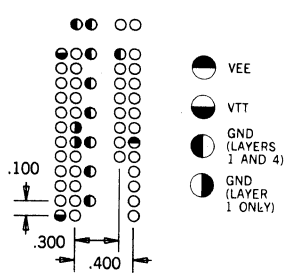
Schottky 4-Layer Board
Typical Schottky Pin Pattern



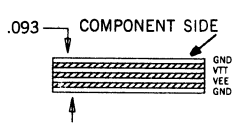
SCHOTTKY BOARD LAYERS



ECL 4-Layer Board
Typical ECL Pin Pattern

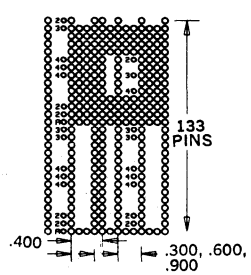


ECL BOARD LAYERS

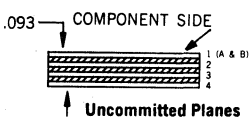


High-Speed Universal
HSU 4-Layer Board

TYPICAL HSU PIN PATTERN



HSU BOARD LAYERS



Uncommitted Planes

Allows mixing of TTL & ECL

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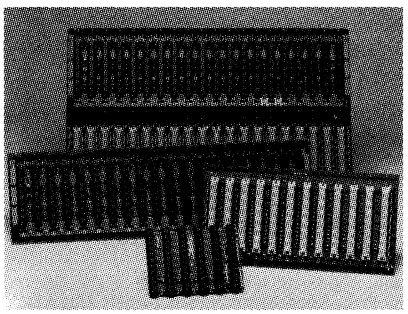
Whatever Your Bus Structure... MUPAC Should Be

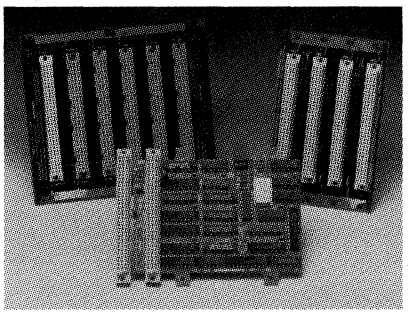
VMEbus



Mupac offers a wide range of VMEbus backplanes: J-1/J-2 monolithic backplanes featuring common groundplanes, J-1 3U backplanes, J-2 3U backplanes and VSB backplanes.

	Model Number	No. Positions
J-1/J-2 VMEbus BACKPLANES ONBOARD TERMINATION	CE05	5
	CE06	6
	CE07	7
	CE09	9
	CE12	12
	CE16	16
	CE20	20
INBOARD TERMINATION	CF03	3
	CF10	10
	CF21	21
J-1 VMEbus BACKPLANES ONBOARD TERMINATION	CA05	5
	CA06	6
	CA07	7
	CA09	9
	CA12	12
	CA16	16
	CA20	20
J-2 VMEbus BACKPLANES	CL05	5
	CL06	6
	CL07	7
	CL09	9
	CL12	12
VSB VMEbus BACKPLANES	CR02	2
	CR03	3
	CR04	4
	CR05	5
	CR06	6

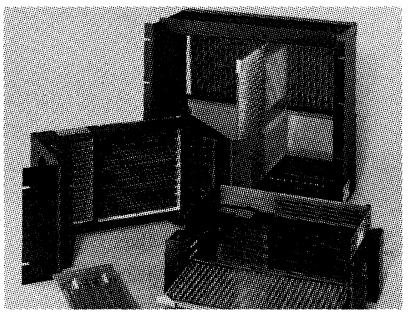
Multibus II™



Mupac, the leader in backplane technology, continues its high performance designs with the Multibus II backplane series. Mupac's AC series of iPSB backplanes are complete with an onboard central services module allowing access to slot 0 of the system. Mupac's AA and AB series offer high performance iPSB and iLBX compatibility.

	Model Number	No. Positions
iPSB MULTIBUS II W/CSM	AC05	5
	AC06	6
	AC07	7
	AC09	9
	AC12	12
	AC16	16
	AC19	19
	AC20	20
iPSB MULTIBUS II	AA05	5
	AA06	6
	AA07	7
	AA09	9
	AA12	12
	AA16	16
	AA19	19
	AA20	20
iLBX MULTIBUS II	AB02	2
	AB03	3
	AB04	4
	AB05	5
	AB06	6

Multibus™



Mupac offers the widest range of Multibus systems packaging products available in the market. Offering 2-sided, 4-layer, and a new 6-layer design, Mupac is sure to have the backplane to fulfill your application.

MULTIBUS BACKPLANES

Model Number	No. Positions	Slot Spacing
3052522-01	4	.6
3052521-01	5	.6
3052520-01	6	.6
3052517-01	9	.6
3052514-01	12	.6
3053511-01	15	.6
3051911-01*	15	.6
3053500-01	26	.6
3051900-01*	26	.6
3052221-01	5	.75
3052219-01	7	.75
3052214-01	12	.75
3058520-01**	6	.6
3058516-01**	10	.6
3058514-01**	12	.6
3058500-01**	26	.6
3058319-01**	7	.75
3058305-01**	21	.75

* Vertical Mounting
**Six-Layer Backplanes

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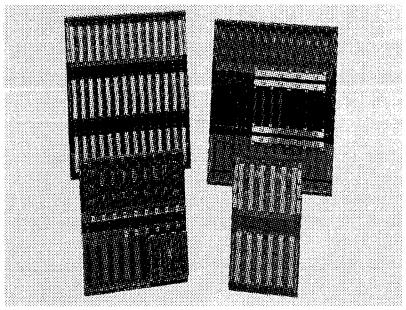
SUNbus is a registered trademark of Sun Microsystems Inc.

Your No.1 Choice

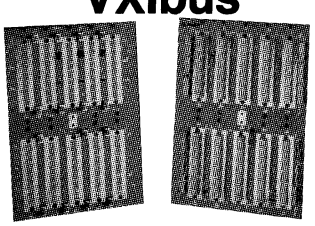
SUNbus™



Mupac offers two product families of Sun compatible backplanes. The EE/EF J-1/J-2 backplanes feature a VME based J-1 with rows A & C bussed on J-2 per Sun spcifications. The EA series backplanes are a triple high J-1/J-2/J-3 design.

	Model Number	No. Positions
J-1/J-2 SUN BACKPLANES ONBOARD TERMINATION	EE05	5
	EE06	6
	EE07	7
	EE09	9
	EE12	12
	EE16	16
	EE20	20
INBOARD TERMINATION	EF03	3
	EF10	10
	EF21	21
J-1/J-2/J-3 SUN BACKPLANES ONBOARD TERMINATION	EA06	6
	EA08	9
	EA14	14
	EA20	20

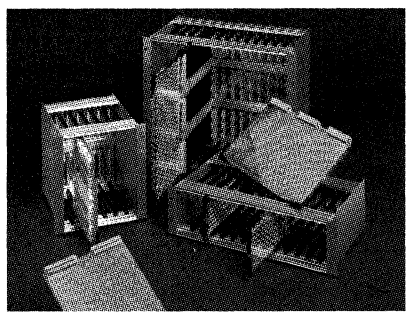
VXIbus



Mupac offers full support to the VXIbus with two product families, a J-1/J-2 6U backplane family and a J-1/J-2/J-3 9U backplane family.

	Model Number	No. Positions
J-1/J-2 VXI BACKPLANES	GC05	5
	GC08	8
	GC13	13
J-1/J-2/J-3 VXI BACKPLANES	GE13	13

96-PIN DIN/IEC

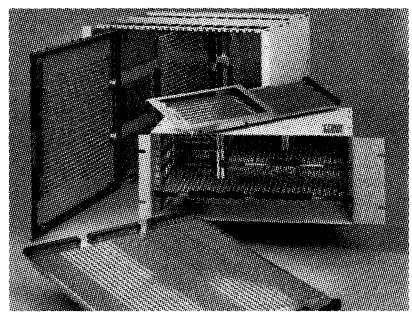


Mupac is highly responsive to your 96-pin DIN/IEC compatible packaging hardware needs. Requirements for functionality, speed, and performance in a modular packaging system are combined with Mupac's advanced manufacturing procedures to produce Mupac Metric; the 96-pin DIN/IEC compatible standard packaging hardware that works together as one integrated solution to your IC packaging requirements.

Mupac's comprehensive family of standard packaging hardware includes subracks and power backplanes that can handle up to 26 boards in depths that go from 160mm to 400mm and range in height from 3U to 12U in easy-to-use modular increments.

Our Metric wire wrap boards feature Mupac's patented 4-layer Schottky construction. This design maximizes the conductivity and capacitance characteristics of the board, which are the power source and ground reference of the high speed ICs, while minimizing the effects of system noise, ringing, and propagational delay.

Standard 108-PIN



Mupac offers a versatile range of standard packaging building blocks that enable you to translate your designs into full prototypes and complete systems faster and with fewer restrictions than any other product on the market today. It's Mupac's system approach to packaging your system and it's complete down to the smallest detail.

Mupac's comprehensive family of high speed packaging hardware includes horizontal and vertical racks, 4-layer Schottky wire wrap boards, power backplanes, mounting hardware, cable assemblies, connectors, and other accessories.

Our system allows you to package as little as one single 108-pin connector size Schottky wire wrap board that measures 4.5" × 8.125" to as many as thirteen 347 series high density wire wrap boards that measure 14.9" × 16.125" and hold as many as 480 IC's each based on 16-pin devices.

Mupac's patented Schottky compatible boards are designed to maximize the conductivity and capacitance characteristics of the board, minimize system noise, ringing and propagational delay, and enhance the rise and fall times of the signal.

We're Committed—

Mupac is committed to being the world leader in high performance backplanes and system packaging products. As part of this commitment, we will be at the forefront supporting new emerging bus platforms with backplanes as well as complimentary packaging products including our standard and custom enclosures complete with subrack, backplane, power, and cooling.

MUPAC Packaging Systems

Mupac Corporation
A Carlo Gavazzi Company
10 Mupac Drive, Brockton, MA 02401
Tel (508) 588-6110 • Outside MA 1-800-225-0398
FAX (508)588-0498

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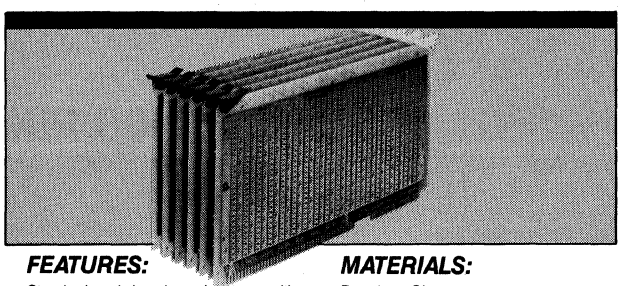
MULTIBUS



FEATURES:

Standard cards in universal patterns with columns on .3" centers accept dip sockets and other devices with between row spacing of .3", .6", or .9".

Available in a variety of I/O, including connectors and card edge fingers.

High density Universal card accepts up to 150/16-pin dip sockets and devices with between row spacing of ,3", .4", .5", .6", .7", and .8".

Panel thickness is 1/16".

Tapered-entry screw-machine contacts are available with 1, 2, or 3-level wire-wrap tails.

Panels are normally supplied with sleeves in external V & G positions.

MATERIALS:

Board: Glass epoxy, 2 oz. copper per side, 60/40 tin-lead plated.

Two-piece, socket terminal.

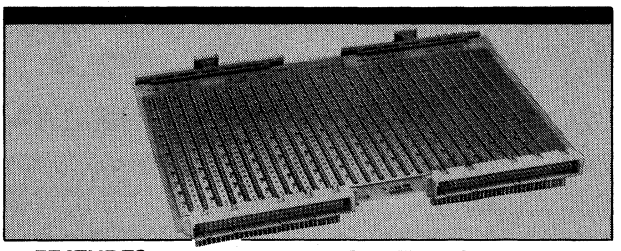
Inner contact: Beryllium copper, gold-over-nickel plating.

Outer sleeve: Brass with gold or tin-over-nickel plating.

Custom designs or modifications are available upon request.

No minimum requirements.

EUROCARD DIN Standards



FEATURES:

Compatible with VME Bus.

Logic patterns accept 14 or 16-pin dip devices on .3" centers with either internal or external volt and ground commitments.

Universal pattern with columns on .3" centers accepts devices on .3", .6", and .9" centers.

Also available in a high-density Universal pattern layout that will handle 8 thru 64-pin IC's and devices on .3", .6", and .9" centers.

Panel thickness is 1/16".

Tapered-entry screw-machine contacts are available with 1, 2, or 3-level wire-wrap tails.

Panels are normally supplied with sleeves in external V & G positions.

Optional pull handles with holes to probe test points.

Optional EURO-CARD type wire-wrap connectors in either 64 or 96-pin configurations.

MATERIALS:

Board: Glass epoxy, 2 oz. copper per side, 60/40 tin-lead plated.

Two-piece, socket terminal.

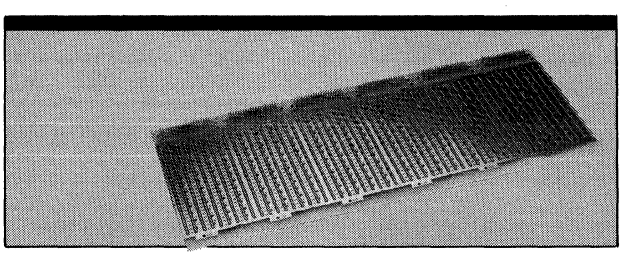
Inner contact: Beryllium copper, gold-over-nickel plating.

Outer sleeve: Brass with gold or tin-over-nickel plating.

Custom designs or modifications are available upon request.

No minimum requirements.

MODULAR PANELS



FEATURES:

Patterned panels have thirty positions per section. Universal panels have nine rows per section.

Available in 1 thru 6 groups or sections.

Available with patterns which accept 14 or 16-pin dip packages on .300" centers and a Universal pattern which will accept dip packages on .300" and .600" centers.

14 and 16-pin pattern panels are available with either external or internal voltage and ground connections.

Choice of four different I/O styles

Panel thickness is .125".

Also available in multi-layer configurations.

Tapered-entry screw-machine contacts are available with 1, 2, or 3-level wire-wrap tails.

Panels are normally supplied with sleeves in external V & G positions.

MATERIALS:

Board: Glass epoxy, 2 oz. copper per side, 60/40 tin-lead plated.

Two-piece, socket terminal.

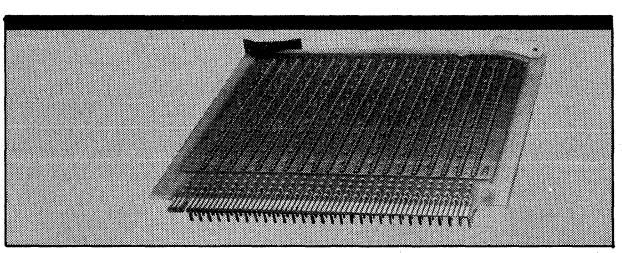
Inner contact: Beryllium copper, gold-over-nickel plating.

Outer sleeve: Brass with gold or tin-over-nickel plating.

Custom designs or modifications are available upon request.

No minimum requirements.

EDGE CONNECTOR TYPE



FEATURES:

Available with 60 IC patterns which accept 14 or 16-pin dip packages, or 48 patterns which accept 20-pin dip packages on .300" centers.

14, 16, and 20-pin pattern panels are available with either external or internal voltage and ground connections.

Universal pattern panels are also available which accept dip packages on .300" and .600" centers.

I/O area is 120 contacts, (60 dual row) with gold plating. Available in both a committed and non-committed configuration.

Panel thickness is both .062" and .125".

Also available in multi-layer configurations.

Associated card racks and back panels are available.

Tapered-entry screw-machine contacts are available with 1, 2, or 3-level wire-wrap tails.

Panels are normally supplied with sleeves in external V & G positions.

MATERIALS:

Board: Glass epoxy, 2 oz. copper per side, 60/40 tin-lead plated.

Two-piece, socket terminal.

Inner contact: Beryllium copper, gold-over-nickel plating.

Outer sleeve: Brass with gold or tin-over-nickel plating.

Custom designs or modifications are available upon request.

No minimum requirements.

PRECICONTACT, INC., 835 WHEELER WAY, P.O. BOX 798, LANGHORNE, PA 19047. 215-757-1202. TELEX: 83-4253. FAX: 215-757-8025.

PTI PRODUCT TECHNOLOGY INC.
2811-B McGAW AVE., IRVINE, CA 92714
PHONE: (714) 474-8998
FAX: (714) 474-1340

"SERVICE IS OUR SPECIALTY"

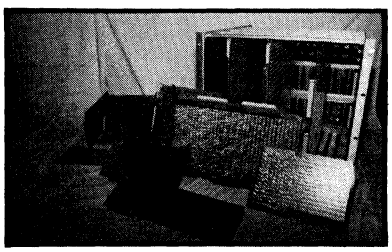
Product Technology supplies the highest quality products consistent with our customers' workmanship standards and cost requirements.

DISCRETE WIRING SERVICES

Automatic and semiautomatic wire wrapping and stitch-wiring — point-to-point, XY and special routing.

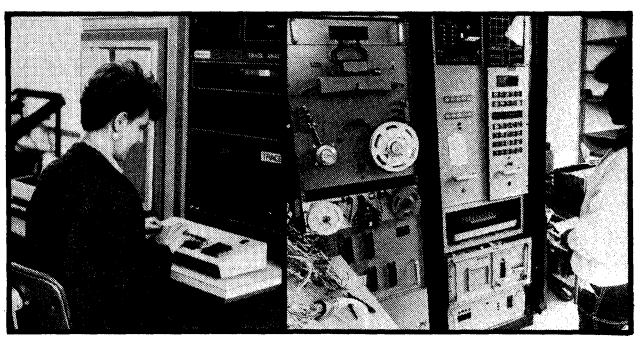
ELECTRONIC PACKAGING PRODUCTS

Logic cards, backplanes, extender cards, racks — DIN/EUROCARD, VME, Multibus, custom PC boards, hardware and wire (cut and stripped).



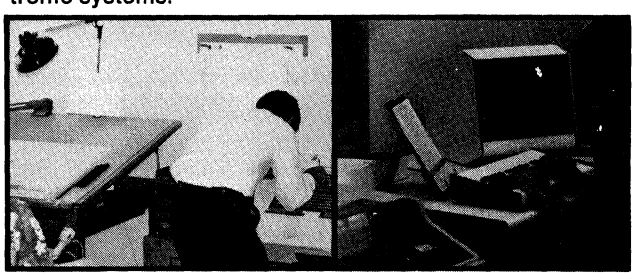
TESTING SERVICES

Bare board and in-circuit fixtures.

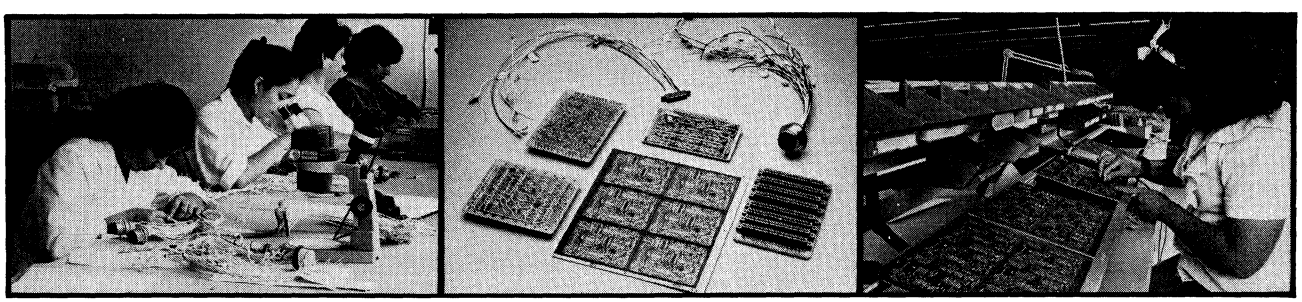


ENGINEERING SERVICES

PC board design (CAD), digitizing, photoplotting, data conversion, design analysis and documentation packages. PC boards, cables, harnesses and complete electronic systems.



ASSEMBLY SERVICES



QUALIFICATIONS

MIL-I-45208	QUALITY
MIL-S-45743	SOLDER
WS 6536	SOLDER
WS 14783	STITCH WIRE
MIL-STD-1130B	WIRE WRAP
DOD-HDBK-263	ELECTROSTATIC DISCH. CONTR.
MIL-STD-454	ELECTRONIC ASSEMBLY
MIL-STD-2000	ELECTRONIC ASSEMBLY

SERVICES AVAILABLE

- AUTOMATED WIREWRAPPING AND STITCH-WIRE SERVICES
- ELECTRO/MECHANICAL ASSEMBLY SERVICES CHASSIS-POWER SUPPLIES, PRINTED CIRCUIT BOARDS, CABLES, HARNESSES
- TESTING SERVICES IN-CIRCUIT ANALOG, CONTINUITY AND DISCONTINUITY

Product Technology would welcome the opportunity to conduct you on a tour of our facilities to demonstrate that our equipment, controls and capabilities are second to none.

MAJOR EQUIPMENT INCLUDES

- GARDNER DENVER FULLY AUTOMATIC WIRE WRAP MACHINES
- GARDNER DENVER, STANDARD LOGIC SEMIAUTOMATIC WIRE WRAP MACHINES
- CNC 85 SEMIAUTOMATIC STITCHWIRE MACHINES
- GARDNER DENVER 14Y CUT AND STRIP MACHINES
- TRACE TA-5 TEST SYSTEM
- ATS 300 IN-CIRCUIT BOARD TESTER
- HUGHES FACT TESTER
- 18″ HOLLIS WAVE SOLDER MACHINES
- TRIEBER AQUEOUS "IN LINE" CLEANING SYSTEM
- AUTOMATIC LEAD CUTTERS 12″ AND 18″
- MARK V AUTOMATIC LEAD PREPPERS
- MARK II WIRE CUTTERS

Tech-Etch Power Distribution Systems

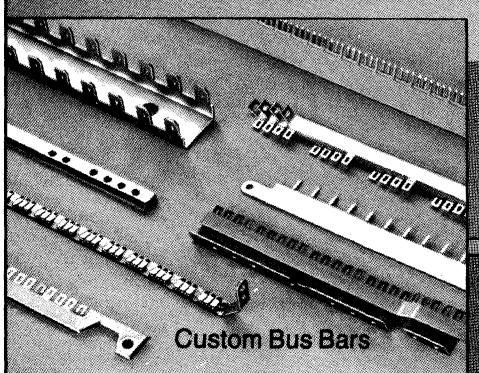
- Corrosion resistant
- Tinned copper ends
- UL rated 94V-0
- Rolled annealed copper for maximum flexibility
- Mylar* insulation

* Registered trademark of Du Pont

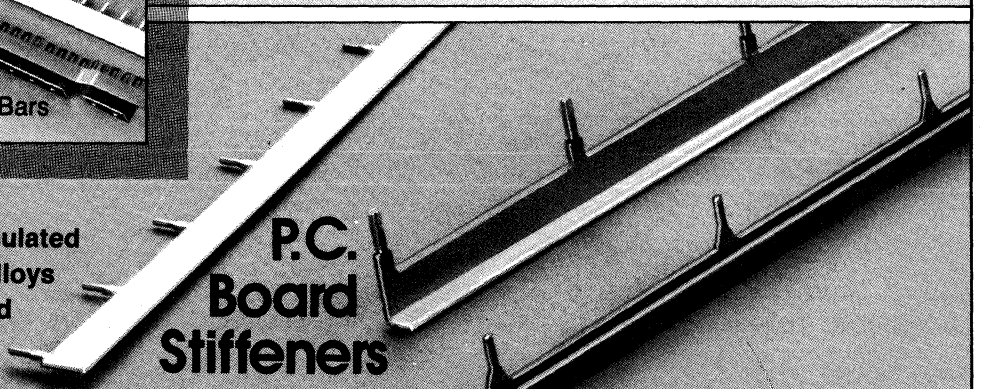
Flexible Insulated Ground Straps

The Tech-Etch Bus Bar Division is a leading manufacturer of high quality insulated ground straps, offering low cost, easy-to-use solutions to your ESD and grounding needs. A wide variety of standard sizes and configurations as well as custom designs are available in prototype to high production quantities. No matter how complex your requirements, our experienced sales engineering and marketing staff makes sure your specifications are understood and precisely met.

A new Insulated Ground Strap Data Sheet provides complete specifications and technical information. Call or write today for your copy and the name of our specialist serving your area.



Custom Bus Bars



- Insulated or uninsulated
- Brass or copper alloys
- Plating as required
- May be used for carrying current
- Provide board level shielding for sensitive components
- Any pin spacing in .100 increments
- Clinched or soldered in place

P.C. Board Stiffeners

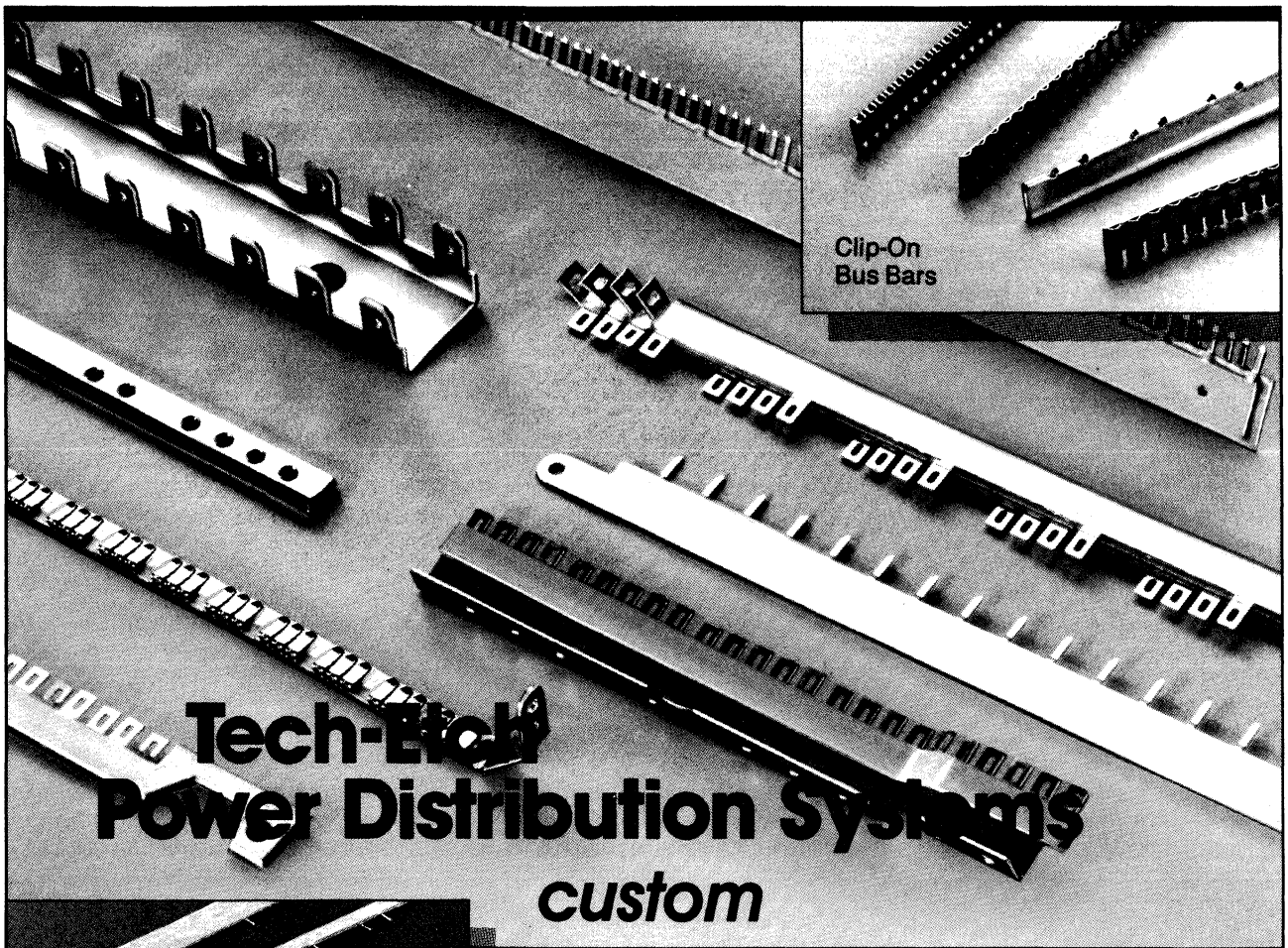
The Tech-Etch Bus Bar Division, leading manufacturer of standard and custom power distribution systems, and board stiffeners, offers low cost and performance advantages over alternative methods.

A wide variety of sizes and configurations as well as special designs are available in prototype to high production quantities. Our experienced sales engineering and marketing staff ensures your specifications are precisely met, no matter how complex your requirements.

A new catalog provides complete specifications and technical information. Call or write today for your copy and the name of our specialist serving your area.

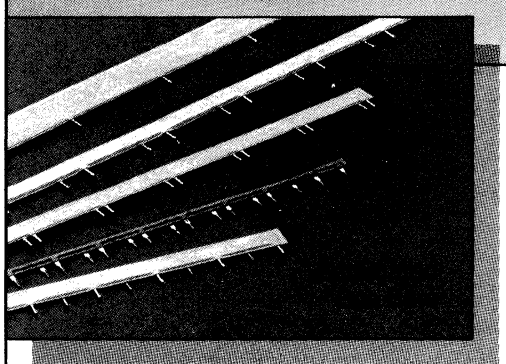
Tech-Etch

Tech-Etch, Inc., 45 Aldrin Road, Plymouth, MA 02360 • 508-747-0300 • FAX 508-746-9639
Tech-Etch, Inc., Bus Bar Div., 16918 So. Gramercy Pl., Gardena, CA 90247 • 213-770-8150 • FAX 213-719-1377



Tech-Etch Power Distribution Systems

custom and standard



- **Current capacity to 300 amps**
- **Powder coating**
- **Copper, beryllium copper aluminum**
- **Plated to exact specifications**
- **Kapton, Nomex and *Mylar dielectrics**
- **Multilayer**

* Registered trademark of Du Pont

Standard Laminated Bus Bars and Clip-On Bus Bars Quickly Available for Non-Special Power Distribution Requirements

The Tech-Etch Bus Bar Division is a leading manufacturer of standard and custom power distribution systems. Complete machining, stamping, photo-etching and laminating capabilities ensure prompt, cost-effective solutions to your requirements. No matter how complex your needs, our experienced engineers and marketing staff will make sure your specifications are understood and precisely met.

Our new Bus Bars Catalog provides complete specifications and technical information. Call or write today for your copy and the name of our specialist serving your area.

Tech-Etch

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Tech-Etch, Inc., Bus Bar Div., 16918 So. Gramercy Pl., Gardena, CA 90247 • 213-770-8150 • FAX 213-719-1377

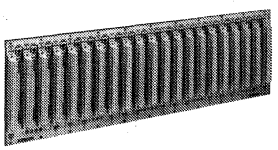
VECTOR ELECTRONIC COMPANY

VECTOR ELECTRONIC COMPANY, 12460 Gladstone Ave., Sylmar, CA 91392-9208
Phone 818-365-9661, FAX: 818-365-5718 Call Toll Free in CA 800-426-4652,
Outside CA 800-423-5659 (For custom configurations contact factory directly.)

Vectorbord® Backplanes

- Uncommitted
- VME
- Multibus
- S100
- STD Bus

Uncommitted Backplanes



Multilayer construction and massive, three ounce copper voltage and ground planes for high performance applications. Four independent power layers, one can be split between AUX A and AUX B, for extremely low impedance power distribution. All connector pins are isolated from power layers and from other pins; pins are assigned by user for maximum flexibility. Off-board termination (modules available separately) can be used for termination according to VME J1 or J2 specifications.

Positions provided for decoupling capacitors, power to ground and ground to chassis. I/O connector mounting areas provided adjacent to A and C rows of each slot.

Ordering Options:

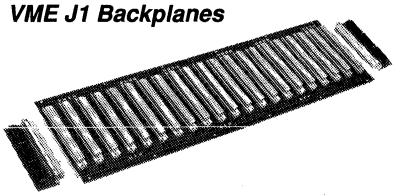
• Power connectors: Power Bugs, Mate-N-Lok®, both, or none.

• Power Pick-up Pins: gold-plated Wire Wrap pins installed at factory, or no pins installed.

VME Backplanes

Fully assembled and tested, VME Backplanes include pressfit, 96-pin female DIN connectors spaced at 0.8" centers. Recommended for use with Vector Europackaging subracks. Contact factory for custom configurations.

VME J1 Backplanes



Six-layer construction, controlled impedance design, for integrity and reliability. Massive copperclad power and ground planes on opposite board sides; patented shielding technique effectively blocks both capacitive and inductive coupling.

Off-board termination, modules supplied. Standard +5V and GND access provided through Mate-N-Lok® connectors (mating connector housings and pins supplied). Extensive labelling on board identifies IACK and IACK OUT pins and other information.

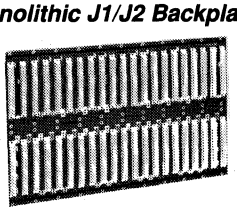
VME J2 Backplanes

Featuring off-board termination (modules supplied). Available in sizes corresponding to available J1 backplanes.

VMX Backplanes

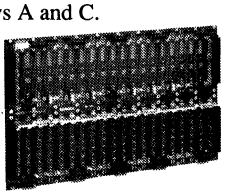
Multilayer construction, VMX backplanes provide pin assignments for A and C connector rows according to VMX specs. With power connectors on-board, VMX backplanes can stand alone in Vector subracks.

VME Monolithic J1/J2 Backplanes



Eight-layer monolithic (J1 and J2 combined) backplanes handle massive power and speed requirements. Ground layers separate signal and power layers, effective preventing crosstalk between signals and power plane.

Featuring on-board termination, Molex® connector for access to SYSRESET, SYSFAIL, and ACFAIL lines; positions for decoupling capacitors (power to circuit ground and circuit ground to chassis) for maximum protection against resonance and crosstalk; mounting areas adjacent to J1 connectors for I/O to J2; and I/O mounting areas (ribbon cable) adjacent to J2 rows A and C.

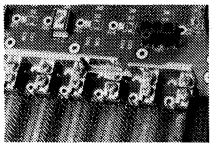


Several Ordering Options:

• Power connectors: Power Bugs, Mate-N-Lok®, both, or none.

• J1 I/O connectors: with gold-plated, double-tailed Wire Wrap pins installed, or no pins installed.

• Decoupling capacitors: power to ground only, ground to chassis only, both, or none.



Massive power Bus Bar (Part No. BB21S, available separately) can be used with Power Bugs for excellent power distribution and greatly simplified power hook-up.

Vector Backplanes also are available mounted into Vector Card Cage assemblies, see EEM Volume C, Section 1400: Cabinets, Enclosures, Racks, and Chassis.

Vector Backplanes

Part No.	Contacts	Spacing	Height	Width	Layers/Material
VMEBP21J1	21 Slot J1 Backplane	0.80"	5.12"	16.74"	6 VME
VMEBP20J1	20 Slot J1 Backplane	0.80"	5.12"	15.94"	6 VME
VMEBP14J1	14 Slot J1 Backplane	0.80"	5.12"	11.14"	6 VME
VMEBP12J1	12 Slot J1 Backplane	0.80"	5.12"	9.54"	6 VME
VMEBP10J1	10 Slot J1 Backplane	0.80"	5.12"	7.94"	6 VME
VMEBP9J1	9 Slot J2 Backplane	0.80"	5.12	7.14"	6 VME
VMEBP8J1	8 Sot J1 Backplane	0.80"	5.12"	6.34"	6 VME
VMEBP7J1	7 Slot J1 Backplane	0.80"	5.12"	5.54"	6 VME
VMEBP6J1	6 Slot J1 Backplane	0.80"	5.12"	3.94"	6 VME
VMEBP5J1	5 Slot J1 Backplane	0.80"	5.12"	3.94"	6 VME
VMEBP2J1	2 Slot J1 Interconnect Board	0.80"	5.12"	1.55"	6 VME
VMEBP21J2	21 Slot J2 Backplane	0.80"	5.12"	16.74"	2 VME
VMEBP20J2	20 Slot J2 Backplane	0.80"	5.12"	15.94"	2 VME
VMEBP14J2	14 Slot J2 Backplane	0.80"	5.12"	11.14"	2 VME
VMEBP12J2	12 Slot J2 Backplane	0.80"	5.12"	9.54"	2 VME
VMEBP10J2	10 Slot J2 Backplane	0.80"	5.12"	7.94"	2 VME
VMEBP9J2	9 Slot J2 Backplane	0.80"	5.12"	7.14"	2 VME
VMEBP8J2	8 Slot J2Backplane	0.80"	5.12"	6.34"	2 VME
VMEFP7J2	7 Slot J2 Backplane	0.80"	5.12"	5.34"	2 VME
VMEBP6J2	6 Slot J2 Backplane	0.80"	5.12"	4.74"	2 VME
VMEBP5J2	5 Slot J2 Backplane	0.80"	5.12"	3.94"	2 VME
VMEBP2J2	2 Slot J2 Interconnect Board	0.80"	5.12"	1.55"	2 VME
UM21A3U00	21 Slot Uncommitted	0.80"	5.063"	16.74"	21 Uncommitted
UM21A3U20	21 Slot Uncommitted, Power Bugs	0.80"	5.063"	16.74"	21 Uncommitted, Power Bugs
VMX-4-01	4 Slot VMX	0.80"	5.12"	3.14"	4 VMX
VMX-6-01	6 Slot VMX	0.80"	5.12"	4.74"	4 VMX
VMEBP21-M00	21 Slot Monolithic	0.80"	10.37"	16.74"	8 VME
VMEBP10-M00	10 Slot monolithic	0.80"	10.37"	7.94'	8 VME
VMEBP7-M00	7 slot Monolithic	0.80"	10.37"	6.34"	8 VME
4608-4-1	4 Slot Multibus	0.60"	3.33"	12.52"	Multibus
4610-8-1A	8 Slot STD Bus	0.75"	4.35"	7.0"	STD Bus
4610-16-1A	16 Slot STD Bus	0.75"	4.35"	13.0"	STD Bus
8803-6-1A	6 Slot SI00	0.75"	6.50"	9.0"	S100 Bus
8803-12-1A	12 Slot S100	0.75"	9.0"	11.125"	S100 Bus
8803-18-1A	18 Slot S100	0.75"	9.0"	15.55"	S100 Bus

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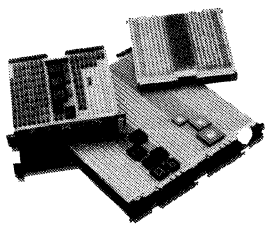
Outside CA 800-423-5659 (For custom configurations contact factory directly.)

VECTORBORD plus™ Wire Wrap Prototyping Boards

High Performance Prototyping Boards – The Easiest Route From Drawing Board (or CRT) To Finished Circuit



0.055" diameter holes on 0.1" grids. High speed, high density multilayer boards – available in standard DIN sizes with a wide range of options to meet your needs:

- Four finger pins (standard) in DIP IC mounting areas; six finger pins (low insertion force) in PGA mounting areas
- Socket Pins and V/G Terminals are factory installed
- Surface Mounted Decoupling Capacitors (factory installed)
- High density socket pin configurations with large grid array mounting area
- High density grid allows minimum wire lengths for maximum performance
- Massive copper planes on multiple layers provide minimum current return paths and reduce ringing and crosstalk
- Two circuit patterns: Schottky (SCH) and High Speed Universal
- The Schottky (SCH) family, with redundant power and ground layers, is ideal for various integrated circuits, such as Schottky and CMOS, operating at or above 20 MHZ
- High Speed Universal (HSU) boards feature four independent layers – for greater speeds, HSU versions meet specifications for ECL (Emitter Coupled Logic), and can be used to mix different types of integrated circuits (such as ECL, TTL and analog) within the same package
- Accepts DIP devices with 0.300", 0.400", 0.500", 0.600", 0.900" and 1.200" lead spacings without adapters.
- For Wire Wrap or Stitch Wire applications
- Available uncommitted or with connector committments for VMEbus, Multibus II, Futurebus and Nubus
- Compatible with DIN and IEC international standards.
- 0.125" epoxy glass, flame-retardant construction (edges milled to 0.062")
- Supported by a complete line of Europackaging Products: including backplanes, subracks, extender cards and accessories.
- Boards are 0.125" thick with 0.062" milled edges

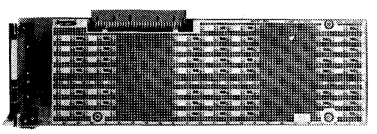
Vectorbord plus™ DIN-Based Prototyping Boards

Part No.	Width	Height	Hole Dia.	16 Pin DIP Capacity	Recommended Card Cage
LF316UC3T1	6.3	3.94	0.055	49	CCK160-3U
LF322SC3T1	8.66	3.94	0.055	81	CCK220-3U
LF328SC3T1	11.02	3.94	0.055	100	CCK280-6U
LF328UC3T1	11.02	3.94	0.055	100	CCK280-6U
LF616SC3T1	6.3	9.19	0.055	120	CCK160-6U
LF616UC3T1	6.3	9.19	0.055	120	CCK160-6U
LF622SC3T1	8.66	9.19	0.055	198	CCK220-6U
LF622UC3T1	8.66	9.19	0.055	198	CCK220-6U
LF628SC3T1	11.02	9.19	0.055	242	CCK280-6U
LF628UC3T1	11.02	9.19	0.055	242	CCK280-6U
LF640SC3T1	15.75	9.19	0.055	374	CCK400-6U
LF640UC3T1	15.75	9.19	0.055	374	CCK400-6U
LF922UC3T1	8.66	14.44	0.055	306	CCK220-9U
LF922SC3T1	8.66	14.44	0.055	306	CCK220-9U
LF928SC3T1	11.02	14.44	0.055	400	CCK280-9U
LF928UC3T1	11.02	14.44	0.055	400	CCK280-9U
LF940SC3T1	15.75	14.44	0.055	578	CCK400-9U
LF940UC3T1	15.75	14.44	0.055	578	CCK400-9U

Note: All Boards are made with FR4 Epoxy Glass and have a 96-Pin DIN Connector Installed

Vectorbord plus™ for IBM® and Macintosh®

Designed for socket pins, ideal for wire wrap applications. Available for IBM PC and PS/2 families and for Macintosh II. Boards feature full voltage and ground planes; high density grids; and provisions for mounting SMD caps. Large PGA areas accept any size PGA or PLCC device.



Socket pins and SMD caps installed on some boards. I/O areas for D-subminiature and ribbon header connectors. Mounting brackets and hardware included.

Vectorbord plus™ IBM® and Macintosh®

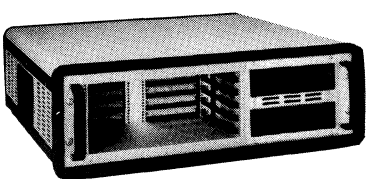
Part No.	Width	Height	Hole Dia.	16 Pin DIP Capacity	Bus	Recommended Card Cage
4613-5	13.25	4.2	0.055	120	PC/XT	CCK160-3U
4613C5LF	13.25	4.2	0.055	120	PC/XT	CCK220-3U
4617-5	13.25	4.8	0.055	140	PC AT	CCK280-6U
4617C5LF	13.25	4.8	0.055	140	PC AT	CCK280-6U
4618-5	11.5	3.48	0.055	79	PS/2	CCK160-6U
4618C5LF	11.5	3.48	0.055	79	PS/2	CCK160-6U
5085-5	4.0	12.85	0.055	115	MAC II	CCK220-6U
5085C5LF	4.0	12.85	0.055	115	MAC II	CCK220-6U

Note: Socket Pins and V/G Terminals are Factory Installed

System Subrack Assemblies Enclosures

All System Assemblies are based on Vectors 19" Card Cage – any part or component can be modified per special order.

Ruggedly handsome, sturdily built –Vector System Subrack Assemblies with Enclosures are appropriate on worktables and desktops. Supplied fully assembled with power supply, subrack, fans, and backplane(s). Several backplane options: 8-layer monolithic backplane with on-board termination (combines J1 and J2), 6-layer J1, and 4-layer J2. J1 and J2 backplanes provide off-board termination. Power supplies matched to system requirements, filtered air flow for thermal efficiency. Backplanes and card cages are completely removeable for service. System enclosures available in grey/grey or burgundy/grey finishes. System Subracks Assemblies also available without enclosures. All parts and components can be ordered separately.



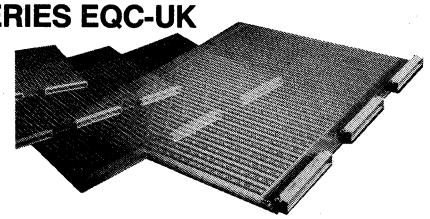
VME Systems Enlcosures

Note: All units are 10.1" deep

Part Number	Description	Height	Depth
SE2322A-01 (burgundy/grey)	5 slot 8U enclosure with 5 slot J1 and 5 slot J2 backplanes. Holds 5-6U x 160mm cards horizontally mounted. 175 watt switching power supply.	6.4"	20.2"
SE2323B-01 (grey/grey)	Same as above	6.4"	20.2"
SE2772A-01 (burgundy/grey)	21 slot 6U enclosure with 21 slot monolithic combined J1 and J2 backplane. Holds 21-6U x 160mm cards vertically mounted. 450 watt switching power supply.	13.4"	20.2"
SE2722B-01 (grey/grey)	Same as above	13.4"	20.2"

DAGE PRECISION INDUSTRIES
46701 FREMONT BLVD., FREEMONT, CA 94538
TELEPHONE: (415) 683-3930

NEW FORMAT EUROCARDS, SERIES EQC-UK



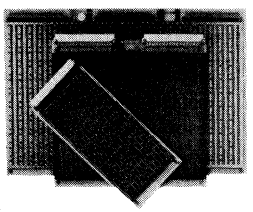
- I/O Connector positions at front and rear.
- Fully gridded OV and +5V planes for high speed, low noise applications.
- Maximum density decoupling and power distribution positions (as illustrated below).

ORDERING INFORMATION

Blank Boards for User Assembly

EQC-UK1A	Single Eurocard, 100 × 160mm
EQC-UK1XA	Single Extended Eurocard, 100 × 220mm
EQC-UK2A	Double Eurocard, 233.35 × 160mm
EQC-UK2XA	Double Extended Eurocard, 233.35 × 220mm
EQC-UK2XSA	Double Super Extended Eurocard, 233.35 × 250mm
EQC-UK2XHA	Double Hyper Extended Eurocard, 233.35 × 280mm
EQC-UK3XA	Triple Extended Eurocard, 366.75 × 220mm
EQC-UK3XSA	Triple Super Extended Eurocard, 366.75 × 250mm
EQC-UK3XHA	Triple Hyper Extended Eurocard, 366.75 × 280mm

EUROCARDS SERIES EQC-UN



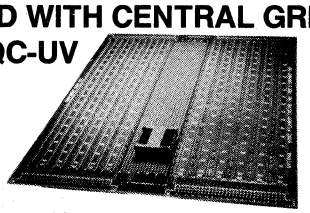
- The original Eurocard design.
- I/O Connector position at front, grid area at the back for auxiliary connection.
- Full gridded OV and +5V planes for high speed, low noise applications.

ORDERING INFORMATION

Blank Boards for User Assembly

EQC-UN1A	Single Eurocard, 100 × 160mm
EQC-UN1XA	Single Extended Eurocard, 100 × 220mm
EQC-UN2A	Double Eurocard, 233.35 × 160mm
EQC-UN2XA	Double Extended Eurocard, 233.35 × 220mm
EQC-UN2XSA	Double Super Extended Eurocard, 233.35 × 250mm
EQC-UN2XHA	Double Hyper Extended Eurocard, 233.35 × 280mm
EQC-UN3XA	Triple Extended Eurocard, 366.75 × 220mm
EQC-UN3XSA	Triple Super Extended Eurocard, 366.75 × 250mm
EQC-UN3XHA	Triple Hyper Extended Eurocard, 366.75 × 280mm

EUROCARD WITH CENTRAL GRID AREA, SERIES EQC-UV



- Central area reserved for non dual-in-line devices e.g. PGAs, LCCs, discretes, etc.
- I/O connector positions at front and rear.
- Fully gridded OV and +5V planes for high speed, low noise applications.
- Maximum density de-coupling and power distribution positions.

EQC UV is a Quick/Connect board specifically designed to deal with the problems of mounting Pin Grid Arrays and other non dual-in-line devices, and for boards with large amounts of analogue circuitry. Whilst the majority of the board area is populated in our standard pattern for dual-in-line devices, a central section has been pre-drilled on 100″ grid, 16 × 92 holes, to accept individual sockets QC-5068-175 installed by the user. In this way, devices can be accommodated where needed, and quickly connected using standard Quick/Connect tools.

EQC-UV2	Double Eurocard
EQC-UV2XHA	Hyper-extended double Eurocard.
EQC-UV3XHA	Hyper-extended triple Eurocard.

Other boards available on request.

OPTIONS, ACCESSORIES AND SPECIFICATIONS SERIES EQC-UK, EQC-UN AND EQC-UV

Options (Suffix)

-T	Board assembled with tin plated sockets and terminals.
-G	Board assembled with gold plated sockets and terminals.
-T64B	as above, tin-plated components plus 64 pin "B" Body connectors.
-G64B	as above, gold-plated components plus 64 pin "B" Body connectors.
-T64C	as above, tin-plated components plus 64 pin "C" Body connectors.
-G64C	as above, gold-plated components plus 64 pin "C" Body connectors.
-T96C	as above, tin-plated components plus 96 pin "C" Body connectors.
-G96C	as above, gold-plated components plus 96 pin "C" Body connectors.

Accessories (Suffix)

-DRG A	Transparent Master for circuit layout and wiring list preparation.
-DRG B	Dyeline print for circuit layout, etc.
-BBS	Backup Board for use in assembling board with contacts.

Specifications

Material:	1.6mm FR4 glass epoxy, finished copper. 70 microns.
Finish:	Green Solder Resist XZ-15 over Tin/Lead Reflow, 2 sides.
Component Identification:	High Contrast white or yellow legend. 2 sides.

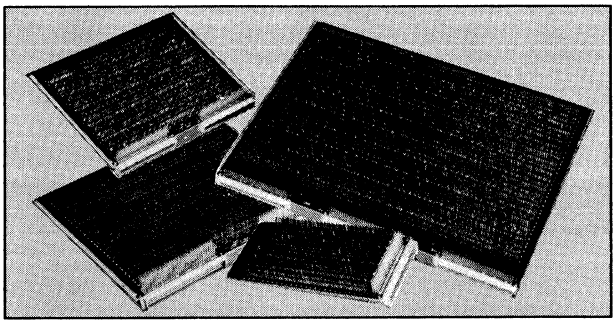
Customer Specials

Dage can produce variations on the above designs, or complete new designs, quickly and economically.

Our staff will be pleased to discuss your board and wiring requirements.

dataCon — WIRE-WRAPPABLE BOARDS

VMEbus-COMPATIBLE IC PLUGGABLE WIRE-WRAPPABLE BOARDS



To meet the skyrocketing worldwide demand for VMEbus board level products, dataCon now offers a complete range of IC pluggable wire-wrappable boards in a variety of VMEbus configurations. These boards, designed to conform fully to VMEbus specifications, combine the packaging ease of pluggable assemblies with the field versatility of wire-wrapping.

Available for virtually any VMEbus system application, dataCon offers these boards in four basic sizes, including standard, half-wide, double-wide and double-wide/double-high, and in a variety of pin configurations to accommodate up to 252 IC devices for high density packaging.

As desired, dataCon VMEbus boards can be furnished with one-, two-, or three-level wire-wrap posts and with hole patterns either perpendicular to or parallel to I/O rows. In addition to standard .800″ spacing between boards, .700″ spacing can also be furnished for higher density packaging of boards in racks and enclosures.

All dataCon wire-wrap posts are extremely straight, milled square posts, positioned within .010″ of true center for precise wire-wrapping. All posts have sharp, square corners (within a .003″ radius) for reliable, gas-tight connections with 40 years expected life. Posts can be tin or gold plated.

Accessories for dataCon's VMEbus boards include front panels, pull handles and ejector keys. High density Eurocard connectors can also be furnished. Racks and backpanels for the VMEbus boards will be available as accessories.

Materials:

Base Material: Glass fiber base epoxy resin, Copper clad per MIL-P-13949 NEMA Grade, SEO designated as UL 94V-0.

Finish: Solder mask per IPM-SM-840 over bare copper per MIL-STD-275 or by special order
Solder plate .0003″ minimum 60/40 tin-lead per MIL-STD-275.

PART NUMBERING SYSTEM

V M E X X X - X X X X X - X X

HEIGHT	See Detail A

LENGTH	See Detail A

PATTERN DESIGNATION	
0	Columns perpendicular to I/O rows
1	Columns parallel to I/O rows

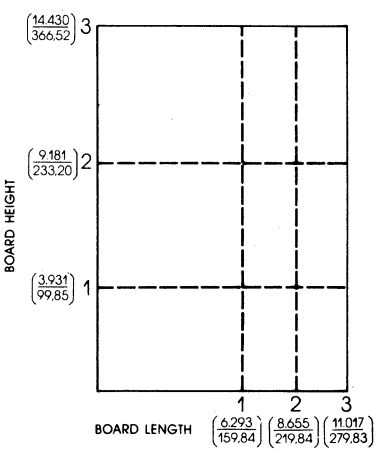
PIN LENGTH	
-3	Three level wrap
-2	Two level wrap
-1	Mini wrap
-X	Short wire-wrap pin for minimum card spacing

ACCESSORIES	
NO	None
FP	Front Panel
PH	Pull Handle
EK	Ejector Key

V & G TERMINAL TYPE	
SNC	Separate V & G terminals do not have spring contacts
S	Separate V & G terminals do have spring terminals

PLATING		
	Contact	Sleeve
B	gold	gold
D	gold	tin

DETAIL A



BACKPLANES

- dataCon now offers VMEbus backplanes that are compatible with our VMEbus boards.
- J1 and J2 backplanes are standard options available in 5, 9 and 20 positions with either "on-board" or "off-board" terminations.
- Capabilities are available for the J3 backplane.
- All backplanes are loaded with DIN 41612 pressfit connectors.

J1 BACKPLANE

- Fully bussed for 16 bit logic.
- .125″ thick, 6 layer board construction.
- Available in both "on-board" and "off-board" terminations.
- Power connections are dataCon's solder lug, part number 01-0166.

J2 BACKPLANE

- "b" row of connectors are bussed for 32 bit logic.
- .125″ thick, 2 layer board construction.
- Available in both "on-board" and "off-board" terminations.
- Power connections are dataCon's solder lug, part number 01-0166.

"ON BOARD" TERMINATIONS

Each "on-board" backplane is supplied with resistor networks and capacitors which enable user to plug in "as is."

"OFF-BOARD" TERMINATIONS

Each "off-board" backplane is supplied with two terminator boards which are mounted on the rear of the backplane at a 90 degree angle.

TERMINATOR BOARDS

Additional terminator boards may be ordered as needed. The part numbers for these terminator boards are shown below.

APPLICATION	PART NUMBER
J1, Perpendicular	VME-TB-J1A
J1, Parallel	VME-TB-J1B
J2, Perpendicular	VME-TB-J2A
J2, Parallel	VME-TB-J2B

PART NUMBERING SYSTEM

V M E - B P - X X - X X - X X

SERIES
VME-BP

NUMBER OF POSITIONS
5
9
20

TERMINATION	
ON	on-board
OF	off-board

STYLE	
J1	Fully bussed
J2	Bussed along b row of connector only

NOTE:
Backplanes are supplied singularly. Orders for double or triple high units must include orders for two or three backplanes according to above part number system.

Example: VME-BP-5-ON-J1 is a 5 position on-board termination J1 Backplane.

dataCon
Interconnect Sub-Systems

Corp. Headquarters
Eastern Division
60 Blanchard Road
Burlington, MA 01803
(617) 273-5800
Outside Massachusetts:
(800) 332-WRAP
FAX: (617) 273-4809

Mid-Western Division
502 Morse Avenue
Schaumburg, IL 60193
(312) 529-7690
FAX: (312) 529-6624

Western Division
20150 Sunburst Street
Chatsworth, CA 91311
(818) 700-0600
(800) 283-3266
FAX: (818) 700-0936

Mid-Atlantic Division
207 Witmer Road
Horsham, PA 19044
(215) 443-8400
FAX: (215) 672-9867

Sales Office
80 Orville Drive
Bohemia, NY 11716
(516) 589-1100
FAX: (516) 589-1207

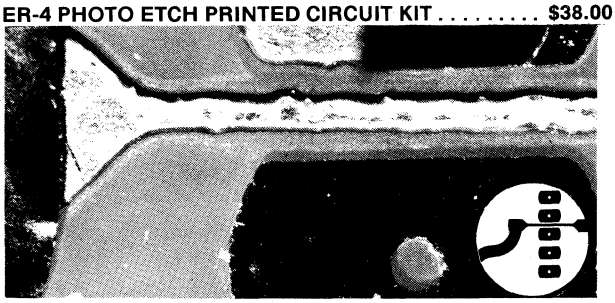
DATAK-PRINTED CIRCUIT KITS

THE DATAK CORPORATION 3117M Paterson Plank Road, North Bergen, NJ 07047 (201) 863-7667

PHOTO ETCH™ Printed Circuit Kit

Photograph original 1:1 master art or PC patterns directly from a magazine page using remarkable POS-NEG™ system (patented). No darkroom or camera needed. Set has all materials to make original artwork masters, film negatives and positives. Use the 5"x 6" print frame, copper clad boards, negative photoresist and chemicals to sensitize, expose, develop and etch printed circuit boards. 12 page instruction book covers the theory and practical instructions. Photoflood bulb must be purchased separately at any camera store.

ER-4 PHOTO ETCH PRINTED CIRCUIT KIT $38.00



Dry Transfer DIRECT ETCH™ Resist in Action

OTHER PRINTED CIRCUIT PRODUCTS

TINNIT™ Electroless Bright Tin Plate

TINNIT is supplied as a dry powder. Dissolved in a pint of water, it will plate about 700 sq. ins. of clean copper with a bright tin plating. No electricity is needed. Use to enhance solderability and conductivity on edge card connector patterns.

ER-18 TINNIT™ BRIGHT TIN PLATE $4.75

Etch Resist Pen

Felt pen has lacquer ink that is impervious to PC etchants.

ER-15 ETCH RESIST PEN $1.95

Dry Concentrated Etchant

¼ pound anhydrous ferric chloride in vapor tight pack makes 1 pint etchant, enough for 200 sq. in. of copper board. Cost less than liquids.

ER-3 DRY CONCENTRATED ETCHANT $3.00

Power Etch Pump Kit

Circulates etchant with air to speed etch rate. Kit has pump, coupling hose, perforated distributor tube.

ER-12 POWER ETCH PUMP $7.75

POS-NEG™ Photocopy Film and Accessories

Makes negatives or positives from opaque or translucent original art in one step without a camera. No darkroom needed but use subdued light. Use with yellow filter (ER—17) and EAL photoflood lamp. Read ER-16 Photo Etch Manual before opening this film.

ER-5 SIX SHEETS 5" x 6" POS—NEG FILM $7.50
ER-9 TWO SHEETS 8" x 11" POS-NEG FILM 7.50
ER-16 PHOTO ETCH MANUAL 1.75
ER-17 8½" x 11½" YELLOW FILTER 3.00

Contact Printing Frame

A solidly made plated steel and glass exposure frame. Spring back adjusts for film or circuit board exposure. Kit includes ER-17 yellow filter and ER-16 Photo Etch Manual. 9"x 12" size.

ER-10 CONTACT PRINTING FRAME, 9" x 12" $13.95

Film Process Chemicals

Three packets make 1 pint lithographic film developer and 1 pint acid fixer. Handles 15 sheets 5" x 6" Pos-Neg film.

ER-6 FILM PROCESS CHEMICALS $4.50

Negative Photo Resist Liquid and Developer

Spray on PC board and expose through negative. Unexposed areas are dissolved by developer. Exposed areas harden and are etch resistant. Four ounce bottle with pump spray coats over 1700 sq. in. Develop ONLY with ER-8 or Kodak KPR developer.

ER-71 PHOTO RESIST LIQUID, 4 ounce $7.55
ER-8 NEGATIVE RESIST DEVELOPER, 16 ounce 4.75

DIRECT ETCH™ Printed Circuit Kit

This one step kit uses a unique dry transfer resist that makes razor-sharp patterns on copper clad boards. Lay out circuits right on the copper with these etch resistant dry transfers. Connect with dry transfer lines or the special tape, then etch in ferric chloride or in any commercial PC etchant. Results are equal to or better than commercial boards. Kit includes PC boards, dry transfer resist patterns, resist tapes, ferric chloride etchant, etch tray and instructions.

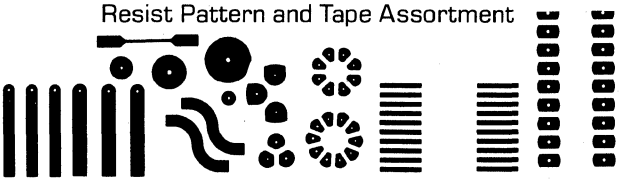
ER-1 DIRECT ETCH PRINTED CIRCUIT KIT $10.50

DRY TRANSFER ETCH RESIST PATTERNS

DATAK prints a broad range of dry transfer resist patterns with an ink that is impervious to all commercial etchants. This ink is identical to that used in printing the JotDraft and Microseries range of donuts and connector patterns. See our full line catalog for additional etch resist patterns.

17.6X BLOWUP shows .015" line between .100" spaced DIP pads. Resist pattern is from DATAK ER-2 set. Circuit board is 2 ounce copper etched in a still bath of ferric chloride for 30 minutes at 125°F. Measured undercut is less than .0015"

Resist Pattern and Tape Assortment



Our best selling set includes 8 sheets of donuts, .125" and .156" connector fingers, transistors, round IC's, DIPs of any size, dry transfer traces and 2 rolls of resist tape. This set is in the ER-1 and ER-4 kits.

ER-2 DRY TRANSFER ETCH RESIST ASSORTMENT .. $6.95

Resist Donut Pad Assortment

Set contains 4 sheets of donuts 1/16" through ¼" dia. with .025" center holes.

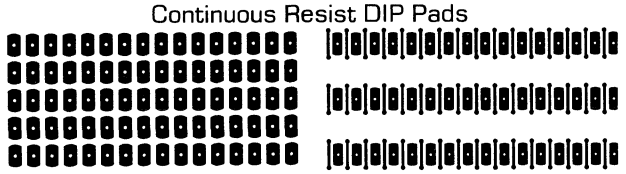
ER-13 DONUT PAD ASSORTMENT $3.75

Resist DIP Pattern Assortment

Set has 4 sheets of continuous .100" x .300" DIP patterns and .050" spaced flatpack fingers. Rub down the length you need. See also JD-171, JD-174.

ER-14 DIP PATTERN ASSORTMENT $3.75

Continuous Resist DIP Pads



From JD-171 **From JD-174**

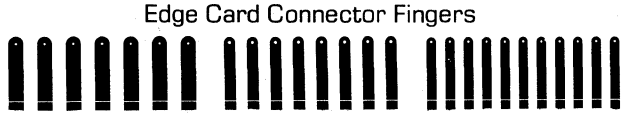
JD-171 set contains 24 sheets of continuous .125"D x .070" cut pads spaced on .100" x .150" centers. Transfer pads on any multiple of .150" or .100". Do any size DIP pattern accurately and fast.

JD-171 RESIST DIP PADS $13.50

JD-174 has 24 sheets of continuous .125"D x .053" cut pads spaced on .100" x .150" centers with a trace between adjacent pads. Pads transfer alone or with traces on any multiple of .100" or .150". Do a large ROM or a ½ DIP with equal ease.

JD-174 RESIST DIP PADS WITH TRACES $13.50

Edge Card Connector Fingers



.156 Spacing **.125 Spacing** **.100 Spacing**

Sets contain 24 strips of spaced connector fingers. Each strip of fingers is 8" long. Butt strips for any connector length.

JD—122R ASST. CONNECTOR FINGERS: .156"& .125" $13.50
JD-168 CONNECTOR FINGERS: .100" 13.50

SEE SECTION 2400 FOR DATAK PANEL MARKING SETS AND WIRE MARKERS

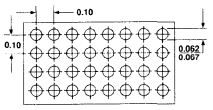
VECTOR ELECTRONIC COMPANY

VECTOR ELECTRONIC COMPANY, 12460 Gladstone Ave., Sylmar, CA 91392-9208
Phone 818-365-9661, FAX: 818-365-5718 Call Toll Free in CA 800-426-4652,
Outside CA 800-423-5659 (For custom configurations contact factory directly.)

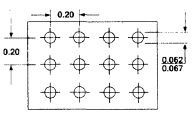
Vectorbord® Prototyping Boards (Punchboards)

Precision drilled or prepunched, Vectorbord® Prototyping Boards are convenient economical design tools and cost efficient alternatives to custom designs. Available in several hole patterns, many are copper clad. Sockets and pins, terminals, tools, and accessories are available separately.

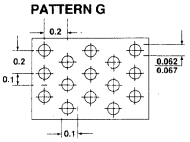
PATTERN H



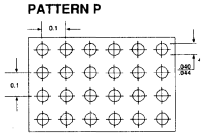
PATTERN F



PATTERN G

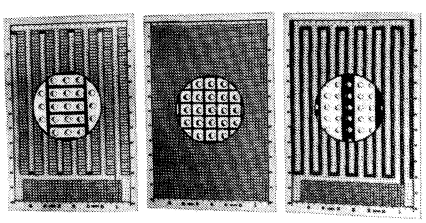


PATTERN P



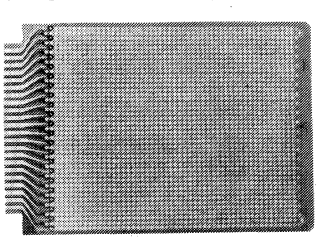
Vectorbord® Printed Circuit Prototyping Boards (Circbords)

Formerly called Circbords, Vectorbord® Prototyping Boards with printed circuitry cover a wide range of design requirements – without the expense of edge connectors. All boards have provisions for I/O connectors. Several circuit patterns are available, see Plugbord™ section for pattern descriptions. All bus and pad surfaces are solder coated for user convenience. Holes are 0.042" diameter, hole patterns based on 0.1" grids. Sockets and pins, terminals, tools, and accessories available separately.



Vectorbord® Plugbords™

Streamline design activities with Vectorbord® Plugbords™. 0.042" diameter holes on 0.1" grids, built to precise specifications, and available in a variety of patterns, including:



Vectorbord® Prototyping Boards

Pattern	Part No.	Width	Length	Thick	Hole	Material
P	59P44-032	4.50	6.00	0.031	0.042	FR4 Epoxy Glass
P	64P44EP	4.50	6.50	0.062	0.042	FR3 Epoxy Paper
P	64P44WE	4.50	6.50	0.062	0.042	FR4 Epoxy Glass
P	64P44XXXP	4.50	6.50	0.062	0.042	FR2 Phenolic
P	64P44	4.50	6.50	0.062	0.042	CEM-1 Epoxy Glass Composite
P	84P44WE	4.50	8.50	0.062	0.042	FR4 Epoxy Glass
P	169P44C1	4.50	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P44	4.50	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P44XXXP	4.50	17.00	0.062	0.042	FR2 Phenolic
P	169P44WEC1	4.50	17.00	0.062	0.042	FR4 Epoxy Glass
P	169P44WE	4.50	17.00	0.062	0.042	FR4 Epoxy Glass
P	169P44EP	4.50	17.00	0.062	0.042	FR3 Epoxy Paper
P	169P47EP	4.80	17.00	0.062	0.042	FR3 Epoxy Paper
P	169P59-047	6.00	17.00	0.047	0.042	FR4 Epoxy Glass
P	169P59-032	6.00	17.00	0.031	0.042	FR4 Epoxy Glass
P	169P59C1	6.00	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P59XXXP	6.00	17.00	0.062	0.042	FR2 Phenolic
P	169P79WE	8.00	17.00	0.062	0.042	FR4 Epoxy Glass
P	169P79	8.00	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P84	8.50	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P84C1	8.50	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P84EP	8.50	17.00	0.062	0.042	FR3 Epoxy Paper
P	169P84WE	8.50	17.00	0.062	0.042	FR4 Epoxy Glass
P	169P84WEC1	8.50	17.00	0.062	0.042	FR4 Epoxy Glass
P	349P84	8.50	35.00	0.062	0.042	CEM-1 Epoxy Glass Composite
P	169P99	10.00	17.00	0.062	0.042	CEM-1 Epoxy Glass Composite
G	42G22WEC1	4.50	8.50	0.062	0.062	CEM-1 Epoxy Glass Composite
G	42G24WE	4.80	8.50	0.062	0.062	CEM-1 Epoxy Glass Composite
G	85G24EP	4.80	17.00	0.062	0.062	FR3 Epoxy Paper
G	85G24WE	4.80	17.00	0.062	0.062	CEM-1 Epoxy Glass Composite
G	85G42EP	8.50	17.00	0.062	0.062	FR3 Epoxy Paper
G	85G42WE	8.50	17.00	0.062	0.062	FR4 Epoxy Glass
H	85H48WE	4.80	8.50	0.062	0.062	FR4 Epoxy Glass
H	170H48WE	4.80	17.00	0.062	0.062	FR4 Epoxy Glass
H	85H85WE	8.50	8.50	0.062	0.062	FR4 Epoxy Glass
H	170H85WE	8.50	17.00	0.062	0.062	FR4 Epoxy Glass
F	85F24EP	4.80	17.00	0.062	0.062	FR3 Epoxy Paper
F	85F42WEC1	8.50	17.00	0.062	0.062	CEM-1 Epoxy Glass Composite
F	175F99WE	20.00	35.00	0.062	0.062	FR4 Epoxy Glass

Vectorbord® Printed Circuit Prototyping Boards

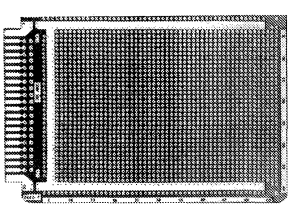
Part No.	Width	Length	Thick	Hole Diameter	16 Pin DIP Capacity	Material	Circuit Pattern
8009	3.500	11.500	0.062	0.042	94	Copper Clad Epoxy Glass	Pad-Per-Hole
8010	4.000	13.000	0.062	0.042	124	Copper Clad Epoxy Glass	Pad-Per-Hole
8008	4.000	6.500	0.062	0.042	70	Copper Clad Epoxy Glass	Pads & Planes
8001	4.500	6.500	0.062	0.042	20	Epoxy Glass Composite	3 Hole Solder Pad
8007	4.500	6.500	0.062	0.042	60	Epoxy Glass Composite	Pad-Per-Hole/Ground Plane
8004	4.500	6.500	0.062	0.042	50	Epoxy Glass Composite	Ground Plane
8003	4.500	6.500	0.062	0.042	60	Epoxy Glass Composite	Pad-Per-Hole
8002	4.500	6.500	0.062	0.042	36	Epoxy Glass Composite	Interleaved Buses
3677-6	4.500	8.080	0.062	0.042	21	Epoxy Glass Composite	3 Hole Solder Pad
45P80-1	4.500	8.080	0.062	0.042	103	Epoxy Glass Composite	Pad-Per-Hole
8011	4.500	9.600	0.062	0.042	103	Copper Clad Epoxy Glass	Pad-Per-Hole
8006	5.000	13.250	0.062	0.043	154	Epoxy Glass Composite	Pad-Per-Hole
8012	9.200	11.000	0.062	0.042	283	Copper Clad Epoxy Glass	Pad-Per-Hole
106P106-1	10.600	10.600	0.062	0.042	275	Epoxy Glass composite	Pad-Per-Hole

Contacts Only Pattern

Boards are bare except for edge connector contacts. Available with connector contacts committed for general purpose applications, or to bus specific specifications. Contacts Only boards provide unrestricted component placement and accommodate both wire wrap and solder connectors.

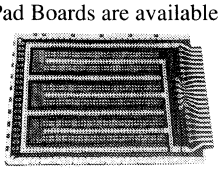
Pad-Per-Hole Pattern

For convenient mounting of DIPs and other components, Pad-Per-Hole Boards features 0.80" diameter, isolated solder pads around all holes, both sides. Most boards in this pattern have plated-thru holes.



3-Hole Solder Pad Pattern

3 hole, solder coated pads for convenient connections to IC leads and sockets, or axial-lead resistors and capacitors. Interleaved voltage and ground buses for overall accessibility. Board capacities can be maximized by mounting DIP IC sockets and other components over bus lines. Wire Wrap pins for 3-Hole Solder Pad Boards are available separately.



Bus Patterns

Voltage and ground buses (or planes) are incorporated into an overall circuit pattern for most Vectorbords®. Other boards combine circuit patterns with one of the bus designs described below. Still other boards are manufactured with "buses only," for maximum design flexibility. All Vectorbord® bus surfaces are solder plated for user convenience.

VECTOR ELECTRONIC COMPANY

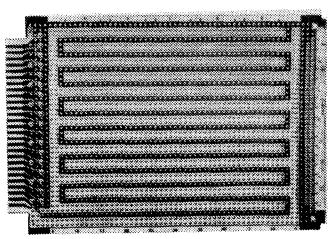
VECTOR ELECTRONIC COMPANY, 12460 Gladstone Ave., Sylmar, CA 91392-9208
Phone 818-365-9661, FAX: 818-365-5718 Call Toll Free in CA 800-426-4652,
Outside CA 800-423-5659 (For custom configurations contact factory directly.)

Vectorboard® Plugboards™ – General Purpose

Part No.	Length	Width	Spacing	Contacts	Thick	Hole Diameter	16 Pin DIP Capacity	Material	Solder Connector	Wire Wrap Connector	Extender	Patterns
3797-2	2.730	4.500	.156	30	0.062	.042	4	Epoxy Glass Composite	R630		3690-10	3 Hole Solder Pad
3797	2.730	4.500	.156	30	0.062	.042	15	Epoxy Glass Composite	R630		3690-10	Contacts Only
3795-1	2.730	4.500	.100	44	0.062	.042	4	Epoxy Glass Composite		R644-2	3690-8	3 Hole Solder Pad
3795	2.730	4.500	.100	44	0.062	.042	15	Epoxy Glass Composite		R644-2	3690-8	Contacts Only
3662-5	4.500	4.500	.156	44	0.062	.042	40	Epoxy Glass Composite	R644	R644-3	3690	Contacts Only
4112-5	4.500	4.500	.156	44	0.062	.042	8	Epoxy Glass Composite	R644	R644-3	3690	3 Hole Solder Pad
4494	4.500	6.500	.156	44	0.062	.042	42	Epoxy Glass Composite	R644	R644-3	3690	Voltage/Ground Planes
4112	4.500	9.600	.156	44	0.062	.042	40	Epoxy Glass Composite	R644	R644-3	3690-6	3 Hole Solder Pad
3662-2	4.500	9.600	.156	44	0.062	.042	90	Epoxy Glass Composite	R644	R644-3	3690-6	Contacts Only
3677	4.500	9.600	.156	44	0.062	.042	21	Epoxy Glass Composite	R644	R644-3	3690-6	3 Hole Solder Pad
3682	4.500	9.600	.156	44	0.062	.042	48	Epoxy Glass Composite	R644	R644-3	3690-6	Interleaved Buses
3682-4	4.500	6.500	.156	44	0.062	.042	24	Epoxy Glass Composite	R644	R644-3	3690	Interleaved Bus/Ground Plane
3662	4.500	6.500	.156	44	0.062	.042	50	Epoxy Glass Composite	R644	R644-3	3690	Contacts Only
3662-9	4.500	6.500	.156	44	0.062	.043	45	Epoxy Glass	R644	R644-3	3690	Pad-Per-Hole
3677-2	4.500	6.500	.156	44	0.062	.042	12	Epoxy Glass Composite	R644	R644-3	3690	3 Hole Solder Pad
4112-4	4.500	6.500	.156	44	0.062	.042	25	Epoxy Glass Composite	R644	R644-3	3690	3 Hole Solder Pad
3682-2	4.500	6.500	.156	44	0.062	.042	24	Epoxy Glass Composite	R644	R644-3	3690	Interleaved Buses
4610-1	4.500	6.500	.125	56	0.062	.042	59I	Epoxy Glass Composite	R656-1	R656	3690-16	Contacts Only
4610	4.500	6.500	.125	56	0.062	.042	20	Epoxy Glass Composite	R656-1	R656	3690-16	3 Hole Solder Pad
4610-2	4.500	6.500	.125	56	0.062	.042	35	Epoxy Glass Composite	R656-1	R656	3690-16	Interleaved Buses
4610-3	4.500	6.500	.125	56	0.062	.043	52	Epoxy Glass	R656-1	R656	3690-16	Pad-Per-Hole
3719-5	4.500	4.500	.100	72	0.062	.042	30	Epoxy Glass	R636-2	R636-1	3690-4	Contacts Only
4066-5	4.500	4.500	.100	72	0.062	.042	18	Epoxy Glass Composite	R636-2	R636-1	3690-4	Ground Plane/Interleaved Buses
4066-4	4.500	6.500	.100	72	0.060	.042	34	Epoxy Glass composite	R636-2	R636-1	3690-4	Ground Plane/Interleaved Buses
3719-6	4.500	6.500	.100	72	0.062	.043	40	FR4 Epoxy Glass	R636-2	R636-1	3690-4	Pad-Per-Hole
3719-1	4.500	6.500	.100	72	0.062	.042	50	Epoxy Glass Composite	R636-2	R636-1	3690-4	Contacts Only
3719-4	4.500	9.600	.100	72	0.062	.042	90	Epoxy Glass Composite	R636-2	R636-1	3690-2	Contacts Only
4493-1	4.500	9.600	.100	72	0.060	.042	63	Epoxy Glass Composite	R636-2	R636-1	3690-2	Voltage/Ground Planes
4350	7.000	9.600	.125	80	0.062	.042	62	Epoxy Glass Composite	R680-2	R680-1	3690-14	Voltage/Ground Planes
3673	7.980	9.600	.125	80	0.062	.042	152	FR4 Epoxy	R680-2	R680	3690-14	Contacts Only
8801-6	5.300	10.000	.125	100	0.062	.043	80	Epoxy Glass	R681-3	R681-1, -2	3690-12	Pad-Per-Hole
8801-1	5.300	10.000	.125	100	0.062	.042	110	Epoxy Glass Composite	R681-3	R681-1, -2	3690-12	Contacts Only
8804	5.300	10.000	.125	100	0.062	.042	70	Epoxy Glass Composite	R681-3	R681-1, -2	3690-12	Voltage/Ground Planes
8800V	5.300	10.000	.125	100	0.062	.042	52	Epoxy Glass	R681-3	R681-1, -2	3690-12	Voltage/Ground Planes

Bus patterns include:

Interleaved Bus Pattern: The Interleaved Bus Pattern originates at I/O area and is traced, voltage and ground in opposite directions, along the board perimeter. Both buses then are interleaved, or alternated, across board surface for overall accessibility. Interleaved buses may be etched onto one side of board only, or onto both sides of board, back to back and with plated-thru holes.



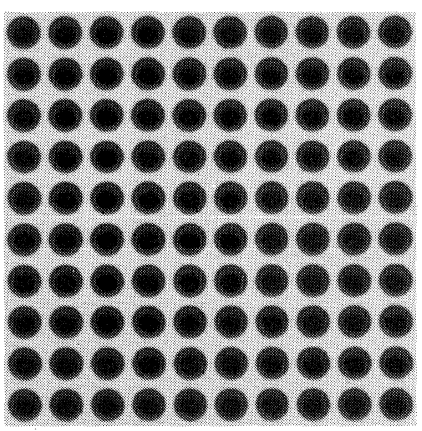
Peripheral Bus Pattern: Voltage and ground bus lines trace a path around board perimeter. Peripheral buses may be on one side of board, or back-to-back on both board sides with plated-thru holes.

Zig-Zag Buses: Zig-Zag shape provides access to voltage or ground at alternating holes.

Voltage/Ground Plane Pattern

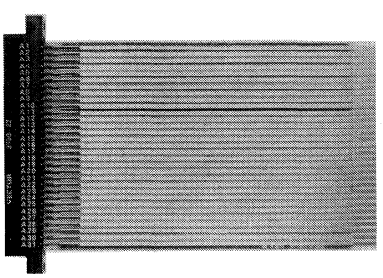
Overall power and ground planes on opposite board sides, with 0.085" diameter clearance pads around holes, both sides. Pins are committed easily to either plane using solder washers or connecting eyelets (available separately). Massive copper planes provide optimum signal performance – distributed capacitance, low inductance, low noise – and are ideal for DIP ICs, wire wrap posts, and socket pins.

Voltage/Ground Planes may be two-sided, one sided and combined with other Vectorbord circuit patterns, or one sided with edge contacts only on the other side.



Extenders

For in-system testing of functioning circuits. Construction is either FR4 epoxy glass or epoxy glass composite, with nickel/gold plated edge contacts, and gold plated socket contacts. Receptacles are installed and connected to 2 ounce etched circuit line on the board. Receptacle tabs in most models are designed to accept test clips or probes.



VECTORBORD® EXTENDER CARDS

Part No.	Contacts	Spacing	Height	Width	Material	Bus
3690-27	–	–	4.500	4.500	FR4 G10 Epoxy Glass	Mac II
3690-28	–	–	6.300	12.860	FR4 G10 Epoxy Glass	Mac II
3690-30	–	–	7.475	6.100	FR4 G10 Epoxy Glass	PS/2 50, 60
3690-31	–	–	7.475	7.650	Copper Clad Glass Epoxy	PS/2 80
3690-10	30	0.156	5.500	2.730	Epoxy Glass Composite	–
3690-26	36	0.100	5.600	6.700	Epoxy Glass Composite	IBM AT
	62	0.100				
3690-8	44	0.100	5.500	2.730	Epoxy Glass Composite	–
3690	44	0.100	6.500	4.500	Epoxy Glass Composite	–
3690-6	44	0.156	11.000	4.500	Epoxy Glass Composite	RCA Cosmac
3690-16	56	0.125	6.500	4.500	Epoxy Glass Composite	STD
3690-18	60	0.100	7.650	12.000	Epoxy Glass Composite	Multibus
	86	0.156				
3690-22	62	0.100	5.700	3.180	Epoxy Glass Composite	IBM PC, XT
3690-4	72	0.100	7.500	4.500	Epoxy Glass Composite	–
3690-2	72	0.100	11.000	4.500	Epoxy Glass Composite	–
3690-14	80	0.125	11.000	6.990	Epoxy Glass Composite	TI
3690-20	86	0.156	9.000	9.750	Epoxy Glass Composite	Motorola
3690-12	100	0.125	7.500	10.000	Epoxy Glass Composite	S100

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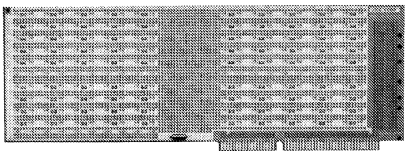
Outside CA 800-423-5659 (For custom configurations contact factory directly.)

Bus Specific Prototyping Boards

Vectorboard® Plugbords™ for specific bus architectures. Available in circuit patterns described in the general purpose Plugbord™ section – also available in high performance Vectorbord plus™ and Pads & Planes™ patterns for IBM and Macintosh machines.

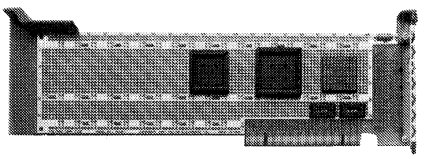
VECTORBORD plus™ Pattern

High performance prototyping boards – optimized for wire wrap. Full voltage and ground planes are on opposite board sides. Holes are 0.055" diameter on 0.1" grid, with 0.085" diameter clearance pad around holes on both sides. DIP mounting areas accept all standard lead spacings. Large PGA areas provide for mounting most PLCC and PGA devices. Vectorbord plus™ boards also provide mounting positions for SMD decoupling capacitors for superior noise and resonance blocking. SMD caps and socket pins installed as an option.



Pads & Planes™ Pattern

The Pads & Planes™ Pattern is designed for high performance circuitry, unrestricted component placement, and for mixing wire wrap and solder components on the same board. Full voltage and ground planes are on opposite sides of board. Holes are 0.042" diameter, plated-thru on 0.1" grid with 0.080" diameter isolated solder pad around each hole, both sides. The overall hole pattern provides for mounting DIP IC devices, as well as PLCC and PGA devices. Pads & Planes™ Boards also include mounting positions for SMD (Surface Mount Device) decoupling capacitors. SMD caps are installed as an option on some boards. All pad and plane surfaces are solder coated for user convenience.



Vectorbord® Bus Specific Plugbords™

Part No.	Width	Length	Hole Diameter	DIP Capacity	Material	Bus	Circuit Pattern	Solder Connector	Wire Wrap Connector	Extender	Card Cage
4610-1	4.500	6.500	0.042	59	Epoxy Glass Composite	STD	Contacts Only	R656-1	R656	3690-16	Series 13
4610	4.500	6.500	0.042	20	Epoxy Glass Composite	STD	3 Hole Solder Pad	R656-1	R656	3690-16	Series 13
4610-2	4.500	6.500	0.042	35	Epoxy Glass Composite	STD	Interleaved Bus	R656-1	R656	3690-16	Series 13
4610-3	4.500	6.500	0.042	52	Epoxy Glass	STD	Pad-Per-Hole	R656-1	R656	3690-16	Series 13
8801-6	5.300	10.000	0.042	110	Epoxy Glass	S100	Pad-Per-Hole	R681-3	R681-2	3690-12	CCK100S
8801-1	5.300	10.000	0.042	110	Epoxy Glass Composite	S100	Contacts Only	R681-3	R681-2	3690-12	CCK100S
8804	5.300	10.000	0.042	52	Epoxy Glass Composite	S100	Voltage Plane	R681-3	R681-2	3690-12	CCK100S
8800V	5.300	10.000	0.042	52	Epoxy Glass Composite	S100	Voltage Plane	R681-3	R681-2	3690-12	CCK100S
4609	3.060	7.700	0.042	22	Epoxy Glass Composite	Apple, II, IIe	2 Hole Solder Pad	–	–	–	–
4609-1	3.060	7.700	0.042	46	Epoxy Glass Composite	Apple II, IIe	Voltage/Ground	–	–	–	–
4618-7	3.475	11.500	0.042	79	FR4 Epoxy Glass	PS/2 50, 60, 80	Pads & Planes	–	–	3690-30, 31	–
4618-5	3.475	11.500	0.055	79	FR4 Epoxy Glass	PS/2 50, 60, 80	Vectorbord plus	–	–	3690-30, 31	–
4618C5LF	3.475	11.500	0.055	79	FR4 Epoxy Glass	PS/2 50, 60, 80	Vectorbord plus	–	–	3690-30, 31	–
5085-5	4.000	12.850	0.055	115	Epoxy Glass, 2 oz. Copper	Macintosh II	Vectorbord plus	–	–	3690-27, 28	–
5085C5LF	4.000	12.850	0.055	115	Epoxy Glass, 2 oz. Copper	Macintosh II	Vectorbord plus	–	–	3690-27, 28	–
5086-7	8.396	4.738	0.042	72	Glass Epoxy, Copper LAM	Macintosh SE	Pads & Planes	–	–	–	–
5085-7	12.861	4.000	0.042	86	Epoxy Glass, Copper LAM	Macintosh II	Pads & Planes	–	–	3690-27, 28	–
5085-4	12.861	4.000	0.055	115	Glass Epoxy	Macintosh II	Voltage/Ground	–	–	3690-27, 28	–
4613-2	4.210	13.235	0.042	55	Epoxy Glass	IBM PC, XT	Voltage Plane	–	–	3690-22	–
4613-1	4.210	13.235	0.042	84	Epoxy Glass	IBM PC, XT	Peripheral Bus	–	–	3690-22	–
4613	4.210	13.235	0.042	44	Epoxy Glass	IBM PC, XT	3 Hole Solder Pad	–	–	3690-22	–
4613-3	4.210	13.235	0.042	91	Epoxy Glass, 2 oz. Copper	IBM PC, XT	Pad-Per-Hole	–	–	3690-22	–
4613-5	4.210	13.235	0.055	120	FR4 G10 Epoxy	IBM PC, XT	Vectorbord plus	–	–	3690-22	–
4613C5LF	4.210	13.235	0.055	79	FR4 G10 Epoxy	IBM PC, XT	Vectorbord plus	–	–	3690-22	–
4613-7	4.210	13.235	0.042	120	Epoxy Galss, 2 oz. Copper	IBM PC, XT	Pads & Planes	–	–	3690-22	–
4617-3	4.800	13.250	0.042	96	Epoxy Glass, 2 oz. Copper	IBM AT	Pad-Per-Hole	–	–	3690-26	–
4617	4.800	13.250	0.042	39	Epoxy Glass	IBM AT	3 Hole Solder Pad	–	–	3690-26	–
4617-1	4.800	13.250	0.042	108	Epoxy Glass, 2 oz. Copper	IBM AT	Peripheral Bus	–	–	3690-26	–
4617-4	4.800	13.250	0.055	130	Epoxy Glass, 2 oz. Copper	IBM AT	Voltage/Ground	–	–	3690-26	–
4617-5	4.800	13.250	0.055	140	Epoxy Glass, 2 oz. Copper	IBM AT	Vectorbord plus	–	–	3690-26	–
4617C5LF	4.800	13.250	0.055	140	Epoxy Glass, 2 oz. Copper	IBM AT	Vectorbord plus	–	–	3690-26	–
4607	5.190	8.430	0.042	85	Epoxy Glass Composite	DEC	Contacts Only	–	–	–	–
4611-2	6.000	9.750	0.042	80	Epoxy Glass Composite	Motorola	Interleaved Bus	R685-2	–	3690-20	CCK100S
4611-1	6.000	9.750	0.042	119	Epoxy Glass Composite	Motorola	Contacts Only	R685-2	–	3690-20	CCK100S
4611	6.000	9.750	0.042	45	Epoxy Glass Composite	Motorola	3 Hole Solder Pad	R685-2	–	3690-20	CCK100S
4608	6.750	12.000	0.042	54	Epoxy Glass Composite	Multibus	3 Hole Solder Pad	R683-1, 5-1	–	3690-18	Series 18
4608-1	6.750	12.000	0.042	144	Epoxy Glass Composite	Multibus	Contacts Only	R683-1, 5-1	–	3690-18	Series 18
5086-7	8.396	4.738	0.042	72	Glass Epoxy, Copper LAM	Macintosh SE	Pads & Planes	–	–	–	–
5085-7	12.861	4.000	0.042	86	Epoxy Glass, Copper LAM	Macintosh II	Pads & Planes	–	–	3690-27, 28	–
5085-4	12.861	4.000	0.055	115	Glass Epoxy	Macintosh II	Voltage/Ground	–	–	3690-27, 28	–

YOUR MAGNETIC SHIELDING PROBLEMS END HERE!

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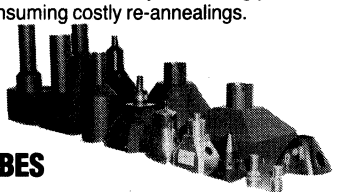
CUSTOM FABRICATED SHIELDS FOR COMPONENTS AND SYSTEMS

Any Specified Configuration or Shielding Requirement

From the simplest component to the most complex system, Ad-Vance Magnetics can design and fabricate an AD-MU shield incorporating your magnetic shielding performance requirements.

These include magnetic isolation chambers, shields for low field research, magnetic shielding components required in systems (such as CRT's), transformers, motors, tachometers, reed relays and computers, dewars for cryogenic research, various test chambers, video cameras, scan converter tubes, photomultiplier tubes, storage tubes, aircraft weather radar display tubes, etc.

Lasting shielding protection is provided because AD-MU alloys do not saturate when properly used, will not suffer excessive permeability loss from shock, and display minimum retentivity. Accordingly, there is no need for repeated time consuming costly re-annealings.



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Enhance CRT performance by eliminating effects of external magnetic fields on the electron beam.

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4 Excellent insurance against possible expensive, or irreplaceable losses.

8 ROUND SIZES

Part No.	A Inches	A Centi-meters	B Inches	B Centi-meters
TDP 72R07	7-1/4	18.42	3/4	1.91
TDP 72R15	7-1/4	18.42	1-1/2	3.81
TDP 86R07	8-5/8'	21.91	3/4	1.91
TDP 96R13	9-5/8	24.45	1-3/8	3.49
TDP 106R08	10-5/8	26.99	7/8	2.22
TDP 106R15	10-5/8	26.99	1-1/2	3.81
TDP 116R15	11-5/8	29.53	1-1/2	3.81
TDP 116R15P				

Made of AD-MU-00 .031" thick with protective .125" polyurethane foam liner in both top and bottom.

10 SQUARE/RECTANGULAR SIZES

Part No.	A Inches	A Centi-meters	B Inches	B Centi-meters	C Inches	C Centi-meters
CTDP 25S40 (Cassette)	5/8	1.588	5/8	10.48	2-5/8	6.67
TDP 2	12	30.48	12	30.48	3-1/4	8.55
TDP 5	12	30.48	12	30.48	7-3/4	19.685
TDP 75S50	7-1/2	19.05	7-1/2	19.05	5	12.7
TDP 97S30	9-3/4	24.76	9-3/4	24.76	3	7.62
TDP 97S70	9-3/4	24.76	9-3/4	24.76	7	17.78
TDP 117S17	11-3/4	29.845	11-3/4	29.845	1-3/4	4.445
TDP 117S32	11-3/4	29.845	11-3/4	29.845	3-1/4	8.55
TDP 117S77	11-3/4	29.845	11-3/4	29.845	7-3/4	19.685
TDP 117S150	11-3/4	29.845	11-3/4	29.845	15	38.1

Made of AD-MU-00 .050" thick. Finished in durable textured enamel.

INEXPENSIVE INSURANCE IN THESE UNCERTAIN TIMES

Proven AD-MU Tape Data Protectors and Cassette Tape Data Protectors provide inexpensive insurance against such hidden hazards.

Satisfied customers include all branches of the armed forces, NASA, and numerous private firms as well as other governmental organizations.

There is not a single reported instance in which tapes enjoying such secure protection have ever been affected by stray magnetic fields. The investments in such tapes have remained uniformly safe from harm.

"WHY TAKE MY MAGNETIC SHIELDING PROBLEMS TO AD-VANCE MAGNETICS?"

Over 90% past and present magnetic shield designs have been created and fabricated by engineers and production personnel with Ad-Vance. With such a record of experience, it seems likely that Ad-Vance people are the logical ones to solve your particular problem.

"What facilities does Ad-Vance have?"

Two modern, fully equipped plants in Rochester, Indiana, are across the street from each other. They contain up-to-date equipment for:

All types of metal forming
heliarc and spot welding
complete in-house tool room
deep drawing
CNC equipment
processing control of heat
treating and finishing
in-house quality control

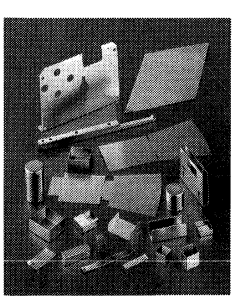
"What's Ad-Vance's industry and market position?"

Ad-Vance is the industry's largest, oldest and most experienced firm exclusively manufacturing magnetic shielding. Products from its factory are used off-planet in spacecraft and satellites as well as world-wide in exacting industrial, military, laboratory and consumer applications.

AD-MU SHEET STOCK — DELIVERY FROM STOCK

- For your in-house designing and manufacturing convenience.
- Easy to work, bend, stamp, draw, finish, etc. on ordinary sheet metal working equipment. SHIELDS MUST BE HEAT TREATED before end use or further finishing by plating, painting, etc.

JUST CUT AD-MU FOILS TO THE EXACT SHAPE YOU NEED



These Time-Saving High and Low Permeability Foils offer convenient, economical magnetic shielding. In many applications, their use can eliminate the costs of designing and manufacturing pre-fabricated shields. Foil shielding is also useful in hard-to-get-at-places. In addition, it permits more compact assemblies, accomplished by placing magnetically reacting components closer together with no performance degradation.

The foils exhibit useful ductility, so are readily hand trimmed to your desired outline on an ordinary cutting board, or with shears. They are then easily hand formed around the structure or component to be shielded. Simple adhesive tape can be used to hold them in place. They have already been properly heat treated so are ready for immediate use.

AD-VANCE MAGNETICS, INC.

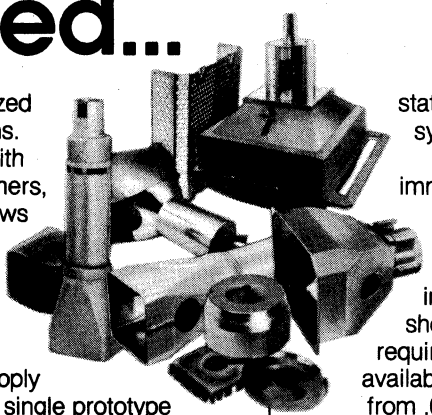
625 MONROE STREET, ROCHESTER, INDIANA 46975
(219) 223-ADMU / TWX (810) 290-0294 / FAX (219) 223-2524
The Problem Solving Magnetic Shielding Specialists—4 Decades of Magnetic Shielding Leadership

If we'd been there, maybe the Pterodactyl wouldn't have crashed...

...at least not the radio-controlled mechanical replica built for the Smithsonian Institution. While it flew successfully twenty-one times over the deserts of California, on its first flight near Washington, D.C., the pterodactyl lost control and crashed.

It was determined that an electro-magnetic device on the ground had interfered with the model's electronic control components. Appropriate magnetic shielding might have saved this pterodactyl from extinction.

For over twenty years, Amuneal has provided electromagnetic interference solutions for military, medical, scientific, industrial and commercial applications. You'll find our products in CRT displays and defibrillators, in computers and spacecraft, in scientific instrumentation across every frequency and spectrum, and in hundreds of specialized applications. Working with our customers, the list grows daily.



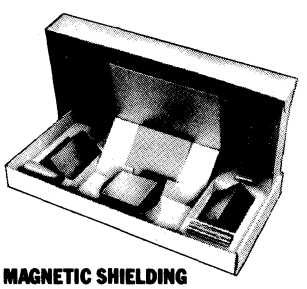
If you need magnetic shielding, we can supply you with a single prototype unit or a large production run—and we do it on time and competitively priced.

Give us a drawing of the device you want shielded and we'll select the proper alloy and suggest the most cost-effective way to design, fabricate, hydrogen anneal, and test your shield. All Amuneal products are manufactured and annealed in-house to MIL standards, including welding certification to MIL-W-6858 and MIL-W-8611, and inspected to our fully-documented, statistical quality control system (MIL-I-45208A).

We also offer immediate delivery from stock on Amumetal (80% Ni) and Amunickel (49% Ni) in both sheet and foil, sheared to your size requirements. Sheet is available in thicknesses from .014" to .062." Foil, in thicknesses from .002" to .010." All material can be delivered hydrogen-annealed for maximum permeability and attenuation.

For your next EMI/RFI, Tempest or room shielding material requirement, call or write Amuneal.

We're liable to keep your project from crashing.



MAGNETIC SHIELDING DEVELOPMENT AND EXPERIMENTAL KIT

This kit provides design engineers with various sizes and shapes of amumetal shielding alloy. All nine components are fully hydrogen-annealed to provide optimum EMI shielding properties.

$125.00

Ask for our FREE 60-page catalogue and NEW FAST-DESIGN FORM that makes it easy to prepare drawings for prototypes or quotations.

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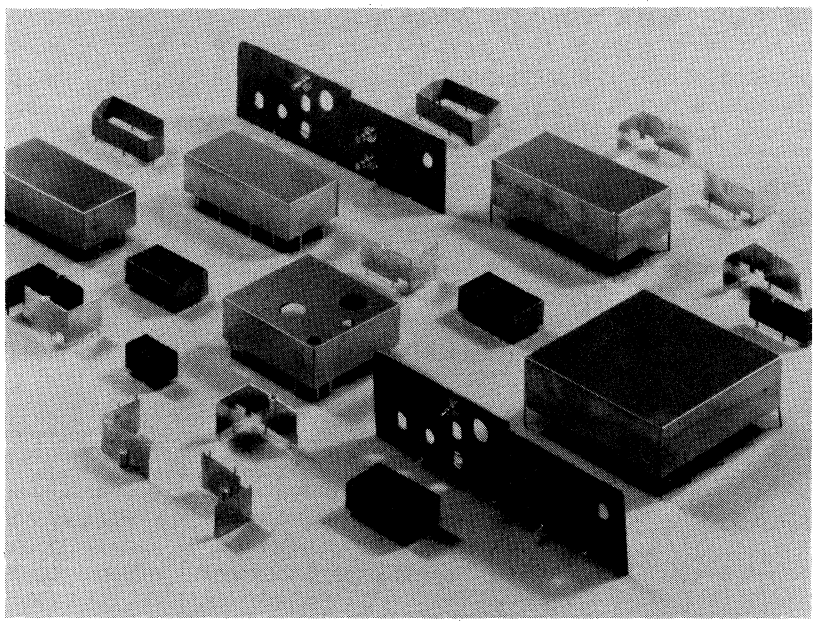
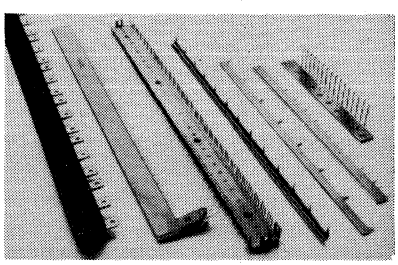
MANUFACTURING CORP.
4737 DARRAH STREET • PHILADELPHIA, PA 19124
215-535-3000 • FAX 215-743-1715

RFI / EMI SHIELDING

Atlee manufactures custom RFI/EMI shielding made from beryllium copper, brass or nickel silver. These shields are used to isolate the source of RFI on the circuit board.



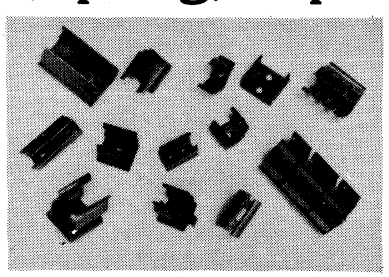
Bus Bars



Atlee is a full line manufacturer of bus bars serving the computer industry, avionics and military contractors. We have available design and engineering services as well as a prototype department. Atlee will manufacture any style bus bar to your specifications. Contact us for a catalog.

For detailed information see page C•1704, section 3200.

Component (Spring) Clips

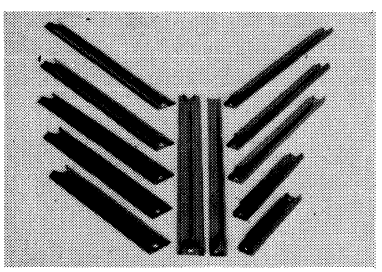


Commercial and MIL STD Clips for Immediate Delivery

M24066	M17160	MS28136
MS28137	NAS1465	MF21316

For detailed information see page B•1354, section 4300.

Card Guides



- Made of beryllium copper and stainless steel.
- Positive retention of circuit board under severe shock and vibration
- Quick and simple board insertion and withdrawal
- Military and commercial use

ATLEE

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SHIELDING LAMINATES

RFI: COPPER OR ALUMINUM FOIL LAMINATE
ESD: COPPER OR ALUMINUM FOIL LAMINATE
EMI: NICKEL FOIL LAMINATE OR IRON FOIL LAMINATE

GROUND STRAPS • GROUND PLANES

Substrates Include:

- ☐ Bergquist Sil-Pad®
- ☐ Chomerics Cho-Therm®
- ☐ Dupont Kapton®
- ☐ Dupont Nomex®
- ☐ Dupont Mylar® Polyester
- ☐ Fishpaper
- ☐ Foams-Neoprene, PVC, Urethane, Polyethylene
- ☐ General Electric Lexan® (FR-60)
- ☐ General Electric Ultem®
- ☐ General Electric Valox®
- ☐ G10/FR4 Epoxy Fiberglass
- ☐ ITW Fastex FRPP-301 Polypropylene
- ☐ Lydall S-350
- ☐ Lydall Duroid D-100 FR/D-225 FR/ D-800 FR
- ☐ Lydall Voltex 450
- ☐ Rigid PVC
- ☐ Windsor-Stevens FRP
- ☐ 3M Laminating Adhesives

Options:

- ☐ Die Cut/Sheared
- ☐ Scored/Punched/Formed
- ☐ Perforated/Creased/Folded
- ☐ Printed
- ☐ Laminated—Full or Selective Coverage
- ☐ Pressure Sensitive Adhesive Coated

ALL PARTS MADE WITH UL® RECOGNIZED MATERIALS
CERTIFICATE OF CONFORMANCE PROVIDED UPON REQUEST.

ALL INQUIRIES INVITED - 5 TO 15 DAY DELIVERY

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RECEIVE ACTUAL SAMPLE MATERIALS WITH OUTLINES ON
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Instead, Let Eagle Squelch The Problem

Solving your own EMI problems can be as difficult as killing seven flies with one blow. Using custom engineered magnetic shielding, Eagle can design and manufacture a dependable solution.

With over 18 years of continuous service, Eagle's technical experts offer support in custom and standard magnetic shield designs, engineering and proper material selection.

An Eagle solution is a superior technological investment that will save you both time and money. We're dedicated to solving your specific EMI problems with the most original and up-to-date design engineering available.

So, whether for prototype, small quantity or large volume capability, you can trust Eagle to respond with quality, reliable shields delivered on time.

Call Eagle at (317) 297-1030 for problem design assistance, or write for FREE engineering design information packet #03 and let us handle the squelching.

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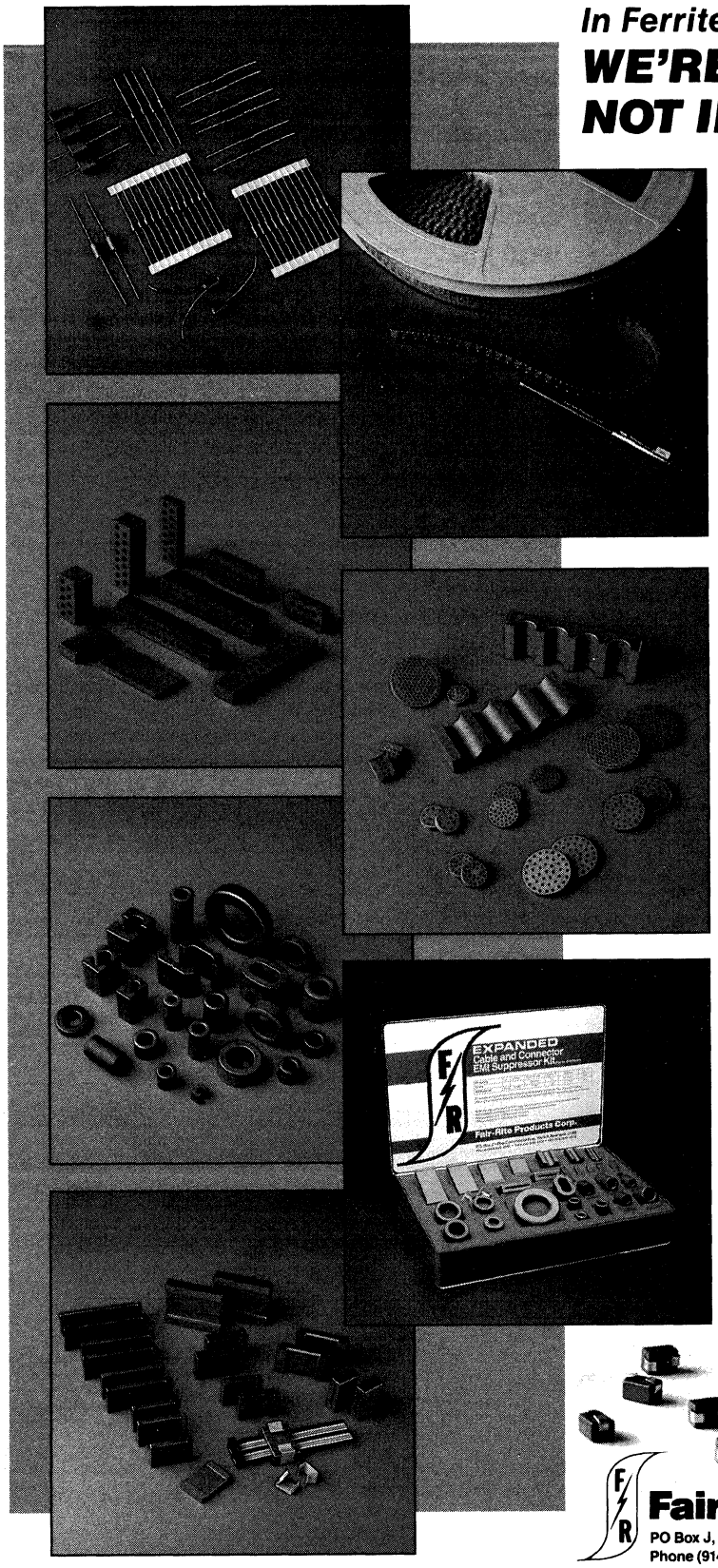


In Ferrites for EMI suppression...

WE'RE INNOVATORS — NOT IMITATORS

WE'RE FAIR-RITE

While other ferrite manufacturers exploited existing markets, our R&D looked to the future—and keeps looking—to find better ways to put ferrite to work in the control of Electromagnetic Interference.

In addition to the beads and sleeves which are industry standards, we developed most of the ferrite EMI suppressors widely imitated today, and were the first to offer what has become a series of Engineering Evaluation Kits.

No other source offers faster service and more tooling know-how for unique shapes than Fair-Rite Products.

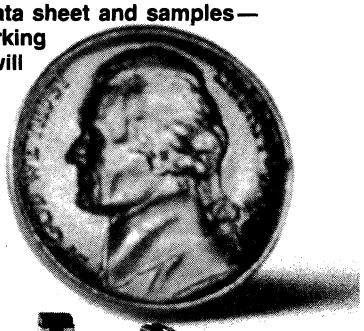
When it comes to EMI ferrites, the leaders come to Source One for quality, service and price from a U.S. manufacturer that supplies the world—FAIR-RITE

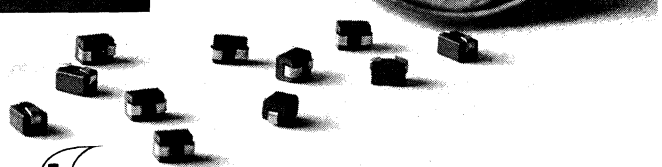
SURFACE MOUNT BEADS UPDATE

Z where you need it—
in a still smaller package.

Part number 2743027447 offers a minimum impedance of 20 ohms from 100 MHz thru 1 GHz, and a maximum of .7 milliohm DC; all in a rugged package 1.75mm wide × 1.5mm high × 2.0mm long. The terminal electrodes measure 0.2mm thick × 0.6mm square. Manufactured from application proven 43 material ferrite, stability and reliability far exceed what other manufacturers achieve using multiple turn, high resistivity thru hole plating.

Send for data sheet and samples—anyone working with SMT will be glad they did!

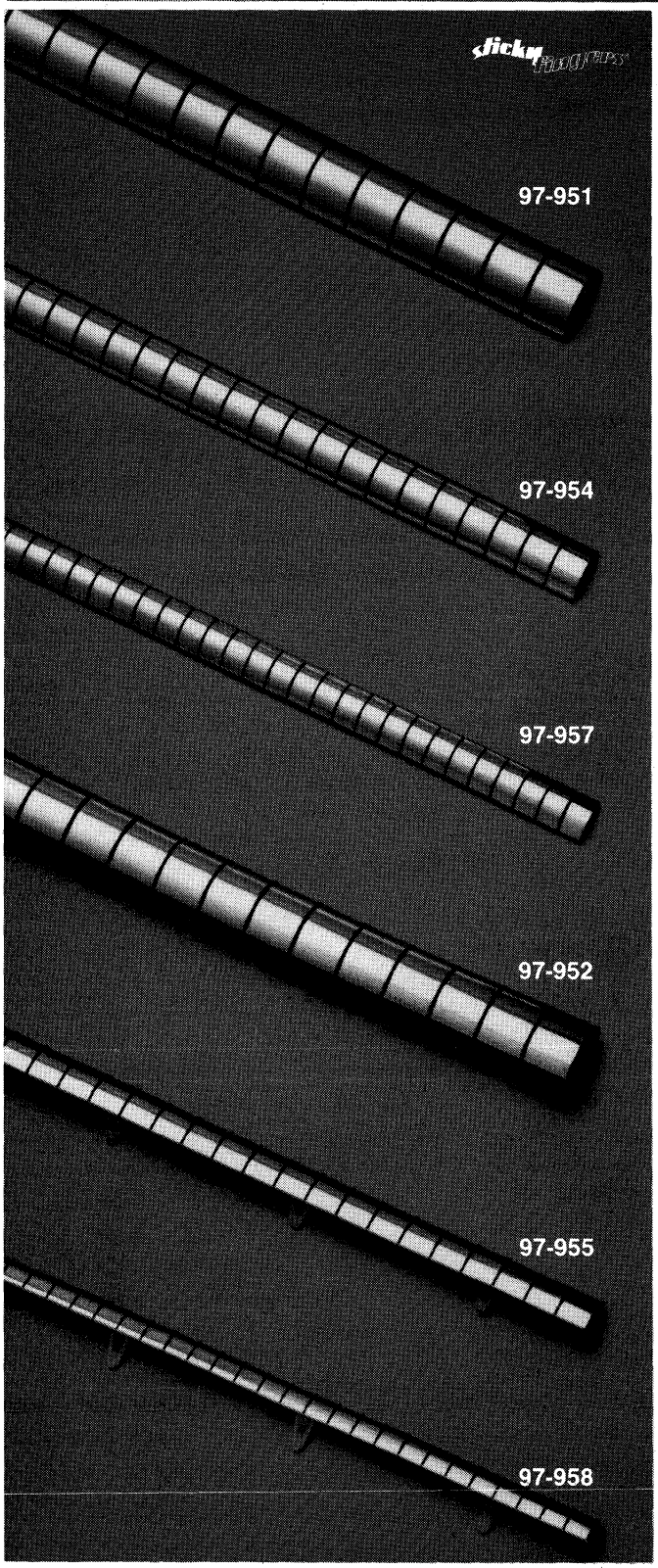




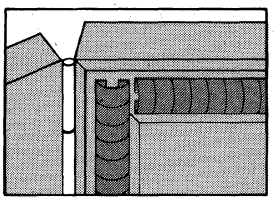
Fair-Rite Products Corp.

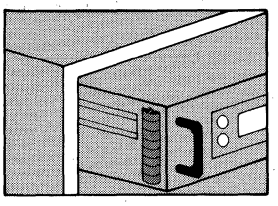
PO Box J, One Commercial Row, Wallkill, NY 12589
Phone (914) 895-2055 • TWX 510-249-4819 • FAX (914) 895-2629

Shielding — Symmetrical Slotted Shielding (S^3)



All strips exhibit typical minimum values of 100dB at 100 MHz.





With Sticky Fingers®

Series 97-951/954/957 are low-compression, adhesive-mounted beryllium copper shielding strips. Designed as a continuous band, the strip is slotted to permit spring contact throughout its length. A generous radius profile provides for the greatest incident engagement angle with the lowest force. As with all Sticky Fingers® shielding strips, a self-adhesive tape makes mounting easy and secure.

With bi-directional rivet mount

Series 97-952/955/958 are as described above, but with the addition of an integral pierced track to provide for mounting with .21″ (5,3 mm) long nylon push rivets in a .125″ (3,2 mm) dia. hole.

Designed especially for slide applications, this configuration allows total symmetrical compression action with bi-directional engagement. It is recommended for high-temperature and/or extremely high side-load situations, such as PC board connections and electronic drawers.

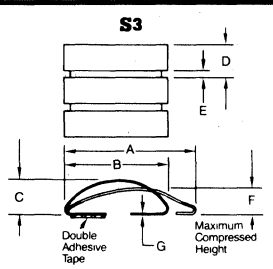
S3 Series Sticky Fingers®

Series	A	B	C Min.	D	E	F	G	Length
97-951	.76 (19,3)	.62 (15,8)	.22 (5,6)	.375 (9,53)	.030 (0,76)	.10 (2,5)	.004 (0,10)	15.0 (381)
97-954	.51 (13,0)	.45 (11,4)	.14 (3,6)	.250 (6,35)	.022 (0,56)	.08 (2,0)	.003 (0,08)	15.0 (381)
97-957	.38 (9,6)	.35 (8,9)	.11 (2,8)	.187 (4,75)	.018 (0,46)	.07 (1,8)	.003 (0,08)	15.0 (381)

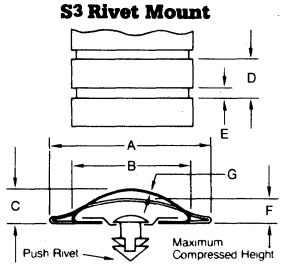
S3 Series Rivet Mount

Series	A	B	C Min.	D	E	F	G	Length	H	I	Number of Rivets
97-952	.76 (19,3)	.62 (15,8)	.22 (5,6)	.375 (9,53)	.030 (0,76)	.10 (2,5)	.004 (0,10)	15.0 (381)	.56 (14,2)	.94 (23,9)	10
97-955	.51 (13,0)	.45 (11,4)	.14 (3,6)	.250 (6,35)	.022 (0,56)	.08 (2,0)	.003 (0,08)	15.0 (381)	.63 (16,0)	.88 (22,4)	10
97-958	.38 (9,6)	.35 (8,9)	.11 (2,8)	.187 (4,75)	.018 (0,46)	.07 (1,8)	.003 (0,08)	15.0 (381)	.66 (16,8)	.84 (21,3)	10

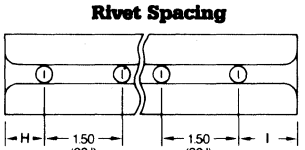
S3



S3 Rivet Mount



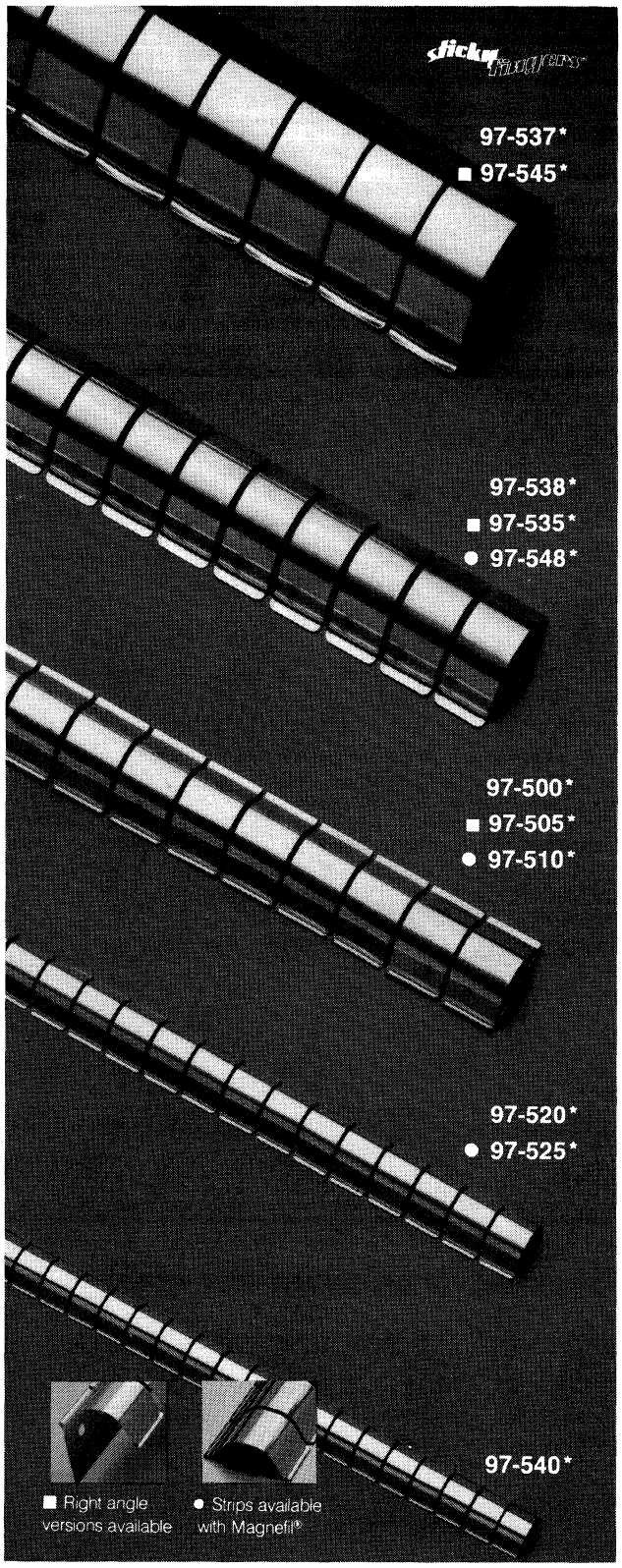
Rivet Spacing



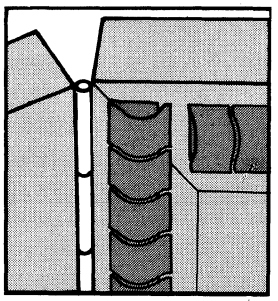
Metric units are indicated in parentheses.

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Shielding All-Purpose Gaskets



*Patent No. 3504095



These versatile shields are high-perfomance beryllium copper shielding contact strips with Sticky Fingers® self-adhesive backing. They provide an extremely tight, instant bond, and are ideal as an all-purpose contact strip for metal cabinets and electronic enclosures, particularly where space is critical.

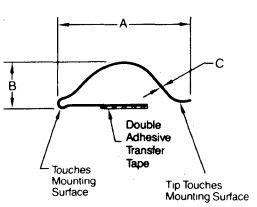
Shielding effectiveness of these strips has been proved to be greater than 46 dB at 14 kHz magnetic, and 108 dB at 10 GHz plane wave. When tested per MIL-STD-285 for electromagnetic shielding, these strips showed superior performance under minimum compression. They proved to be especially effective where variations exist in the space to be shielded, and in applications that require high shielding performance despite frequent opening and closing of the cabinet.

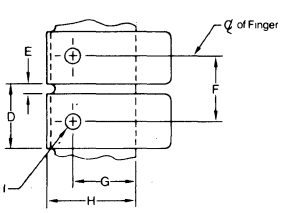
Strips 97-500 and 97-538 are furnished in standard lengths of 24″(610 mm), and in continuous 25-ft (7,6 M) coils. Series 97-520 and 97-540 are supplied in standard 16″ (406 mm) lengths and in 25-ft (7,6 M) coils. 97-537 strips are in 12″ (305 mm) lengths. All are available in your choice of finishes (see page 30).

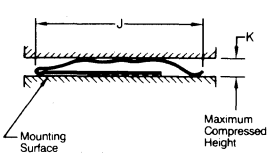
Please note that designated strips are available with Magnefil®, a rubber strip filled with magnetic particles, and inserted within the curve of the fingers. Magnefil provides increased magnetic field shielding.

Series	A Ref.	B Ref.	C	D	E	F	G	H	I Dia.
97-540	.28 (7,1)	.11 (2,8)	.003 (0,08)	.188 (4,78)	.018 (0,46)	.19 (4,8)	.08 (2,0)	.23 (5,8)	.06 (1,5)
97-520	.37 (9,4)	.14 (3,6)	.003 (0,08)	.250 (6,35)	.022 (0,56)	.25 (6,4)	.09 (2,3)	.31 (7,9)	.06 (1,5)
97-500	.60 (15,2)	.23 (5,8)	.004 (0,10)	.375 (9,53)	.032 (0,81)	.38 (9,7)	.31 (7,9)	.50 (12,7)	.08 (2,0)
97-538	.78 (19,8)	.25 (6,4)	.005 (0,13)	.375 (9,53)	.040 (1,02)	.38 (9,7)	.38 (9,7)	.53 (13,5)	.14 (3,6)
97-537	1.13 (28,7)	.41 (10,4)	.007 (0,18)	.500 (12,7)	.040 (1,02)	.50 (12,7)	.56 (14,2)	.78 (19,8)	.14 (3,6)

Series	J Ref.	K	Length in.(mm)	Coil ft (M)
97-540	.37 (9,4)	.04 (1,0)	16.0 (406)	25 (7,6M)
97-520	.50 (12,7)	.06 (1,5)	16.0 (406)	25 (7,6M)
97-500	.77 (19,6)	.06 (1,5)	24.0 (610)	25 (7,6M)
97-538	.94 (23,9)	.06 (1,5)	24.0 (610)	25 (7,6M)
97-537	1.94 (49,3)	.06 (1,5)	12.0 (305)	—





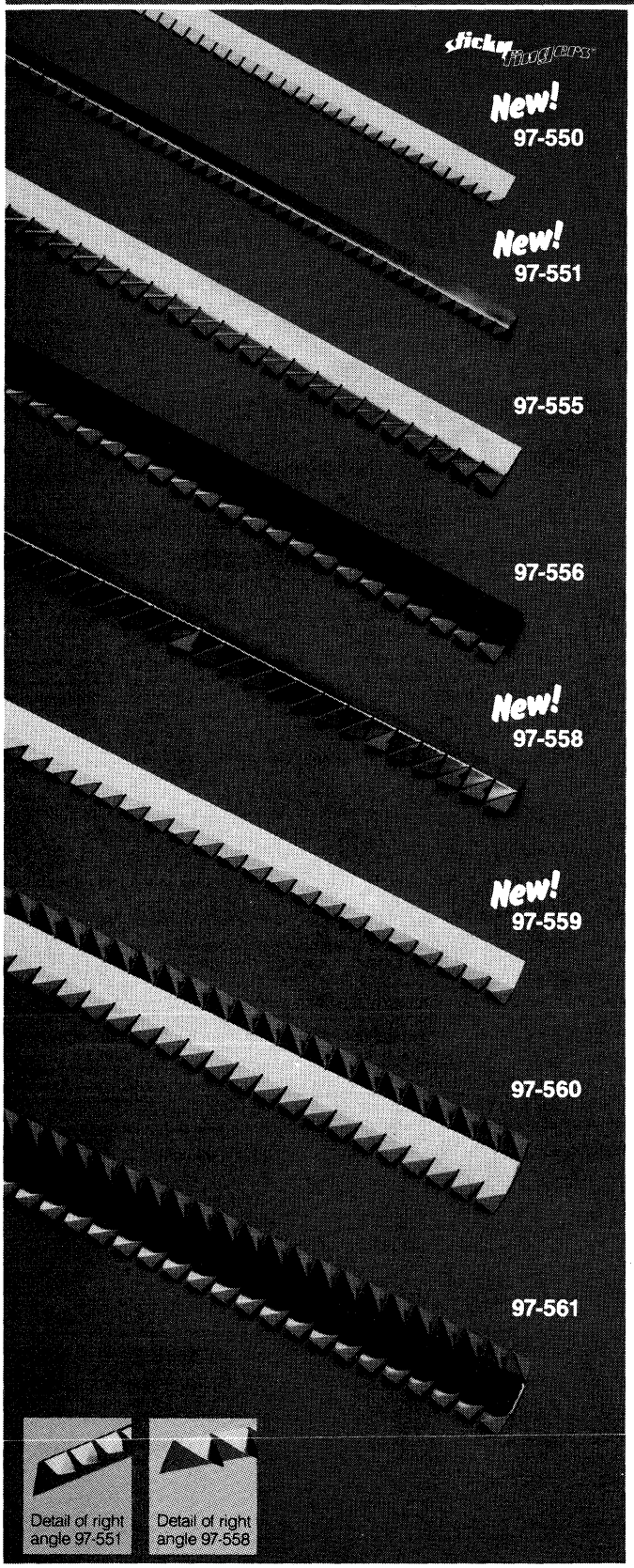


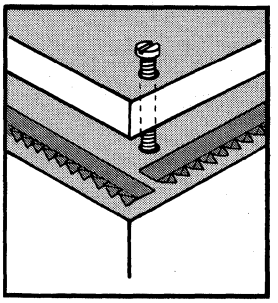
Metric units are indicated in parentheses.

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Shielding

Twist Series





Self-adhesive beryllium copper contact strips with scientific twist design offer narrower-than-ever electronic gaskets for general shielding applications where space is at a premium.

Four different widths are available to suit your specific application for single edge contact strips. Also available are two 90 degree versions (Series 97-551 and 97-558) to provide alternate mounting capability. Series 97-555, 97-558, and 97-559 provide shielding effectiveness greater than 85 dB at 100 MHz plane wave, ideal for all types of panel or electronic enclosures. Series 97-550, 97-551, and 97-560 on the other hand, provide shielding effectiveness greater than 115 dB at 100 MHz plane wave. Series 97-560 strips are especially suitable for cabinets with panel-divider bars. Their unique double-edge design permits panels to be removed easily and replaced without damage to the installed strip.

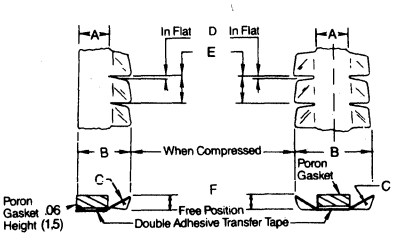
Poron environmental rubber gasket

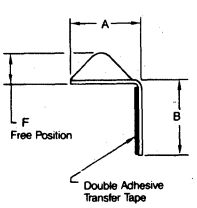
Series 97-556 and 97-561 are versions of 97-555 and 97-560, respectively, incorporating a Poron rubber gasket to act as an environmental shield, offering a high degree of protection against dust and moisture.

All twist series strips are furnished in 24" (610 mm) lengths. All strips except 97-551 and 97-558 are also available in standard 25-ft (7,6 M) coils. Parts may be supplied with holes for cleaning and plating purposes. These holes will not affect the overall performance of the product. Available in standard finishes (see page 30).

Twist Series

Series	A	B	C	D Slot	E Pitch	F	Length in.(mm)	Coil ft (M)	Gasket
97-550	.14 (3,6)	.23 (5,8)	.003 (0,8)	.015 (0,38)	.095 (2,41)	.03 (0,8)	24.0 (610)	25 (7,6)	NO
97-551	.08 (2,0)	.16 (4,1)	.003 (0,8)	.015 (0,38)	.095 (2,41)	.03 (0,8)	24.0 (610)	---	NO
97-555	.18 (4,6)	.34 (8,6)	.003 (0,8)	.015 (0,38)	.165 (4,19)	.07 (1,8)	24.0 (610)	25 (7,6)	NO
97-556	.18 (4,6)	.34 (8,6)	.003 (0,8)	.015 (0,38)	.165 (4,19)	.07 (1,8)	24.0 (610)	25 (7,6)	YES
97-558	.11 (2,8)	.20 (5,1)	.003 (0,8)	.015 (0,38)	.165 (4,19)	.07 (1,8)	24.0 (610)	---	NO
97-559	.18 (4,6)	.30 (7,6)	.003 (0,8)	.015 (0,38)	.165 (4,19)	.07 (1,8)	24.0 (610)	25 (7,6)	NO
97-560	.19 (4,8)	.50 (12,7)	.003 (0,8)	.015 (0,38)	.165 (4,19)	.07 (1,8)	24.0 (610	25 (7,6)	NO
97-561	.19 (4,8)	.50 (12,7)	.003 (0,8)	.015 (0,38)	.165 (4,19)	.07 (1,8)	24.0 (610)	25 (7,6)	YES



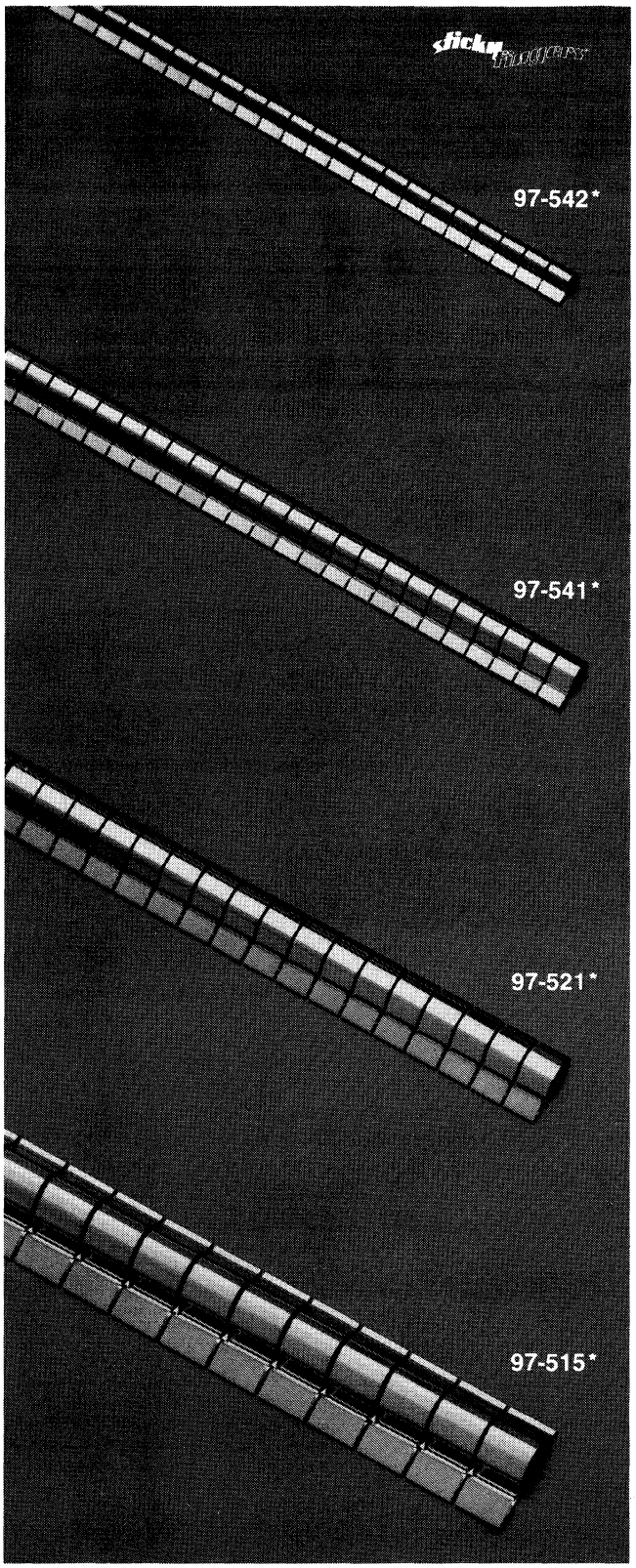


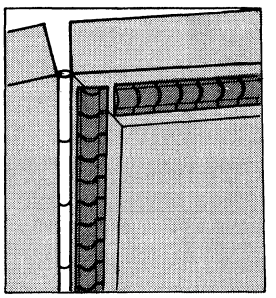
97-551/558

Metric units are indicated in parentheses.

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Shielding Foldover Series



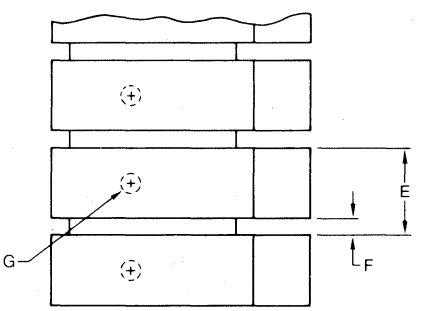


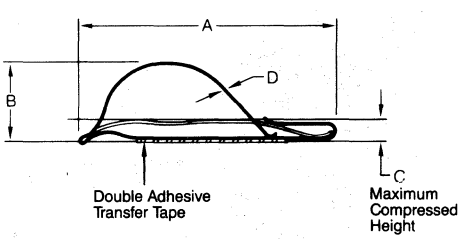
This version of Sticky Fingers® beryllium copper shielding gaskets features a special U-shaped end that permits the upper part of the strip to slide when enclosure doors are closed. It also retains the strip's fingers when enclosure doors are open, thus protecting accidental damage to the strip's fingers.

Four models provide you a choice of widths to suit your application. They are available in standard 16″ (406 mm) lengths, except 97-515 which is furnished in 24″ (610 mm) lengths. Also, all styles are available in continuous 25-ft (7,6 M) coils, and in your choice of all except tin lead and satin tin finishes (see page 30).

Foldover Series

Series	A Ref.	B Ref.	C	D	E	F	G Dia.	Length in./(mm)	Coil ft/(M)
97-542	.25 (6,4)	.08 (2,0)	.04 (1,0)	.003 (0,08)	.188 (4,78)	.018 (0,46)	.06 (1,5)	16.0 (406)	25 (7,6)
97-541	.38 (9,7)	.12 (3,1)	.05 (1,3)	.003 (0,08)	.188 (4,78)	.018 (0,46)	.06 (1,5)	16.0 (406)	25 (7,6)
97-521	.51 (13,0)	.14 (3,6)	.06 (1,5)	.003 (0,08)	.250 (6,35)	.022 (0,56)	.06 (1,5)	16.0 (406)	25 (7,6)
97-515	.76 (19,3)	.23 (5,8)	.06 (1,5)	.004 (0,10)	.375 (9,53)	.032 (0,81)	.08 (2,0)	24.0 (610)	25 (7,6)



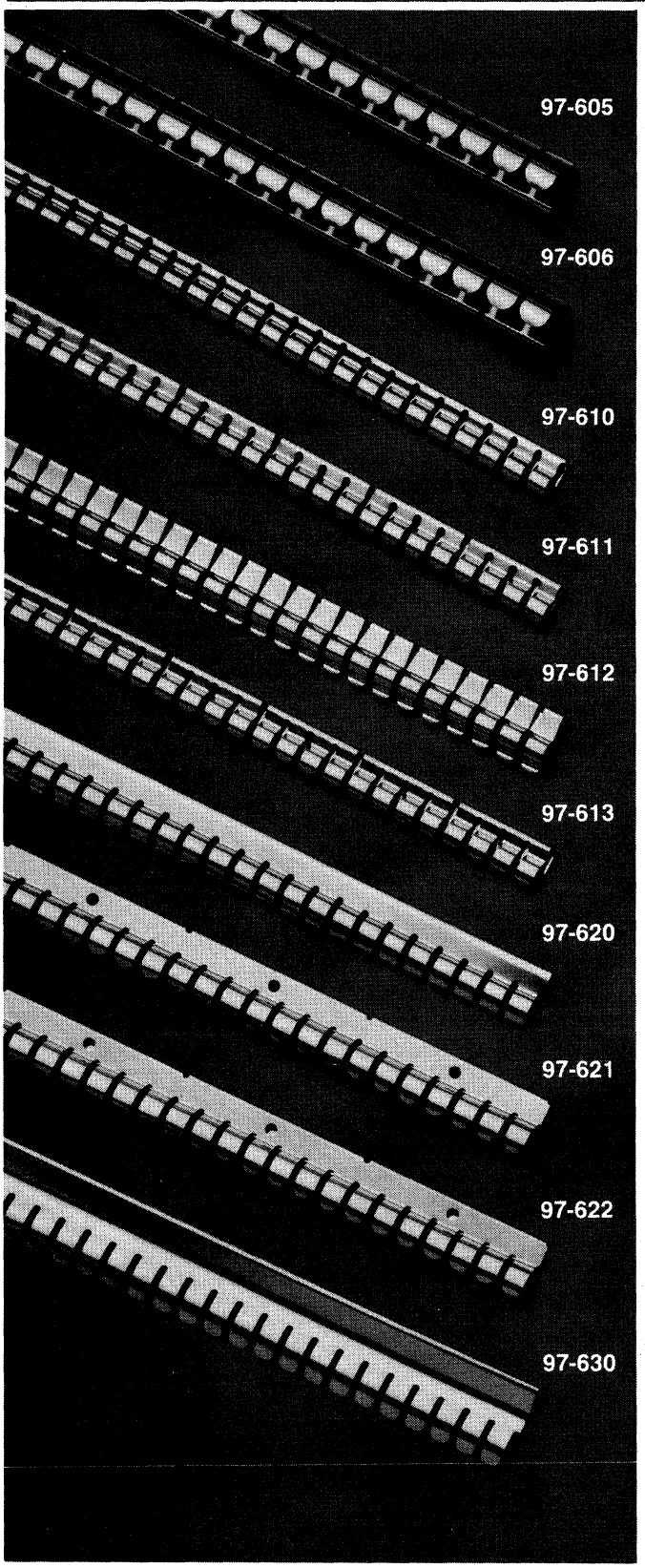


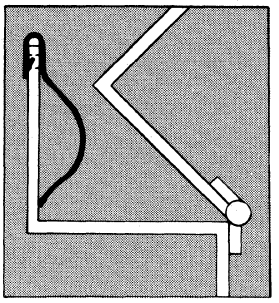
*Patent No. 3504095

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Metric units are indicated in parentheses.

Shielding Clip-On Gaskets

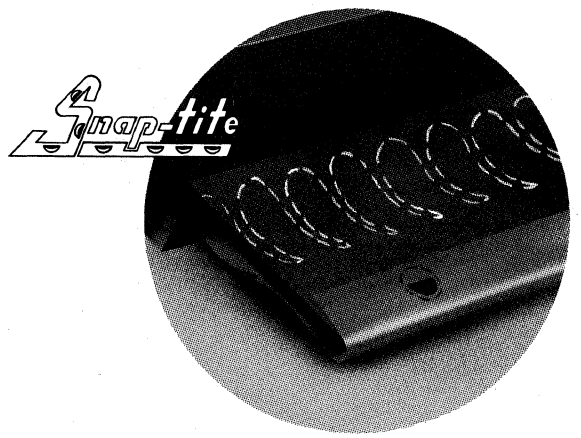




This series from Instrument Specialties is designed for use where high temperature or other considerations preclude the use of adhesive-mounted gasketing. Yet it provides the same shielding characteristics and effectiveness as our Sticky Fingers® mounted series.

Snap-tite™, with "D" lance

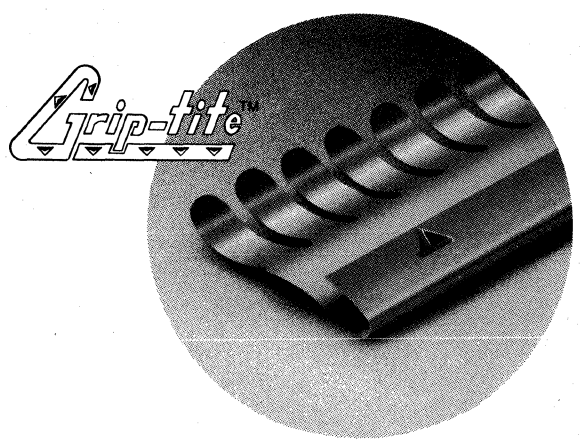
This configuration has been designed specifically to provide outstanding holding power. "D" lances snap into drilled or punched holes in the mounting surface to create a strong omnidirectional grip and excellent conductivity.



Grip-tite™, with "T" lance

Ideal for use with softer materials, such as aluminum, sharp "T" lances bite into the mounting surface and preserve electrical conductivity.

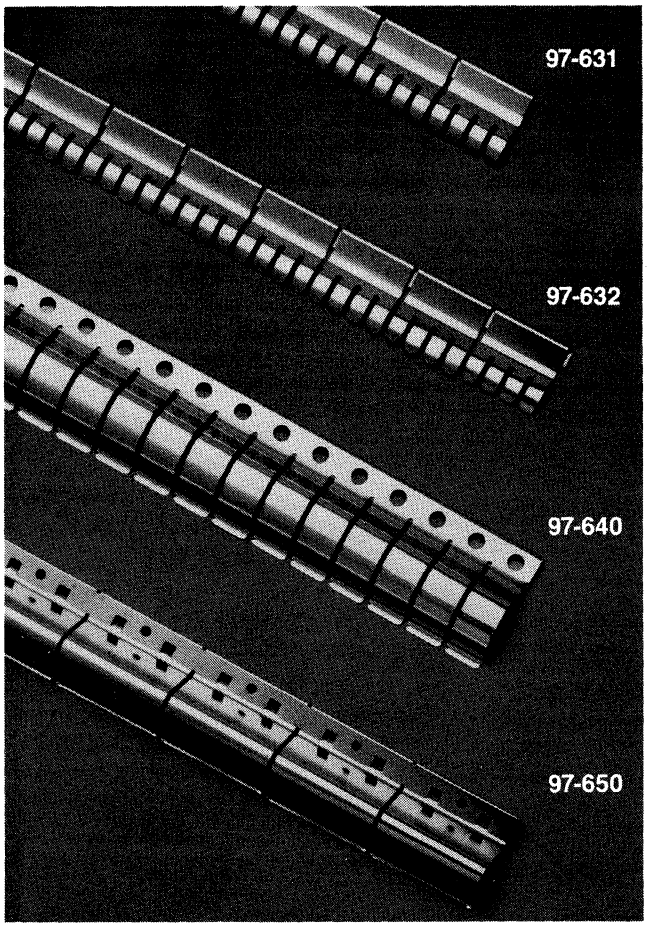
All configurations in these series are available in 16″ (406 mm) lengths and in all standard finishes (see page 30). Parts may be supplied with holes for cleaning and plating purposes. These holes will not affect the overall performance of the product.



Metric units are indicated in parentheses.

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Shielding — Clip-On Gaskets



Clip-On Series 97-605, 606

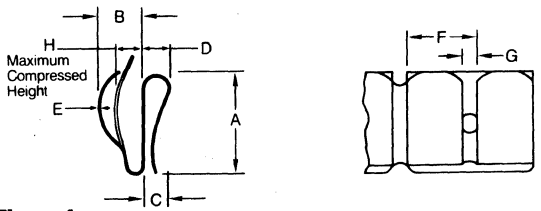
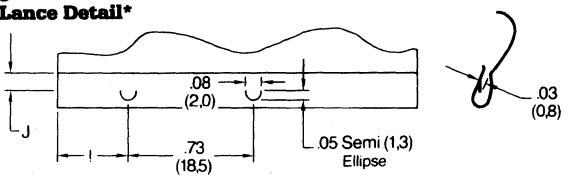
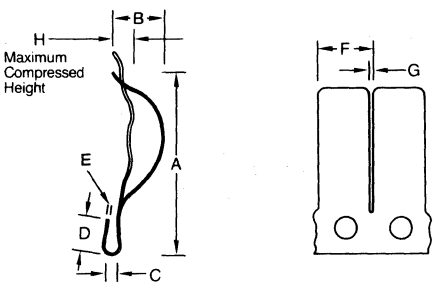


Figure 1.
D-Lance Detail*



All Others



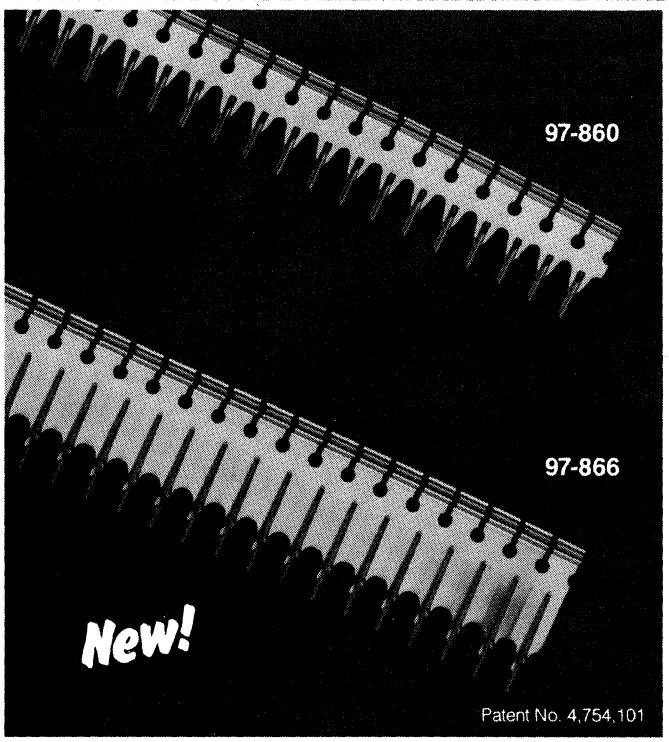
Clip-On Series

Series	A	B	C	D	E	F	G	H	Length	Clip-Tite CT	Square Lance SQ	Grip-Tite 'T' Lance GT	Snap-Tite 'D' Lance ST	'D' Lance Detail See Figure 1* I	'D' Lance Detail See Figure 1* J	Body Style Slot	Body Style Sol.
97-605	.38 (9,7)	.20 (5,1)	.07 (1,8)	.08 (2,0)	.005 (0,13)	.250 (6,35)	.040 (1,02)	.06 (1,5)	16.0 (406)			X X				X X	
97-606	.38 (9,7)	.20 (5,1)	.07 (1,8)	.08 (2,0)	.005 (0,13)	.250 (6,35)	.040 (1,02)	.06 (1,5)	16.0 (406)				X X	.25 (6,4)	.14 (3,6)	X X	
97-610	.30 (7,6)	.10 (2,5)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.187 (4,75)	.047 (1,19)	.06 (1,5)	16.0 (406)	X X							X X
97-611	.30 (7,6)	.10 (2,5)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.182 (4,62)	.047 (1,19)	.06 (1,5)	16.0 (406)			X X				X X	
97-612	.44 (11,2)	.10 (2,5)	.07 (1,8)	.19 (4,8)	.003 (0,08)	.187 (4,75)	.047 (1,19)	.02 (0,5)	16.0 (406)	X X	X X					X X	
97-613	.30 (7,6)	.10 (2,5)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.182 (4,62)	.047 (1,19)	.06 (1,5)	16.0 (406)				X X	.36 (9,1)	.05 (1,3)	X X	
97-620	.44 (11,2)	.08 (2,0)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.187 (4,75)	.047 (1,19)	.07 (1,8)	16.0 (406)	X X							X X
97-621	.44 (11,2)	.12 (3,0)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.193 (4,90)	.046 (1,17)	.06 (1,5)	16.0 (406)			X X				X X	
97-622	.44 (11,2)	.12 (3,0)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.193 (4,90)	.046 (1,17)	.06 (1,5)	16.0 (406)				X X	.31 (7,9)	.08 (2,0)	X X	
97-630	.60 (15,2)	.21 (5,3)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.187 (4,75)	.047 (1,19)	.07 (1,8)	16.0 (406)	X X							X X
97-631	.60 (15,2)	.21 (5,3)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.182 (4,62)	.047 (1,19)	.07 (1,8)	16.0 (406)			X X				X X	
97-632	.60 (15,2)	.21 (5,3)	.07 (1,8)	.19 (4,8)	.005 (0,13)	.182 (4,62)	.047 (1,19)	.07 (1,8)	16.0 (406)				X X	.36 (9,1)	.08 (2,0)	X X	
97-640	1.09 (27,7)	.26 (6,6)	.07 (1,8)	.28 (7,1)	.005 (0,13)	.375 (9,53)	.047 (1,19)	.05 (1,3)	16.0 (406)	X X							X X
97-650	.98 (24,9)	.40 (10,2)	.20 (5,1)	.30 (7,6)	.004 (0,10)	1.00 (25,4)	.030 (0,76)	.05 (1,3)	16.0 (406)	X X	X X					X X	

Metric units are indicated in parentheses.

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Shielding Printed Circuit Board Shields

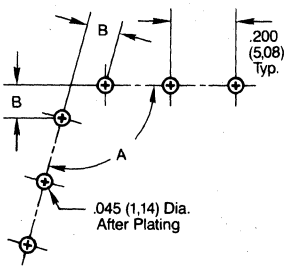


The PC Board Shield is a modular enclosure system which is solder-mounted on a circuit board. The enclosure controls EMI problems such as emissions, susceptibility, and cross-talk for a portion of the components. The shield can be used on any through-pin double or multi-layer board which is designed to accept it. The shield can conform to areas of any shape or size, including L and C shapes, that are difficult to shield with conventional methods. The standard fence material forms the walls of the enclosure, and the top is made of any flat metal. Since the top is flat, expensive forming tools are never needed. The cover is held in place by spring force alone, and can be removed without special tools to access the components. To facilitate soldering, both part numbers 97-860 and 97-866 are supplied with pre-plated Satin Tin finish (bare edges). Also available as mill finish phosphor bronze.

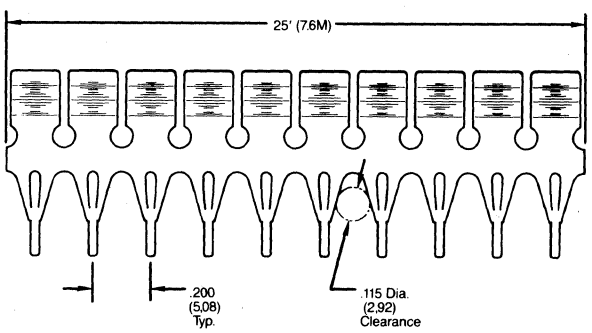
For further design consideration, please refer to pages 4 and 5 of this catalog, or contact us directly for engineering consultation.

PC Shield Mounting Dimensions

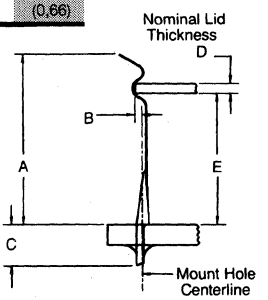
A Angle Deg.	B in. / (mm)	
30	.077	(1,96)
45	.092	(2,34)
60	.103	(2,62)
75	.109	(2,77)
90	.108	(2,74)
105	.101	(2,57)
120	.089	(2,26)
135	.072	(1,83)
150	.050	(1,27)
165	.026	(0,66)



Typical Mount Hole Pattern



Front View

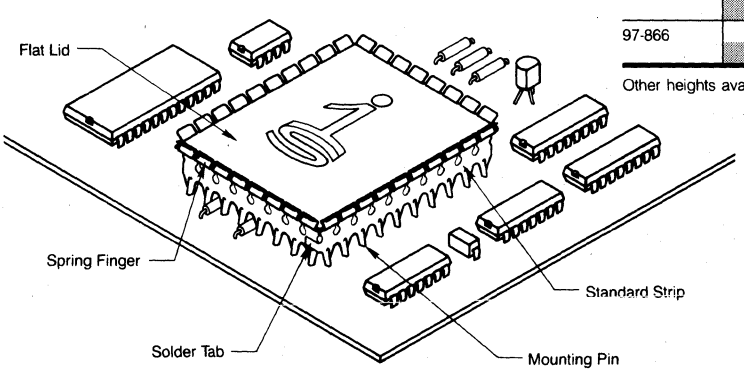


Side View

PC Shield Dimensions

Series	A	B	C	D	E
97-860	.52 (13,2)	.045 (1,1)	.12 (3,2)	.03 (0,8)	.40 (10,2)
97-866	.82 (20,8)	.045 (1,1)	.12 (3,2)	.03 (0,8)	.70 (17,8)

Other heights available upon request



Typical Mounting Configuration

Instrument Specialties Co., Inc.
Delaware Water Gap, PA 18327-0136
TEL: 717-424-8510; FAX: 717-424-6213

Metric units are indicated in parentheses.

CO-NETIC & NETIC magnetic shielding material

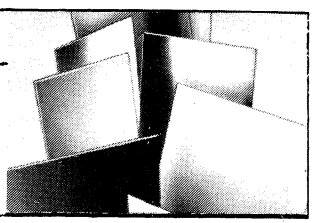
A complete stock of CO-NETIC (high permeability) and NETIC (high saturation) shielding alloys is available in foil and sheet form. Our engineering department will gladly assist you in the development of shield designs to meet your prototype or production requirements. Request catalog MG-5, material and fabrication guide for additional data and MIL specs.

MAGNETIC SHIELD CORP.

Perfection Mica Company
750 North Thomas Drive
Bensenville, Illinois 60106 U.S.A.
FAX: 312-766-2813, TWX: 910-256-4815
Tel: 312-766-7800

sheet stock: (standard—30″ x 120″) Shipped immediately from stock.

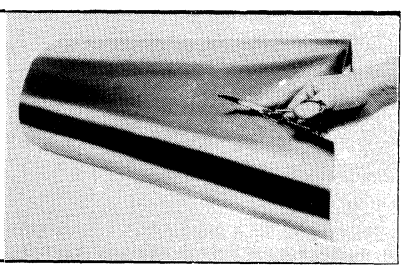
STD. THK. (Inch)	NETIC S3-6 ALLOY SHEET	CO-NETIC AA STRESS ANNEALED	CO-NETIC AA PERFECTION ANNEALED
.014			
.020	High saturation capability.	High permeability characteristics. Stress annealed for ease of fabrication. Must be final annealed for maximum attenuation performance. Also stocked in .100″.	High permeability characteristics. Perfection Annealed material has been fully hydrogen annealed for optimum magnetic shielding properties. No further annealing after fabrication is necessary if severe forming is avoided. 30″ × 60″ Standard size.
.025			
.030			
.040	.040 NETIC not stocked.		
.050			
.062	Also stocked in .095″		



foil stock: (standard coils—50 and 100 linear ft.)

STD. THK. (Inch)	NETIC PERFECTION ANNEALED WIDTH (Inch)	CO-NETIC PERFECTION ANNEALED WIDTH (Inch)
.002	—	4
.004	4	4
.004	15	15
.006	—	4
.006	—	15
.010	—	4
.010	—	15

Standard foils shipped immediately from stock. All sizes available with double-faced pressure sensitive tape and release coated liner. Foils can be slit to a minimum width of ¼″, with or without backing. Width tolerance ±.010. Backed and slit foils shipped one week after receipt of order. All foil is Perfection Annealed for maximum attenuation.



physical & magnetic data:

	CO-NETIC AA PERFECTION ANNEALED	CO-NETIC AA STRESS ANNEALED	NETIC S3-6
Specific Gravity	8.74	8.74	7.86
Coefficient of expansion per °C x 10^{-6}	12.6	12.6	13.7
Tensile strength in PSI x 10^3	64	85	42
Yield strength PSI x 10^3	18.5	33	27
Hardness, Rockwell B	50±5	70±5	50±5
Elongation in 2 inches, percent	27	32	38
Melting point (°F)	2650	2650	2790
Thermal conductivity (cal/sec/cm²/cm/°C) at 20°C	.138	.138	.118
Curie Temp. (°F)	850	850	1420

	CO-NETIC AA PERFECTION ANNEALED	CO-NETIC AA STRESS ANNEALED	NETIC S3-6
Electrical Resistivity ohms/cir mil foot	330	330	60
Microhm centimeters	55	55	11
Saturation Induction (Gauss)	8000	8000*	21,400
Initial Permeability	30,000	30,000*	200
Permeability at 200 gauss	135,000	135,000*	500
Maximum Permeability	450,000	450,000*	4000
Induction at μmax.	3000	3000*	8000
Coercive force, H_C, oersteds	.015	.015*	1.0

* Magnetic Properties after Hydrogen Anneal.

magnetic shields for photomultiplier tubes

Magnetic shields for all current photomultiplier tubes.

MAGNETIC SHIELD CORP.

Perfection Mica Company
750 North Thomas Drive
Bensenville, Illinois 60106 U.S.A.
FAX: 312-766-2813, TWX: 910-256-4815
Tel: 312-766-7800

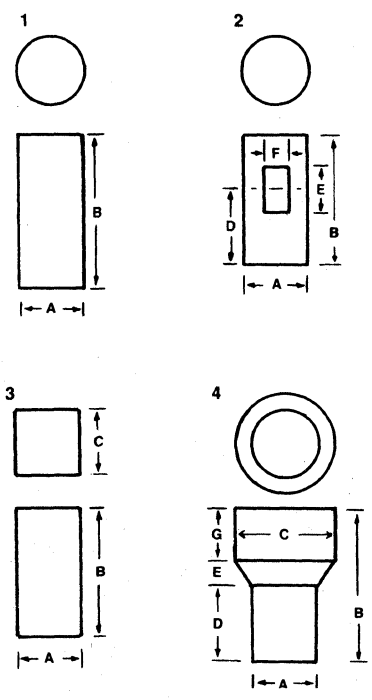
CO-NETIC magnetic shields improve the amplification characteristics of photomultiplier tubes by providing significant attenuation of magnetic fields. Effective shielding is ensured over a wide range of field intensities. When grounded, the shields provide protection against electrostatic interference.

CO-NETIC shields are highly resistant to shock and vibration. The shields have minimal retentivity and do not require periodic re-annealing.

Request catalog PM-5, which lists recommended shields for over 460 photomultiplier tubes.

MAGNETIC SHIELD DIMENSIONS

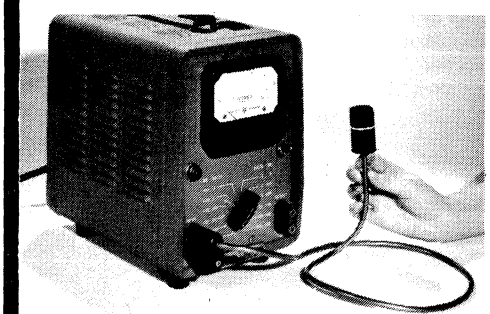
Shield	Drawing	A in.	B in.	C in.	D in.	E in.	F in.	G in.	Notes
05P20X05	3	2 3/64	2	2 3/64					b
05P25	1	1/2	2 1/2						b
06P30X06	3	5/8	3	5/8					b
06P35	1	5/8	3 1/2						b
07P23V1	2	3/4	2 3/8		1 1/4	1 1/8	1/4		a, b
08P27X09	3	13/16	2 3/4	7/8					b
10P30	1	1	3						
10P40	1	1	4						
11P30X11	3	1 1/32	3	1 1/32					
11P40X11	3	1 1/8	4	1 1/8					
12P25	1	1 1/4	2 1/2						
12P35	1	1 1/4	3 1/2						
12P45	1	1 1/4	4 1/2						
13P28V1	2	1 3/8	2 13/16		1 5/16	1 1/8	5/8		a
13P32V1	2	1 3/8	3 1/4		1 13/16	1 1/8	5/8		a
13P32V2	2	1 3/8	3 1/4		1 13/16	13/16	1 1/8		a
15P32V9	2	1 1/2	3 1/4		1 13/16	3/4	3/4		a, c
15P50	1	1 1/2	5						
15P60	1	1 1/2	6						
17P33V1	2	1 3/4	3 3/8		2 11/16	7/8	3/4		a
17P37	1	1 3/4	3 3/4						
17P42V1	2	1 3/4	4 7/32		3 21/32	7/8	3/4		a
17P45	1	1 3/4	4 1/2						
20P50	1	2	5						
21P40X29	3	2 1/8	4	2 7/8					
22P40	1	2 1/4	4						
22P50	1	2 1/4	5						
22P60	1	2 1/4	6						
22P70	1	2 1/4	7						
22P80	1	2 1/4	8						
23P40X32	4	2 3/8	4	3 1/4	2	1		1	
23P50X32	4	2 3/8	5	3 1/4	2 3/4	1 1/8		1 1/8	
23P52X37	4	2 3/8	5 1/4	3 3/4	2 13/16	1 1/4		1 3/16	
23P53X36	4	2 3/8	5 3/8	3 5/8	3			2 3/8	
23P55X32	4	2 3/8	5 5/16	3 5/32	3 3/8	11/16		1 1/2	
23P61X37	4	2 3/8	6 1/8	3 3/4	3 1/4	3/4		2 1/8	
23P65X32	4	2 3/8	6 1/2	3 1/4	3 3/4	1 1/8		1 5/8	
23P68X57	4	2 3/8	6 7/8	5 3/4	3	1 7/8		2	
23P75X53	4	2 3/8	7 1/2	5 3/8	3 3/4	1 7/8		1 7/8	
23P90X77	4	2 3/8	9	7 3/4	3 15/16	1 21/32		3 13/32	
23P101X57	4	2 3/8	10 1/8	5 3/4	1/2	2 3/4		6 7/8	
25P40	1	2 1/2	4						
25P50	1	2 1/2	5						
25P60	1	2 1/2	6						
25P70	1	2 1/2	7						
25P80X52	4	2 1/2	8	5 1/4	3 1/2	1 1/2		3	
27P60	1	2 3/4	6						
27P107X85	4	2 3/4	10 3/4	8 1/2	4	2 3/4		4	
30P70	1	3	7						
32P80	1	3 1/4	8						
32P100X55	4	3 1/4	10	5 1/2	3 1/2	1		5 1/2	
35P70	1	3 1/2	7						



Unless otherwise noted:
Dimensions — All inside measurements.
Material — .040" (1 mm) Thick Co-Netic AA alloy, high permeability.
Finish — Black baked enamel; texture outside, flat inside.
a — Upper end closed.
b — Material — .030" (0,76 mm) Co-Netic AA.
c — Round window.

complete magnetic shielding accessories & mica

MAGNETIC SHIELD CORP.
Perfection Mica Company
750 North Thomas Drive
Bensenville, Illinois 60106 U.S.A.
FAX: 312-766-2813, TWX: 910-256-4815
Tel: 312-766-7800

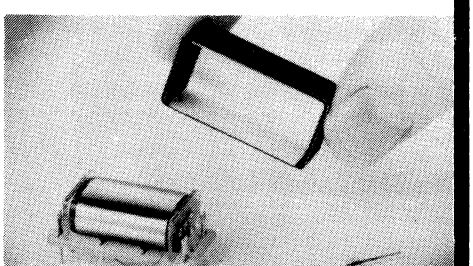


Lab Kits & Probes

Lab Kit contains assorted CO-NETIC and NETIC shielding materials, double-faced pressure sensitive tape for shield construction and 20 millivolts/gauss A.C. magnetic pickup probe $129.50
Probe only, 20 mV/gauss, axial $49.50
Probe only, 60 mV/gauss, axial (shown) or transverse $79.50
Request Lab Kit catalog LK-2, Probe catalog EP-3.

Component Shields

Full time engineering staff available for consultation on shielding problems. Magnetic Shield Corporation is also the preferred source for custom shields to your specifications. Extensive standard and special tooling provide fast shipment. Call for design assistance or send print for prompt quotation.

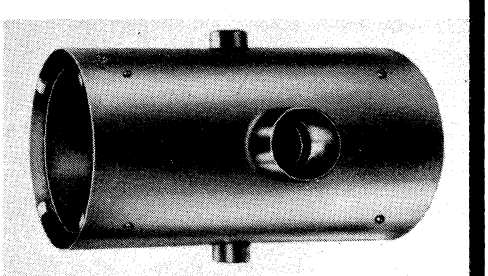


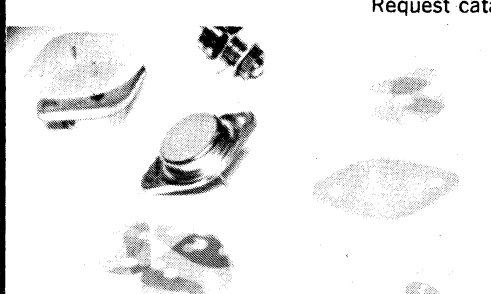
Cable & Braided Sleeving

Our patented, Inter-8 Weave configuration of four #24 AWG wires provides superior attenuation over twisted pair. Insulation choice is PVC or ETFE. Available unshielded or with braided CO-NETIC for magnetic shielding or copper for R.F. shielding. CO-NETIC braided sleeving stocked in 1/4" and 1/2" I.D. Request catalog WC-2.

Zero Gauss Chambers

Zero gauss chambers provide the ultimate in magnetic shielding. Magnetic Shield Corporation's general-purpose zero gauss chamber offers a significant reduction in both static and time varying fields found in laboratory and research environments. Degaussing coils can be furnished, and a Helmholtz coil system can be incorporated to generate known fields. Three concentrically spaced CO-NETIC chambers with closed ends and removable covers are provided. Placement of openings is optional. Attenuation in excess of −60 db is typical.
Request catalog ZG-2





Mica Insulators

Available in sheet, wafer, and tubing form. Clear, natural and built-up sheet stock thicknesses from .002" to .062". Save tooling expense on a wide variety of fabricated parts, including semi-conductor insulators in .002" to .003" thickness with .002" hole tolerances. Excellent heat resistance and high dielectric strength provide improved breakdown protection and increased efficiency of electronic components. Request catalog K-14.

Do you need magnetic shielding as good as MμShield®?

Only if you need optimum attenuation.

Unless your design calls for magnetic shielding that meets the most stringent specs, you may not need to consider Bomco's MμShield materials.

But, if you need custom shielding with maximum attenuation or tubing with totally uniform permeability, you do need MμShield. And you can get MμShield materials only from Bomco, a company with more than 35 years of experience.

Bomco's MμShield Division can satisfy the most demanding applications — aerospace, nuclear and electronic — with a wide variety of custom shields, materials, and services.

MμShield cathode ray tube shields.

Assure high resolution. For use in special military applications. Also suitable for commercial, industrial, and laboratory applications.

MμShield photomultiplier tube shields.

Ideal for electro-optical devices of all kinds, CAT- and PET-scan machines, and TV cameras.

MμShield custom electronic components shields.

For use in computer-related technology such as disk drives, printed circuits, and PC terminals.

MμShield special application shields.

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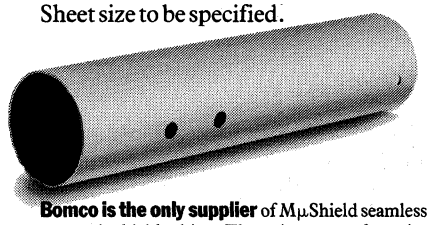
Coils, sheets and tubing in stock

- High saturation shielding. Permeability ranges from 200 to 50,000. Saturation point between 18,000 and 20,000 gauss.
- Medium permeability shielding. Permeability from 12,500 to 150,000. Saturation point approximately 15,000 gauss.
- High permeability shielding. Permeability from 80,000 (at B-40) to 350,000. Saturation point approximately 7,500 gauss.
- Dimensions:

Coils — .004", .006", .010" thickness; 8" and 15" widths. Minimum order $100.

Sheets — Cold rolled annealed, .015" to .060" thickness. Full sheet 30" × 10'. Minimum order 30" × 36".

Hot rolled, .090" to .265" thickness. Sheet size to be specified.



Bomco is the only supplier of MμShield seamless magnetic shield tubing. The unique manufacturing process eliminates the non-uniformity of permeability inherent in welded tubing.

Tubing — .10" to 2.00 ID. Wall thicknesses .010" to .060". Lengths to 20'.

Heat treating service.

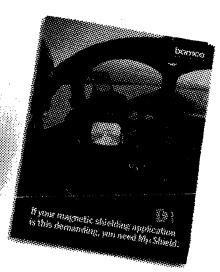
Gives magnetic materials optimum permeability with low shock-sensitivity. Permeability and uniformity of MμShield-fabricated parts are guaranteed.

Special consultation services.

We'll do more than just give you a quote. We'll do everything from on-site input meetings to prototyping, testing, and manufacturing. When your designs require optimum shielding, send us your specs and we'll be happy to review your application.

Now when you need magnetic shielding as good as MμShield, you don't need to worry.

Call or write Bomco, Inc., MμShield Products Division, PO Box W, Dept. E, 103 Madison Street, Malden, MA 02148. 508/321-4410. Fax 508/324-9563.



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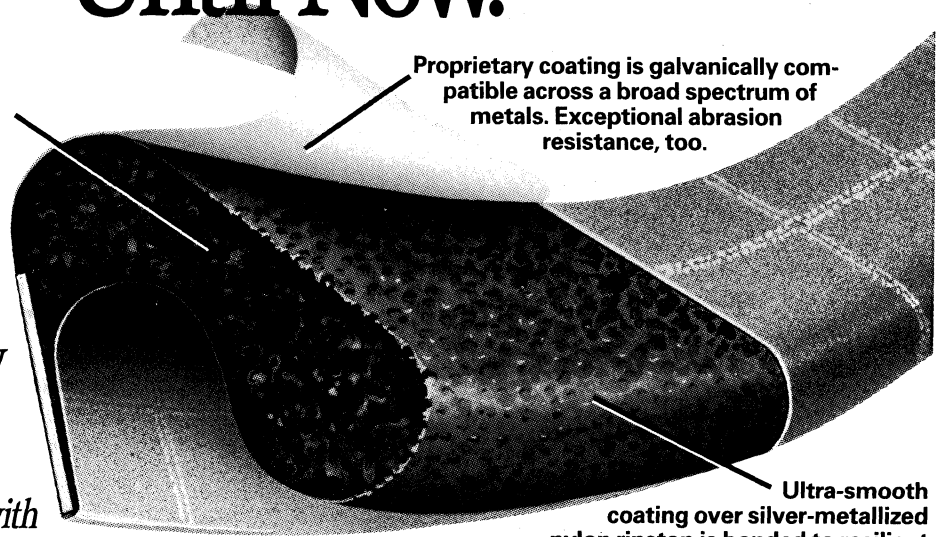

Introducing the new SCHLEGEL®-C^2 shielding gasket.

Galvanically compatible with virtually any metal or metallic coating, under almost any operating condition.

Specifying an EMI gasket is now simple. Because the patented SCHLEGEL–C^2 shielding gasket spans the spectrum of galvanic compatibility, from noble to active metals. No worry about corrosion, even under severe operating conditions. No loss of shielding efficiency.

The reason is an ultra-smooth, non-metallic coating over conductively clad urethane foam. The soft, spongy gasket fills big gaps, while the revolutionary coating conforms to even the smallest irregularities in metal surfaces. The result is a highly efficient shielding gasket and a superb environmental seal. For the design life of your equipment.

SCHLEGEL–C^2 gasketing is available in more than 20 profiles and in a variety of attachment methods. For a free sample or applications assistance, call or write now.

Sandwich construction at 700x magnification shows urethane foam at bottom of photo, clad with conductive silver-metallized ripstop (circular fiber ends). The entire assembly is encapsulated in a conductive, galvanically compatible coating.

At 250x magnification and after 100,000 wear cycles, the equivalent of being shipped three times cross-country, the outer coating of the gasket shows only minimal abrasion. Shielding efficiency is unaffected.

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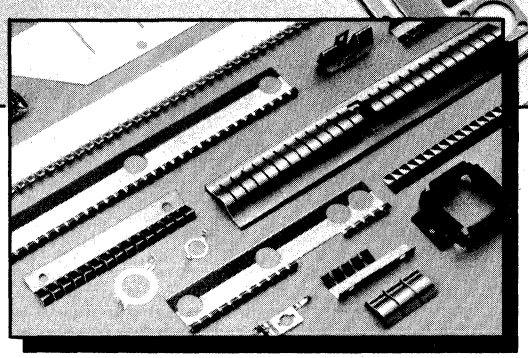

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From high volume requirements using progressive dies to prototype and low quantities utilizing photo-etch fabrication, Tech-Etch can be your source.

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Tech-Etch manufactures the most complete line of shielding products in the industry to serve today's requirements in both the commercial and military markets. As a leading designer of shielding products for over 35 years, Tech-Etch is in a position to provide not only a broad range of stocked catalog items, but to offer a source for your custom-designed specialty products.

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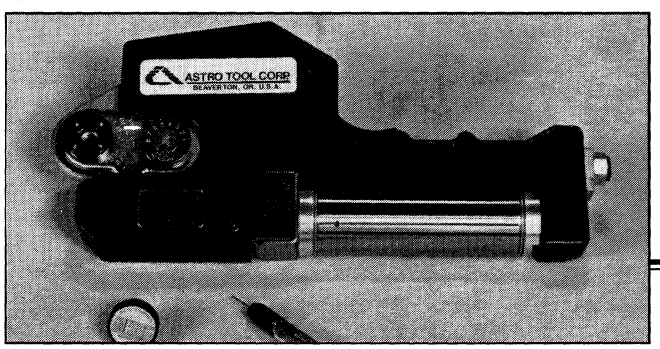
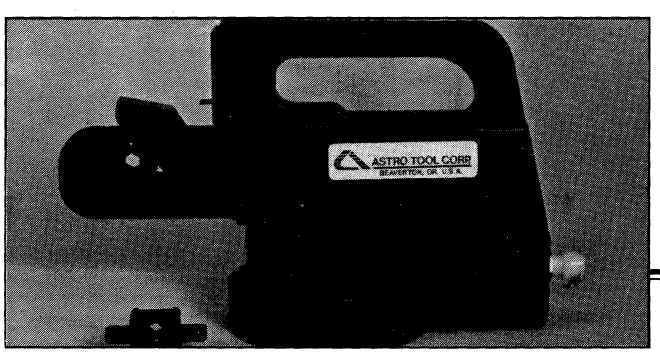
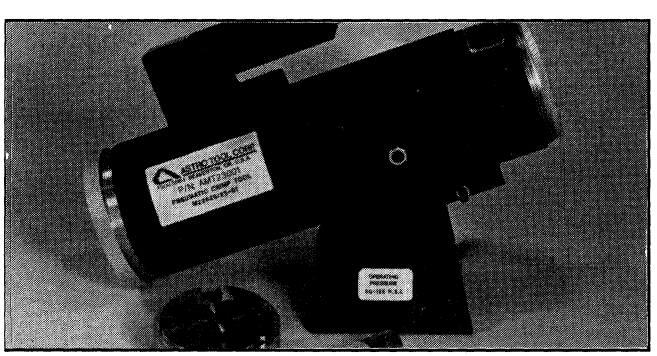


Pneumatic Step Adjustable Crimp Tool
Available in M22520/2, Part #621100 and M22520/7,Part #621101 Trigger activated, self contained system accepts M22520 positioners and meets basic Mil-C-22520 performance requirements.



Pneumatic Hex Die Crimp Tool
A trigger activated, self contained system, accepts all M22520/5 standard dies and meets basic Mil-C-22520/5 Performance requirements. Part #621200



Heavy Duty Pneumatic Crimper
Meets all Mil-C-22520/23 specifications with interchangeable dies and locators. Capable of crimping size 8 through 4/0 contacts with no booster required for larger size contacts. Part #23001

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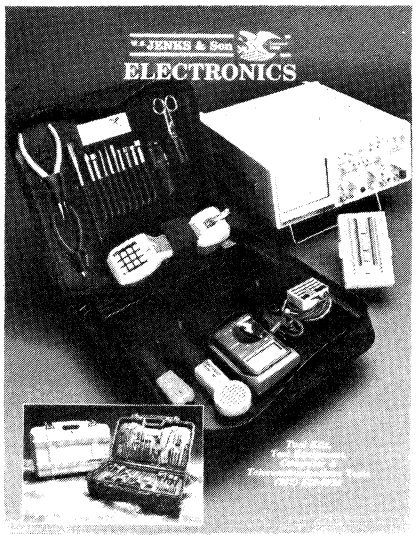

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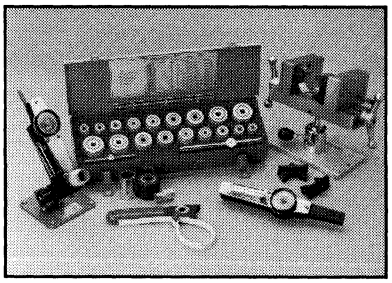
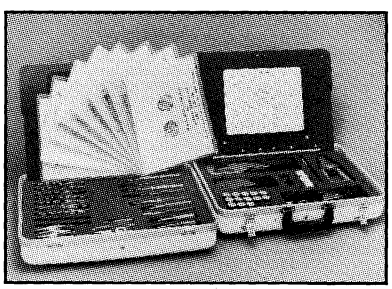


BACKSHELL ACCESSORY TOOLS (BETA™ LINE)

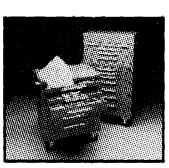
For holding circular connectors during the installation and removal of accessories (backshell, strain relief, or EMI/RFI shielding hardware). The BETA™ LINE includes the following:

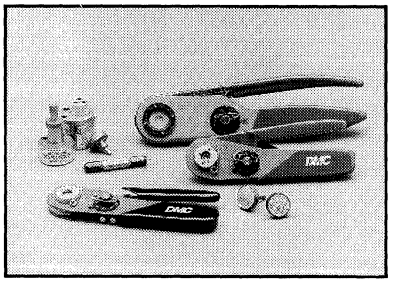
- Connector holding adaptors
- Strap wrench
- Soft jaw vise for circular parts
- Soft jaw pliers
- Torque meters and wrenches
- Tool sets and custom application kits to cover most connector series.



COMPLETE WIRING SYSTEM SERVICE KITS

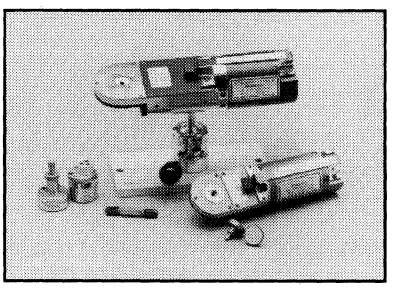
The DMC Wiring System Service Kits are a complete tooling and information system which includes all the necessary tools, application instruction diagrams, and tool selection charts to support a complete wiring system. All this is organized and packaged in a durable case or cabinet. Service kits are presently available for many military and commercial systems including all types of aircraft, weapon systems, ground vehicles, and marine equipment.





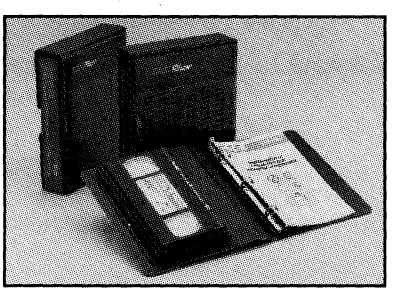
INDENT CRIMPING TOOLS

For crimping machined electrical contacts.
AF8 (M22520/1-01)
AFM8 (M22520/2-01)
MH860 (M22520/7-01)
Plus many commercial tools and accessories.



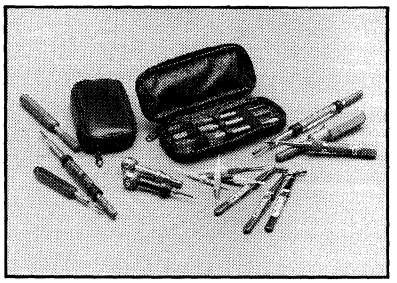
PNEUMATIC CRIMPING TOOLS

Power actuated tools for most crimping applications. Heads, dies and other accessories are interchangeable with DMC hand tools.



VIDEO TAPE TRAINING SERIES

For connector and wiring system assembly. Connector identification and the use of assembly tools are explained and visually reinforced.

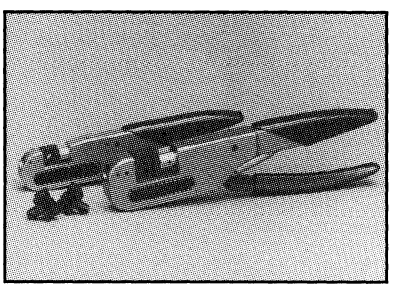


INSTALLING AND REMOVAL TOOLS (MIL-I-81969)

For assembly or disassembly of circular, rectangular and "D" connectors in both military and commercial versions. Below is a partial MS listing:

MS 3159	MS 17805	MS 27534
MS 3160	MS 17806	M 83723
MS 3447	MS 24256	MS 90455
MS 3448-001	MS 27495	MS 90456

Plus many commercial tools.



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For crimping coaxial and shielded connectors, terminals, splices, and other formed terminating devices.
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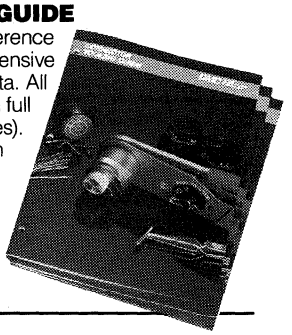
Plus many interchangeable dies and accessories.

FREE CONNECTOR TOOLING GUIDE

With cross reference charts and extensive application data. All are featured in full color (42 pages). Available upon request.



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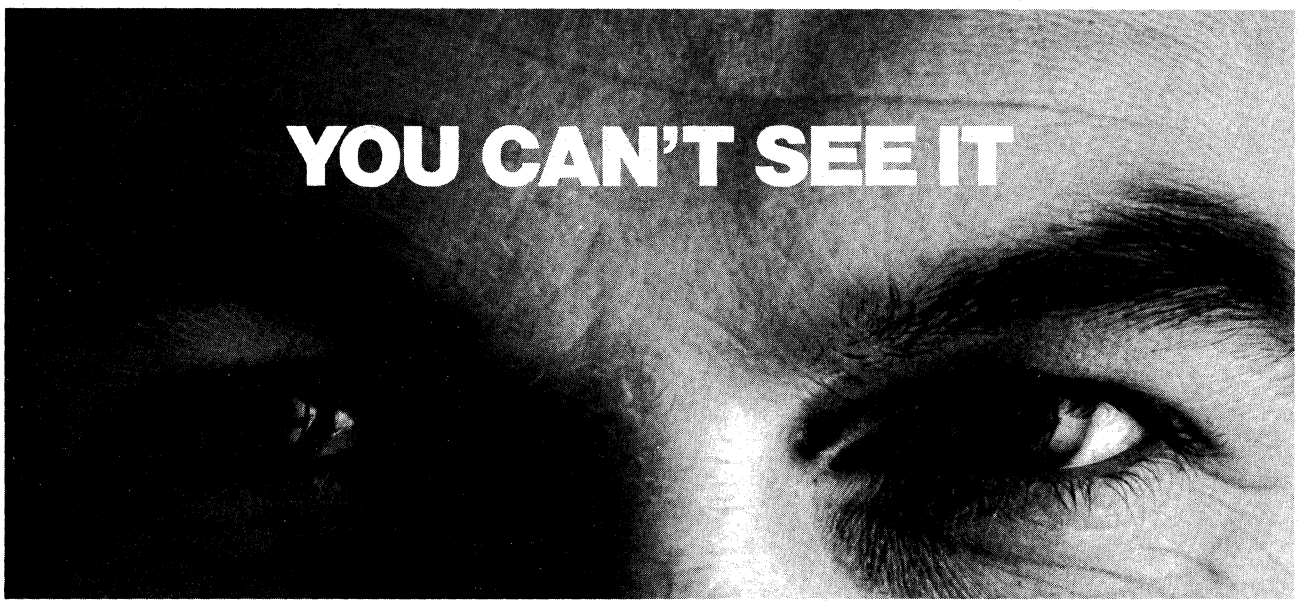


BUT IT CAN DESTROY YOUR BEST DESIGN

The next time your performance is measured by the success of your system's design, take a closer look at the critical link: will the shielded cable you select maintain signal integrity? At Belden, we're working to protect this critical link.

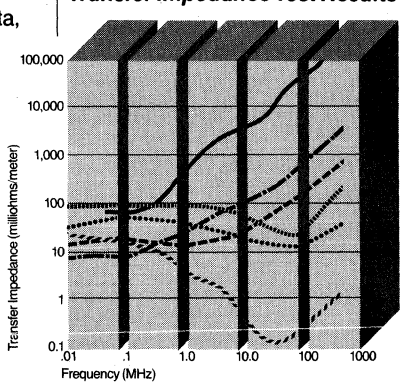
Shield Effectiveness

With the convergence of data, audio and video transmissions, one of the greatest challenges is to preserve the integrity of each signal. This evolution of technology, coupled with the need to comply with FCC regulations has created a growing demand for sophisticated cable shielding.

Belden responds to these demands with innovative shielding designed to meet the highest performance standards in the industry—including military TEMPEST requirements.

Belden helps you control interference and protect signal integrity with innovative shielded cable

Transfer Impedance Test Results



The lower the value of transfer impedance, the more effective the shielding.

Test Methods Protect Your System

To help you define interference problems, Belden's Technical Research Center evaluates the development, implementation and refinement of shields and shield effectiveness testing. Our Transfer Impedance Test is but one of many rigorous tests employed by Belden engineers. The procedures we use help you select the proper shielded cable that results in cost-effective system performance.

Effective Assistance

Belden has recently published a *Cable Shield Performance and Selection Guide*. It's free, and it helps you define your interference problem, acquaints you with current FCC regulations, and familiarizes you with the trade-offs associated with different shield designs and Belden's various test procedures for measuring shielding effectiveness. Shield performance results are detailed from each test to properly guide your cable selection.

Contact Belden today for your free personal copy. Belden Wire and Cable, P.O. Box 1980, Richmond, IN 47375. Phone: 317-983-5200.

There is no equal.™

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See Belden's listing on page C•1768-C•1819 in EEM

COOPER INDUSTRIES BELDEN

ABBREVIATIONS FOR WIRE & CABLE PRODUCT SELECTION GUIDE

CODE/EQUALS		CODE/EQUALS		CODE/EQUALS		CODE/EQUALS	
AP	Aluminized Polyester	FPE	Foamed Polyethylene	NYL	Nylon	RUB	Rubber
BC	Bare Copper	FRSR	Fire Resistant Silicone Rubber	PCA	Polychloroalkene	SBR	Synthetic Rubber
BCB	Bare Copper Braid	GLS	Glass	PE	Polyethylene	SHLD	Shielded
BCCS	Bare Copper Coated Steel	IRPVC	Irradiated PVC	POE	Polyethylene	SPC	Silver Plated Copper
BTC	Braided Tinned Copper	KYN	Kynar	POP	Polypropylene	TC	Tinned Copper
DRN	Drain Wire	MYL	Mylar (DuPont™)	PVC	Polyvinylchloride	TEF	Teflon
EPR	Synthetic Rubber	NEO	Neoprene	REEL	Cord on Reel	TFG	Teflon/Fiberglass
FLR	Filler	NPC	Nickle Plated Copper	RTCL	Retractile Cord	XLP	Cross Linked Polyethylene
						**	Specs Not Shown On Page
						–	Not Applicable

MULTICONDUCTOR CABLE

Manufacturer	Starting EEM Page No.	Number of Conductors (range)	Conductor (AWG range)	Insulation (type)	
				Primary	Secondary
American Insulated Wire Corp.	C•1763	2 - 100	26 - 10	PVC	Rubber
Amphenol/Spectra Strip	C•1765	10 - 64	32 - 14	PVC, TPE, Halogen Free	
Anco Electronics	C•1766	Var.	Var.	PVC, P-P, P-U, Neoprene	Var.
Belden Electronic Wire & Cable	C•1768	2 - 50	20 - 18	PVC, SR-PVC, Polyethyl	Chrome PVC Jacket
Brim Electronics	C•1820	1 - 665	38 - 16	TEF	
COMM/SCOPE Inc.	C•1831	2 - 8	26 - 16	FEP or PE	
Consolidated Electronic Wire & Cable	C•1840	2 - 60	25 - 14	PVC	PVC
Daburn Electronics & Cable	C•1848	1 - 64	28 - 16	PVC, Telflon	PVC, Teflon, TPE
Globtek	C•1859	6 - 240	40 - 18	PVC	PVC
GSI Corp.	C•1860	2 - 200	40 - 12	Any	Any
ISL Products Int'l Ltd.	C•1864	2 - 50	30 - 16	Standard and Custom	PVC/Polypropylene
Kycon	C•1867	Var.	Var.	Var.	Var.
LZR Elecronics Inc.	C•1868	2 - 8	TC 28 - 26		
Manhattan Electric Cable Corp.	C•1873	2 - 100	28 - 12	PVC	PE
Panel Components	C•1910	3, 5	18 - 16 - 14	PVC, RUB	
Phoenix Wire Inc.	C•1915		44 - 24	TEF	FEP
Precision Interconnect	C•1917	2 - 256	42 - 22	Teflon	Polyethylene
Shogyo	C•1920	up to 36	32 - 16	PVC	PU or PP
Virginia Plastics	C•1923	2 - 15	38 - 20	PVC, PE	PVC, TEF
Welco Wire & Cable Inc.	C•1926	5 - 64	30 - 8 TC	RUB	SBR

DATA CABLES

Manufacturer	Starting EEM Page No.	Number of Conductors	Conductor (AWG range)	Shielding Material (type)	Insulation (type)	
					Primary	Jacket
American Insulated Wire Corp.	C•1763	2 - 50	26 - 12	Foil, Braid	Polyethylene	PVC
Anco Electronics	C•1766	Var.	Var.	Var. (braid)	Var. (PVC, PP, PU), Neoprene	Var.
Belden Electronic Wire & Cable	C•1768	2 - 204	28 - 12	Aluminum-Poly, Copper Braid	SR-PVC, Polypropylene	Chrome PVC
Brim Electronics	C•1820	1 - 120	38 - 18	Braid (Copper, TC), Aluminum-Mylar-Foil	Fiberglass/ Silicone, PVC PE, Polypropylene	Nickel-plated braid, Chrome-PVC
COMM/SCOPE Inc.	C•1831	2 - 8	26 - 16	Foil or Braid	FE or PE	PVC, PE, FEP, Kynar
Consolidated Electronic Wire & Cable	C•1840	1 - 102	24 - 22	Copper braid, Aluminum/Mylar Foil	Semi-rigid PVC, PE	PVC
Daburn Electronics & Cable Corp.	C•1848	2 - 64	28 - 16	Braided copper, Polyester foil	PVC, Teflon	PVC, Teflon
Globtek	C•1859	6 - 120	40 - 9	Aluminum, Copper	PVC	PVC
GSI Corp.	C•1860	2 - 200	40 - 12	Any	Any	
ISL Products Int'l Ltd.	C•1864	up to 50		Mylar, Foil, Serve	Standard	Standard
Kycon	C•1867	Var.	Var.	Var.	Var.	Var.
LZR Electronics Inc.	C•1868	3 - 37	TC 28 - 26	Var.	Var.	Var.
Manhattan Electric Cable Corp.	C•1873	2 - 100	28 - 14	Foil or Foil/braid	PVC, PE, Foam PE	PVC
National Wire & Cable Corp.	C•1886	5 - 60 Singles, 5 - 60 Twisted pairs	24 - 20	Tinned copper overall or unshielded	Vinyl	Abrasion-resist Vinyl
		2 - 60 Singles, 2 - 27 Twisted pairs	24 - 18	Foil or Braid overall	PVC	PVC
		7 - 102 Singles, 7 - 60 Twisted pairs	22 - 12	Tinned copper braid overall, or unshielded	Vinyl	Abrasion-resist Vinyl
		4 - 50 Pairs, 1 - 48 Pairs	24	Aluminum Mylar foil with Tinned copper overall or individually shielded		Vinyl
		2 - 60 Singles, 2 - 27 Twisted pairs	24 - 18	Overall Aluminum Mylar foil option: tinned copper braid	PVC	Black PVC Thermoplastic
		2 or 3		Foil-shielded, pairs or trios	PVC	Flame-resist PVC
Virginia Plastics	C•1923	2 - 10 pairs	32 - 20	Foil, Braid, Spiral	PVC, FPE	PVC, TFE, TPR
Welco Wire & Cable Inc.	C•1926	1 - 100	54 - 6 TC SPC	AP, BC, TC, BTC, MYL	TEF, PVC, PE	PVC, Polyamide TEF

HOOKUP WIRE

Manufacturer	Starting EEM Page No.	Conductor (type)	Conductor (AWG range)	Insulation (type)	
				Primary	Secondary
ABL Electronic Supply Inc.	C•1760	Solid, Stranded, Bonded, Tinned copper	32 - 10	PVC	
American Insulated Wire Corp.	C•1763	Copper	26 - 2	PVC	Crosslinked Polyethylene
Brim Electronics	C•1820	Solid, Stranded	38 - 16	8c PVC	
Consolidated Electronic Wire & Cable	C•1840	Tinned CU Solid or Stranded	30 - 10	IRR/PVC, PVC Silicone rubber	Glass braid, Kynar
Daburn Electronics & Cable Corp.	C•1848	TC, Silver plated copper Nickel plated copper	36 - 10	PVC, TFE, Glass, Silicone rubber	TFE, PVC Glass
Globtek	C•1859	4L1007 - 2969	40 - 8	PVC & Nylon	PVC
ISL Products Int'l Ltd.	C•1864	Solid/Stranded	30 - 16	PVC/Polyurethane	PVC/Polypropylene
Judd Wire Inc.	C•1865	Tinned copper	210 - 30	XLPVC	XLPE
Manhattan Electric Cable Corp.	C•1873	UL, CSA	32 - 6	PVC	PE
Molecu-Wire	C•1875	Round, ribbon	0.045 in - 0.0004 in.	Plating enamels	Polyester, Polynylon, Epoxy, Polyvinyl, Polyvinyl butyral
MWS Wire Industries	C•1882	Copper, Aluminum Magnet wire: ribbon, square, twist, rectangle parallel bonded	14, 52 - 16	Film enamel, one-to-four coats	"bondable overcoats"
National Wire & Cable Corp.	C•1886	Single, Stranded, or Solid	32 - 6	Vinyl	Nylon
Omega	C•1907	Copper	56 - 6	Nylon	Teflon
Phoenix Wire Inc.	C•1915	Copper, Silver plated copper	42 - 30	TFE multi-layer	TEF
Rowe Industries Inc.	C•1922	Copper strand, Copper plated Copper strand, Tin plated	22 - 10	Silicone	
Welco Wire & Cable Inc.	C•1926	BC, TC, SPC	32 - 14	IRR, PVC, TEF, KYN	NYL, PVC

SINGLE CONDUCTOR COAXIAL

Manufacturer	Starting EEM Page No.	Normal Impedance (ohms)	Conductor (AWG)	Shielding Material (type)	Insulation (type)	
					Primary	Jacket
Anco Electronics	C•1766	Var.	Var.	Var.	Var.	
Belden Electronic Wire & Cable	C•1768	200 - 12	30 - 11	Foil & Aluminum Braid, Copper braid	Cellular Polyethylene, PE	PVC
COMM/SCOPE Inc.	C•1831	50, 75, 78, 93, 100, 125	23, 20, 18	Foils & Braid Tinned copper, Copper, Aluminum	FEP, PE	PVC, PE, FEP
Consolidated Electronic Wire & Cable	C•1840	50 - 125	22 - 14	Copper braid, Copper, Aluminum Foil/Mylar	FEP, Teflon, PE	FEP, Teflon, PVC
Daburn Electronics & Cable Corp.	C•1848	28 - 65	26 - 16	Silver plated copper	Teflon	Teflon, Fiberglass braid
Globtek	C•1859		40 - 16			
ISL Products Int'l Ltd.	C•1864	50 - 75		Mylar, Foil, Braided copper	PVC, TPR, Other	Standard
Manhattan Electric Cable Corp.	C•1873	50, 75, 93, 125, 150		Bare copper	PE	PVC
Precision Interconnect	C•1917	50 - 110	40 - 26	Braid, Serve, Foil	Teflon	PVC
Rowe Industries Inc.	C•1922		22 - 6		Extruded Silicone	Silicone, Neoprene, PVC
Shogyo	C•1920	75	26	Foil, Mylar, & Wrap	options available	options available
Welco Wire & Cable Inc.	C•1926	50 - 125	BC, BCCS	BC, TC, SPC, Aluminum Foil	PE, TEF	PVC

CABLE ASSEMBLIES

Manufacturer	Starting EEM Page No.	Subminiature "D" Assemblies					GPIB	Ethernet Transc.	Trunk	Parallel Interface	DIN Keyboard			Modular Keyboard	
		9 Pos.	15 Pos.	25 Pos.	37 Pos.	50 Pos.					3 Pos.	5 Pos.	8 Pos.	Straight	Retract.
Anco Electronics	C-1766	√	√	√	√	√			√		√	√	√		
Belden Electronic Wire & Cable	C-1768	√		√		√	√	√	√						
Daburn Electronics & Cable Corp.	C-1848													√	√
Globtek	C-1859	√	√	√	√	√				√	√	√	√	√	√
GSI Corp.	C-1860	√	√	√	√	√									
ISL Products Int'l Ltd.	C-1864	√	√	√	√	√								√	√
Kycon	C-1867	√	√	√	√	√			√						
LZR Elecronics Inc.	C-1868	√	√	√	√				√		√	√	√		
Manhattan Electric Cable Corp.	C-1873	√	√	√	√	√	√	√	√						
Molex Inc.	C-1880		√	√	√										
Shogyo	C-1920	√	√	√	√	√					√	√	√	√	√

POWER CORDS

Manufacturer	Starting EEM Page No.	3 Conductor		Detachable 3 Conductor		2 Conductor		Jumper	Retractable	Hospital	Extension
		Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded				
Belden Electronic Wire & Cable	C-1768	√	√	√	√						
Brim Electronics	C-1820	√	√	√	√				√		
Daburn Electronics & Cable Corp.	C-1848		√			√	√		√		
General Cable	C-1855	√	√	√	√	√	√	√	√	√	√
Globtek	C-1859	√	√	√	√	√	√	√	√	√	√
GSI Corp.	C-1860	√	√	√	√	√	√	√	√	√	√
ISL Products Int'l Ltd.	C-1864			√	√	√	√	√	√	√	√
Kycon	C-1867	√	√	√	√			√	√		
LZR Elecronics Inc.	C-1868	√	√	√	√				√		
Manhattan Electric Cable Corp.	C-1873	√	√								
Panel Components	C-1910	√	√	√	√	√	√	√	√		√
Power Dynamics	C-1916							√			
Shogyo	C-1920	√	√	√	√	√	√	√	√		√
Welco Wire & Cable	C-1926	√	√	√	√						

WIRE GAUGES— DIAMETER, AREA AND COPPER WEIGHT

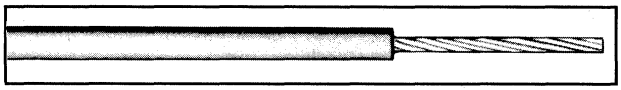
	Diameter at 20°C (68°F)		Area at 20°C (68°F)			Weight at 20°C (68°F), bare copper wire		
Size, AWG	mils	mm	mils	c mils	mm	lb/1,000 ft.	lb/mile	kg/km
4/0	460.0	11.68	166,200	211,600	107.2	640.5	3,382	953.2
3/0	409.6	10.40	131,800	167,800	85.01	507.8	2,681	755.7
2/0	364.8	9.266	104,500	133,100	67.43	402.8	2,127	599.5
1/0	324.9	8.252	82,891	105,600	53.49	319.5	1,687	477.6
1	289.3	7.348	85,730	83,690	42.41	253.3	1,338	337.0
2	257.6	6.543	52,120	66,360	33.62	200.9	1,061	298.9
3	229.4	5.827	41,330	52,620	26.67	159.3	841.1	237.1
4	204.3	5.189	32,780	41,740	21.15	126.3	667.1	188.0
5	181.9	4.620	25,990	33,090	16.77	100.2	528.8	149.0
6	162.0	4.115	20,610	26,240	13.30	79.44	419.4	118.2
7	144.3	3.665	16,350	20,820	10.55	63.03	332.8	93.80
8	128.5	3.264	12,970	16,510	8.367	49.98	263.9	74.38
9	114.4	2.906	10,280	13,090	6.631	39.61	209.2	58.95
10	101.9	2.588	8,155	10,380	5.261	31.43	166.0	46.77
11	90.7	2.304	6,460	8,230	4.17	24.90	131	37.1
12	80	2.05	5,130	6,530	3.310	19.8	104	29.4
13	72.0	1.83	4,070	5,180	2.63	15.7	82.9	23.4
14	64.1	1.63	3,230	4,110	2.08	12.4	65.7	18.5
15	57.1	1.45	2,560	3,260	1.650	9.87	52.1	14.7
16	50.8	1.29	2,030	2,580	1.31	7.81	41.2	11.6
17	45.3	1.150	1,610	2,050	1.040	6.21	32.8	9.24
18	40.3	1.02	1,280	1,620	0.823	4.92	26.0	7.32
19	35.9	0.912	1,010	1,290	0.653	3.90	20.6	5.81
20	32.0	0.813	804.0	1,020	0.519	3.10	16.4	4.61
21	28.5	0.724	638.0	812.0	0.412	2.46	13.0	3.66
22	25.3	0.643	503.0	640.0	0.324	1.94	10.2	2.88
23	22.6	0.574	401.0	511.0	0.259	1.55	8.16	2.30
24	20.1	0.511	317.0	404.0	0.205	1.22	6.46	1.82
25	17.9	0.455	252.0	320.0	0.162	0.970	5.12	1.44
26	15.9	0.404	199.0	253.0	0.128	0.765	4.04	1.14
27	14.2	0.361	158.0	202.0	0.102	0.610	3.22	0.908
28	12.6	0.320	125	159.0	0.0804	0.481	2.54	0.715
29	11.3	0.287	100.0	128.0	0.0647	0.387	2.04	0.575
30	10.0	0.254	78.50	100.0	0.0507	0.303	1.60	0.450
31	8.9	0.226	62.20	79.2	0.0401	0.240	1.27	0.357
32	8.0	0.203	50.30	64.0	0.0324	0.194	1.02	0.288
33	7.1	0.180	39.60	50.40	0.0255	0.153	0.806	0.227
34	6.3	0.160	31.20	39.7	0.0201	0.120	0.634	0.179
35	5.6	0.142	24.60	31.4	0.0159	0.0940	0.501	0.141
36	5.0	0.127	19.60	25.00	0.0127	0.0757	0.400	0.113
37	4.50	0.114	15.90	20.20	0.0103	0.0613	0.324	0.0912
38	4.0	0.102	12.60	16.0	0.00811	0.0484	0.256	0.0721
39	3.5	0.0889	9.62	12.2	0.00621	0.0371	0.196	0.0552
40	3.1	0.0787	7.55	9.61	0.00487	0.0291	0.154	0.0433
41	2.8	0.0711	6.16	7.84	0.00397	0.0237	0.125	0.0353
42	2.5	0.0635	4.91	6.25	0.00317	0.0189	0.0999	0.0282
43	2.2	0.0559	3.80	4.84	0.00245	0.0147	0.0774	0.0218
44	2.0	0.0508	3.14	4.00	0.00203	0.0121	0.0639	0.0180
45	1.8	0.0457	2.54	3.24	0.00164	0.00981	0.0519	0.0146
46	1.6	0.0406	2.01	2.56	0.00130	0.00775	0.0409	0.0115
47	1.4	0.0356	1.54	1.96	0.000993	0.00593	0.0313	0.00883
48	1.2	0.0305	1.13	1.44	0.000730	0.00436	0.0230	0.00649
49	1.1	0.0279	0.950	1.21	0.000613	0.00366	0.0193	0.00545
50	1.0	0.0254	0.785	1.00	0.000507	0.00303	0.0160	0.00450

ABLE RATED™ **Electronic Cable Hook Up Wire, Power Cords, Shrink and Flex Tubing, Cable Ties, Flat Ribbon Cable, Custom Assemblies, and Connectors, Coaxial Hi Temperature and Data Cable.**

MULTI-SPEC WIRE

PVC Insulation – Light Wall

SPECIFICATIONS



- **Conductor:** Solid, stranded or bonded tinned copper
- **Insulation:** Polyvinylchloride (PVC)
- **Insulation Thickness:** .010″
- **Stranding:** Smooth bunch
- **Colors:** White, black, red, green, yellow, light blue, brown, orange, gray, violet, pink, tan and dark blue
- **Stripes:** Any color over colors listed above (Maximum 3 stripes per wire)
- Wire printed with UL and CSA information

ABLE RATED MULTI-SPEC HOOK-UP WIRE meets or exceeds the electrical characteristics of the following:		
UL Style 1061	300V	80°C
CSA Type SRPVC, T2	300V	80°C
MIL-W-76 Type LW	300V	80°C
M 16878/1 Type B	600V	105°C

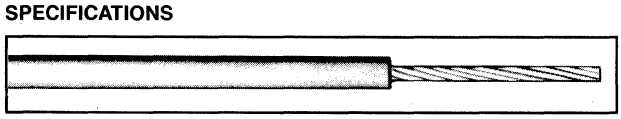
DIMENSIONS

Size AWG	Cond. Strand.	Nom. O.D.	Part No.	Price Per M
32*	7x40	.028″	11132	24.00
30	7x38	.032″	11130	21.60
30	Solid	.031″	11330	24.00
28	7x36	.037″	11128	19.20
28	Solid	.036″	11328	19.00
26	7x34	.038″	11126	19.04
26	Solid	.036″	11326	17.00
24	19x36	.044″	11024	25.76
24	7x32	.044″	11124	20.16
24	7x32†	.044″	11224	26.40
24	Solid	.042″	11324	18.00
22	19x34	.051″	11022	26.88
22	7x30	.051″	11122	22.40
22	7x30†	.051″	11222	26.88
22	Solid	.049″	11322	20.16
20	19x32	.058″	11020	31.36
20	7x28	.058″	11120	24.64
20	7x28†	.058″	11220	31.20
20	Solid	.055″	11320	22.40
18	19x30	.068″	11018	35.84
18	7x26	.068″	11118	31.36
18	7x26†	.068″	11218	43.20
18	Solid	.066″	11318	30.00
16	19x29	.077″	11016	40.32
14*	19x27	.091″	11014	58.24

*Not UL or CSA †Bonded Conductor

PVC Insulation – Medium Wall

SPECIFICATIONS



- **Conductor:** Solid, stranded or bonded tinned copper
- **Insulation:** Polyvinylchloride (PVC)
- **Insulation Thickness:** .016″
- **Stranding:** Smooth bunch
- **Colors:** White, black, red, green, yellow, light blue, brown, orange, gray, violet, pink, tan and dark blue
- **Stripes:** Any color over colors listed above (Maximum 3 stripes per wire)
- Wire printed with UL and CSA identification

ABLE RATED MULTI-SPEC HOOK-UP WIRE meets or exceeds the electrical characteristics of the following:		
UL Style 1007	300V	80°C
UL Style 1569	300V	105°C
CSA Type TR64, T1	300V	90°C
MIL-W-76 Type MW	1000V	80°C
M 16878/2 Type C	1000V	105°C

DIMENSIONS

Size AWG	Cond. Strand.	Nom. O.D.	Part No.	Price Per M
30	7x38	.045″	11430	21.60
28	7x36	.048″	11428	19.20
26	7x34	.052″	11426	19.04
26	Solid	.050″	11626	17.00
24	7x32	.057″	11424	20.16
24	7x32*	.058″	11524	26.40
24	Solid	.055″	11624	18.00
22	7x30	.063″	11422	22.40
22	7x30*	.064″	11522	26.88
22	Solid	.061″	11622	20.16
20	10x30	.069″	11420	29.12
20	10x30*	.070″	11520	31.00
20	Solid	.067″	11620	22.40
18	16x30	.081″	11418	33.60
18	16x30*	.082″	11518	43.20
18	Solid	.078″	11618	30.00
16	26x30†	.093″	11416	40.32
16	Solid	.091″	11616	39.10
14	41x30	.107″	11414	58.24
12	65x30	.128″	11412	102.00
10	105x30	.150″	11410	147.60

*Tinned Overcoat †Bare Overcoat Prices are for solid colors.

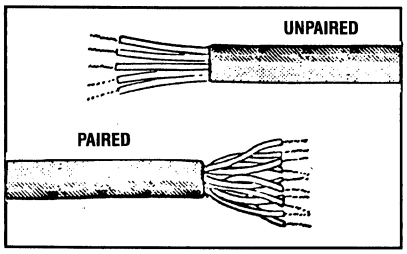
Call, Write or Fax for Our Full Line Discount Catalogue Which includes Specs, Prices and Cross Reference

ABLE ELECTRONIC SUPPLIES 1736 FRONT STREET, YORKTOWN HEIGHTS, NY 10598 • 914-962-2253 • 1-800-431-2103 FAX 914-962-2296

ABLE RATED™

Electronic Cable Hook Up Wire, Power Cords, Shrink and Flex Tubing, Cable Ties, Flat Ribbon Cable, Custom Assemblies, and Connectors, Coaxial Hi Temperature and Data Cable.

22 AWG UNSHIELDED PAIRED AND UNPAIRED CABLE



APPLICATIONS: Multi-purpose unshielded, PVC insulated, paired and unpaired cable for use in various electrical and electronic equipment, control circuits, computers, and other data transmision and signal applications.

UL Conductor Style 1061 VW-1	300V	80°C
UL Cable Style 2464 VW-1	300V	80°C
CSA Conductor Type SR-PVC	300V	80°C
CSA Cable Type AWM	300V	80°C

Conductor: 22 AWG, 7×30 stranding, tinned copper
Insulation: .010" Color coded PVC except **.015
Construction: Conductors Cabled or paired with fillers as required
Jacket: Gray PVC

ABLE Part No.	No. of Cond.	Jkt. Thk.	Nom. O.D.	Color Code Chart	Wt. per M	PRICES PER C FEET 100	250
UNPAIRED CABLE							
14020	2	.032	.164	1	12	9.08	7.90
140311	3	.031	.170	•	13	12.30	10.72
140312	3	.032	.169	1	15	12.30	10.72
14041	4	.032	.194	1	19	15.06	13.10
14051	5	.032	.199	1	22	17.77	15.45
14061	6	.032	.209	1	25	21.74	18.90
14071	7	.032	.214	1	28	25.25	21.09
14081	8	.032	.224	1	34	29.38	25.55
14091	9	.032	.245	1	37	31.00	29.18
14101	10	.032	.259	1	41	35.65	31.00
14121	12	.032	.270	1	48	47.10	40.95
141511	15	.032	.304	1	61	66.75	58.05
141512	15	.040	.330	2	71	66.75	58.05
14181	18	.032	.320	2	79	79.97	69.54
142011	20	.032	.324	1	81	64.36	55.96
142012	20	.040	.350	2	83	64.36	55.96
142511	25	.032	.354	1	98	111.19	96.69
142512	25	.040	.370	2	105	111.19	96.69
143011	30	.032	.379	1	121	135.31	117.66
143012	30	.040	.400	2	140	135.30	117.66
14351	35	.032	.409	1	148	148.12	128.80
14371	37	.036	.425	1	150	154.56	134.40
144911	40	.032	.439	1	151	183.21	159.24
144012	40	.049	.455	2	180	183.21	159.24
145011	50	.035	.500	1	190	227.33	197.68
145012	50	.049	.500	2	225	227.33	197.68
146011	60	.035	.539	1	230	269.69	234.51
146012	60	.035	.535	2	235	269.69	234.51

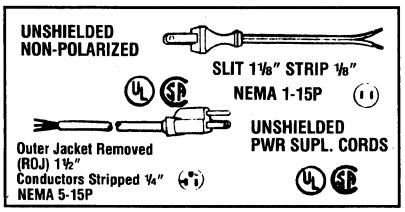
*Black, red, and green

PAIRED CABLE

14013	1**	.032	.188	3	14		
14023	2**	.032	.250	3	28	11.17	12.84
14033	3**	.032	.280	3	40	15.70	18.06
14043	4**	.032	.298	3	48	26.16	30.09
14063	6	.032	.320	3	60	39.05	44.90
14093	9	.032	.375	3	90	61.18	70.35
14123	12	.032	.405	3	115	91.99	80.00
14153	15	.037	.440	3	140	112.05	97.44
14193	19	.037	.480	3	160	141.24	122.82
14233	23	.042	.540	3	200	177.65	154.50
14273	27	.042	.570	3	220	218.54	190.00
14314	31	.050	.635	3	270	251.50	218.69
14413	41	.060	.730	3	357	329.26	286.31
14513	51	.060	.780	3	425	413.78	359.81

COLOR CODE CHART UPON REQUEST

POWER SUPPLY CORDS



Part No. Color Code	AWG & Type	Feet Meters	Length Std. Carton	Each	Unit Prices 25	300	1000
UNSHIELDED NON-POLARIZED POWER SUPPLY CORDS—2 CONDUCTOR							
2050-006-BL	18/2 SPT-1	6/1.8	250	1.34	1.11	.93	.81
2050-008-BL*	18/2 SPT-1	8/2.4	100	1.41	1.15	.95	.84
2050-010-BL*	18/2 SPT-1	10/3.1	100	1.50	1.18	.98	.87
2343-007-BL	18/2 SPT-2	7/2.1	200	1.43	1.16	.97	.86
UNSHIELDED POWER SUPPLY CORDS—3 CONDUCTOR							
2103-076-GX	18/3 SVT	6/1.8	125	2.60	2.16	1.80	1.57
2112-006-GY**	18/3 SVT	6/1.8	100	2.60	2.16	1.80	1.57
2112-008-GY**	18/3 SVT	8/2.4	100	2.93	2.44	2.04	1.77
2112-008-BX	18/3 SVT	8/2.4	100	2.93	2.44	2.04	1.77
2112-010-GY**	18/3 SVT						
1318-006-GY	18/3 SJT	6/1.8	100	2.75	2.29	2.91	1.66
1618-006-GX	18/3 SJT	6/1.8	100	2.84	2.37	1.97	1.72
1318-006-BL	18/3 SJT	6/1.8	100	2.25	2.29	1.91	1.66
1618-006-BX	18/3 SJT	6/1.8	100	2.84	2.37	1.97	1.72
1318-008-GY	18/3 SJT	8/2.4	75	3.20	2.66	2.32	1.99
1618-008-GX	18/3 SJT	8/2.4	75	3.29	2.74	2.28	1.99
1318-008-BL	18/3 SJT	8/2.4	75	3.20	2.66	2.22	1.93
1618-008-BX	18/3 SJT	8/2.4	75	3.29	2.74	2.28	1.99
1318-010-BL	18/3 SJT	10/3.1	75	3.73	3.11	2.59	2.25
1618-010-BX	18/3 SJT	10/3.1	75	4.39	3.66	3.05	2.65

**Jacket Ribbed (Not a PEC Product)

UNSHIELDED POWER SUPPLY CORDS—3 CONDUCTOR

1316-006-BL	16/3 SJT	6/1.8	75	3.38	2.81	2.34	2.04
1616-006-BX	16/3 SJT	6/1.8	75	3.55	2.95	2.46	2.14
1316-008-BL	16/3 SJT	8/2.4	50	3.79	3.15	2.62	2.28
1616-008-BX	16/3 SJT	8/2.4	50	3.94	3.29	2.74	2.38
1316-010-BL	16/3 SJT	10/3.1	75	4.23	3.53	2.96	2.56
1616-010-BX	16/3 SJT	10/3.1	75	4.39	3.66	3.05	2.65
1314-006-BL	14/3 SJT	6/1.8	50	5.98	4.93	4.11	3.58
1614-006-BX*	14/3 SJT	6.7/2.0	50	5.98	4.93	4.11	3.58
1314-008-BL	14/3 SJT	8/2.4	50	6.61	5.51	4.59	3.99
1614-008-BX*	14/3 SJT	8/2.4	50	6.61	5.51	4.59	3.99
1318-01M-GX*T	18/3 SJTO	3.3/1.0	100	2.65	2.03	1.81	1.63
1318-02M-GX*T	18/3 SJTO	6.4/2.0	100	3.28	2.48	2.23	2.00
1318-25M-GX*T	18/3 SJTO	8.3/2.5	100	3.85	2.92	2.64	2.38
1318-03M-GX*T	18/3 SJTO	10.3/3.1	75	4.49	3.38	3.12	2.81

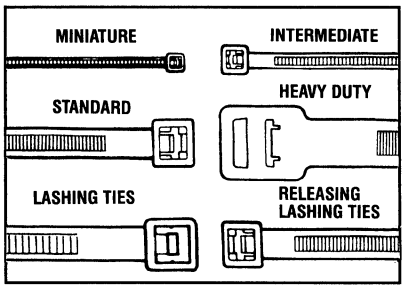
* Not a PEC Product T Timed

UNSHIELDED CABLE SPECIFICATIONS

AWG/ No. Cond.	Wire Type	Stranding	Nom. O.D. (Inches)	Power Ratings Watts	Amps	Volts
18/2	SPT-1	41×34	.106/.203	1250	10	125
18/2	SPT-2	41×34	.136/.265	1250	10	125
18/3	SVT	41×34	.253	1250	10	125
18/3	SJT	16×30	.328	1250	10	125
16/3	SJT	26×30	.333	1625	13	125
14/3	SJT	41×30	.375	1875	15	125

NORTH AMERICAN		INTERNATIONAL
Black	Live	Brown
White	Neutral	Blue
Green	Ground	Grn/Yel
Color Code	**Jacket**	**Conductors**
GY	Gray	NA
GX	Gray	CEE
BL	Black	NA
BX	Black	CEE

TYABLE CABLE TIES

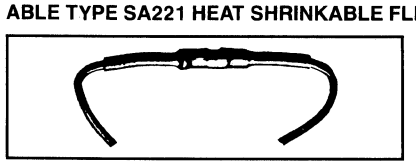


ABLE Part No.	Min. Ten. Str.	Max Bdl. Dia.	Approx. Length (in.)	MIL SPEC 3367	Prices per C (hundred pack) 100	500
MINIATURE						
C-T25	18	3/4	3.75	N/A	2.00	1.60
C-T35	18	15/16	4.00	4	2.42	1.94
C-T36	18	1-1/2	5.88	NOTE 1	3.39	2.72
C-T37	18	2	7.63	NOTE 1	4.10	3.28
INTERMEDIATE						
C-T4	30	1	5.00	N/A	3.41	2.73
C-T5	40	1-1/4	6.00	5	3.90	3.12
C-T40	40	2-1/8	8.50	NOTE 2	4.40	3.52
C-T51	40	3	11.50	NOTE 2	9.80	7.85
STANDARD						
C-T6	50	1-3/4	7.00	1	4.84	3.88
C-T110	50	3	11.00	7	11.55	9.24
C-T140	50	4	14.00	2	12.54	10.03
HEAVY DUTY						
C-TH80	120	2	7.88	N/A	15.60	14.10
C-TH140	120	4	14.72	3	22.00	19.94
C-TH170	120	5	17.58	NOTE 3	35.20	32.00
C-TH210	120	6	21.47	NOTE 3	43.00	39.00
C-TH280	120	8	28.91	6	49.60	45.00
C-TH320	120	9	32.00	NOTE 4	61.60	56.00
EXTRA HEAVY DUTY						
C-THX240	175	7	24.00	N/A	59.00	40.00
C-THX340	175	10	34.00	N/A	74.00	52.00
C-THX480	175	15	48.00	N/A	120.00	90.00
LASHING TIES						
C-THL509	250	2	9.00	N/A	40.00	33.40
C-THL520	250	5	20.00	N/A	20.00	58.80
C-THL522	250	6	22.00	N/A	90.00	65.20
C-THL529	250	8	29.00	N/A	120.00	89.20
C-THL535	250	10	35.00	N/A	130.00	104.00
C-THL541	250	12	41.00	N/A	150.00	115.40
RELEASING LASHING TIES						
C-THR509	250	2	9.00	N/A	48.00	40.08
C-THR520	250	5	20.00	N/A	84.00	70.56
C-THR522	250	6	22.00	N/A	108.00	78.24
C-THR529	250	8	29.00	N/A	144.00	107.04
C-THR535	250	10	35.00	N/A	156.00	124.80
C-THR541	250	12	41.00	N/A	180.00	138.48

STANDARD COLORS: Natural, Black available at additional 15%
OTHER COLORS: Please call for quote

NOTE 1: Meets MS3367/4 except accommodates a larger bundle diameter
NOTE 2: Meets MS3367/5 except accommodates a larger bundle diameter
NOTE 3: Meets MS3367/3 except accommodates a larger bundle diameter
NOTE 4: Meets MS3367/6 except accommodates a larger bundle diameter

ABLE TYPE SA221 HEAT SHRINKABLE FLEXIBLE POLYOLEFIN



DESCRIPTION: ABLE TYPE SA221 is flexible, cross-linked polyolefin heat shrinkable tubing available on spools or in cut lengths that will recover to half its original length when heated to temperatures of 250°F (121 C). During the shrinking operation the tubing will encapsulate any device inside of it and assume the contour of that device. Continuous operating range −55°C to +135°C. SA221 conforms to MIL-I-23053/5 Type 1 (all colors and Type 2 clear). Type 1 recognized by UL and CSA and meet SAE Aerospace Material Specification AMS 3636. Type 2 meets SAE AMS 3637.

2:1 shrink at 250°F (121°C)
600V 125°C VW-1
UL recognized
CSA certified

MIL-I-23053/5
Type 1 and 2
Class I and II
AMS 3636 and 3637

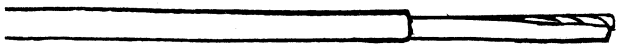
***PART NUMBER PREFIX:**
Change SA to SL: 4-foot lengths
Change SA to PL: 4-foot UL & CSA
Change SA to SR: spools
Change SA to PR: spools UL & CSA

STANDARD COLORS: Black, clear
AVAILABLE COLORS: White, red, blue, yellow
TYPE 1: (flame retarded) all colors, UL and CSA
TYPE 2: (flammable) clear only, not UL or CSA
MARKING: Printed with recognized UL and CSA markings

*ABLE Part No.—Size	Min. Exp. I.D.	Min. Rec. I.D.	Nom. Rec. Wall	Prices Per C Feet Under 100	100	500
SA221-3/64	.046	.023	.016	22.80	15.20	13.68
SA221-1/16	.063	.031	.017	24.30	16.20	14.58
SA221-3/32	.093	.046	.020	27.60	18.40	15.56
SA221-1/8	.125	.062	.020	29.10	19.40	17.46
SA221-3/16	.187	.093	.020	35.40	23.60	21.24
SA221-1/4	.250	.125	.025	44.85	29.90	26.91
SA221-3/8	.375	.187	.025	49.95	33.30	29.97
SA221-1/2	.500	.250	.025	56.40	37.60	33.84
SA221-3/4	.750	.375	.030	75.45	50.30	45.27
SA221-1	1.00	.500	.035	105.75	70.50	63.45
SA221-1-1/2	1.50	.750	.040	195.00	130.00	117.00
SA221-2	2.00	1.00	.045	267.75	178.50	160.65
SA221-3	3.00	1.50	.050	540.00	360.00	324.00
SA221-4	4.00	2.00	.055	700.00	465.00	418.00

ABLE RATED™ — **Electronic Cable, Hook Up Wire, Power Cords, Shrink and Flex Tubing, Cable Ties, Flat Ribbon Cable, Custom Assemblies, and Connectors, Coaxial, High Temperature and Data Cable.**

EX-FLEX MICRO MINIATURE INSULATED LEAD WIRE



APPLICATIONS

An instrument lead where ultra-flexability is required in a micro-miniature size, for use in guidance control systems, gyroscopes, data processing equipment, biomedical instruments, or wherever continuous flexing is encountered.

FEATURES

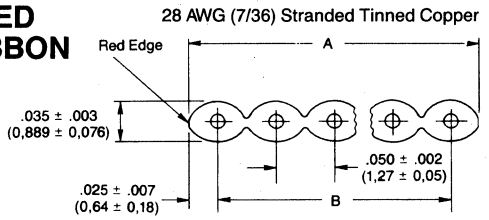
Conductor: Soft bare annealed copper
Insulation: Special soft PVC compound formulated for superior flexibility, dielectric durability, and reliability
Temp Rating: 90° C
UL: On request

ABLE Part No.	AWG	Strand	Nom. Thk.	Max. Volt.	PRICES PER C FEET 100	1000
16136	36	7x44	.005	200V	22.00	11.00
16134	34	10x44	.010	600V	18.00	9.00
16132	32	18x44	.010	600V	8.00	4.00
16130	30	28x44	.010	600V	12.00	6.00
16129	29	51x46	.010	600V	14.00	7.00
16128	28	41x44	.010	600V	16.00	8.00
16127	27	48x44	.010	600V	18.00	9.00
16126	26	66x44	.010	600V	12.00	6.00
16124	24	105x44	.015	600V	18.00	9.00
16122	22	168x44	.015	600V	26.00	13.00
16120	20	259x44	.015	600V	36.00	18.00
16118	18	413x44	.015	600V	44.00	22.00

COLORS: White, black, red, green, yellow, blue, brown, orange, gray, and violet.

EXTRUDED FLAT RIBBON CABLE

28 AWG (7/36) Stranded Tinned Copper



Dimensions and characteristics subject to change without notice.

FEATURES

- Fast, mass termination to all standard 50 mil (IDC) connectors
- Up to 64 conductors, precisely spaced for controlled electrical characteristics
- Highly flexible
- Double contour allows termination from either side of cable, easy conductor separation for circuit routing
- UL listed Style 2651

ELECTRICAL CHARACTERISTICS

Voltage rating: 300V
Temperature rating: 105°C
Impedance: 105 Ohms nominal
Capacitance: 15 pf/ft (49.2 pf/m) nom.
Insulation resistance: 10^{10} Ohms/10 ft (3m) min.
UL style number: Cable Style 2651

PACKAGING-100′ lengths—also available in 300′ lengths

DIMENSIONAL DATA

ABLE Part No.	No. of Cond.	Width A inches	Width A mm	Span B inches	Span B mm
17709	9	.450 ± .010	(11,43)	.400 ± .007	(10,16 ± 0,18)
17710	10	.500 ± .010	(12,70)	.450 ± .007	(11,43 ± 0,18)
17714	14	.700 ± .010	(17,78)	.650 ± .007	(16,51 ± 0,18
17715	15	.750 ± .010	(19,05)	.700 ± .007	(17,78 ± 0,18)
17716	16	.800 ± .010	(20,32)	.750 ± .009	(19,05 ± 0,23)
17720	20	1.000 ± .015	(25,40)	.950 ± .009	(24,13 ± 0,23)
17724	24	1.200 ± .015	(30,48)	1.150 ± .009	(29,21 ± 0,23)
17725	25	1.250 ± .015	(31,75)	1.200 ± .009	(30,48 ± 0,23)
17726	26	1.300 ± .015	(33,02)	1.250 ± .009	(31,75 ± 0,23)
17734	34	1.700 ± .015	(43,18)	1.650 ± .009	(41,91 ± 0,23)
17737	37	1.850 ± .015	(47,00)	1.800 ± .009	(45,72 ± 0,23)
17740	40	2.000 ± .015	(50,80)	1.950 ± .011	(49,53 ± 0,28)
17750	50	2.500 ± .015	(63,50)	2.450 ± .011	(62,23 ± 0,28)
17760	60	3.000 ± .015	(76,20)	2.950 ± .011	(74,93 ± 0,28)
17764	64	3.200 ± .015	(81,28)	3.150 ± .011	(80,01 ± 0,28)

MULTI-PURPOSE SINGLE CONDUCTOR SHIELDED WIRE

For use in control systems, power supplies, and other interconnecting circuits.

ABLE RATED MULTI-SPEC HOOK-UP WIRE

Meets or exceeds the electrical characteristics of the following:

UL Conductor Style 1569 VW-1	300V	105°C
UL Cable Style 1108*	300V	90°C
CSA Type TR64	300V	90°C
MIL-W-76 Type MW	1000V	80°C
MIL-W-16878/2 Type C	1000V	105°C

FEATURES

Conductor: Stranded tinned copper
Insulation: .016″ thick, black PVC**
Shield: 85% coverage 36 AWG tinned copper braid
Jacket: .016″ thick PVC

ABLE Part No.	AWG	Strand	Nom. O.D.	PRICES PER C FEET 100	PER M FEET 1000
11412SJ	12*	65x30	.185	46.53	258.50
11414SJ	14*	41x30	.164	46.00	230.00
11416SJ	16	26x30	.150	34.00	170.00
11418SJ	18	16x30	.138	28.00	140.00
11420SJ	20	10x30	.126	24.00	120.00
11422SJ	22	7x30	.120	22.00	110.00
11424SJ	24	7x32	.115	20.00	100.00

* Not approved for UL style 1108 ** Other colors available

Standard Insulation Color: Black** White
Standard Jacket Colors: White, black, red, green, yellow, blue, brown, orange, gray, violet.

SHIELDING AND BONDING FLAT COPPER BRAID

APPLICATIONS

Very flexible multi-strand tinned copper braid for use as ground strap or for shielding applications. Braid is supplied flat or available in a tubular configuration.

TINNED COPPER FLAT BRAID

ABLE Part No.	Approx AWG Equiv.	Width and Thickness	Approx CAM x 1000	AWG & No. of Wire	Approx AMP* Rating	Lbs. per M	PRICE PER C 100	500
95000	3/0	2.00x.12	154.40	30/1463	310	500	550.00	450.00
95005	2/0	1.75x.08	125.40	30/1248	280	420	462.00	378.00
95010	3	1.50x.06	53.064	30/528	150	180	198.00	162.00
95015	5	1.38x.05	33.700	30/336	100	118	130.00	106.00
95020	7	1.00x.04	20.800	36/816	85	75	94.00	77.00
95025	7	0.75x.04	20.800	36/816	85	75	94.00	77.00
95030	10	0.63x.03	9.600	36/384	53	39	44.00	36.00
95035	10	0.50x.03	9.600	36/384	53	39	44.00	36.00
95040	12	0.38x.03	7.200	36/288	46	28	33.00	27.00
95045	14	0.25x.03	4.200	36/168	32	18	22.00	18.00
95050	15	0.18x.02	3.000	36/120	25	13	17.00	14.00
95055	18	0.12x.02	1.800	36/72	16	9	14.00	11.00
95060	19	0.09x.02	1.200	36/48	11	7	12.00	9.00
95065	22	0.05x.02	.600	36/24	7	5	10.00	7.50
95070	24	0.03x.02	.450	36/16	6	4	9.00	6.50

* To be used as a guide only (bare copper in free air at 30°C

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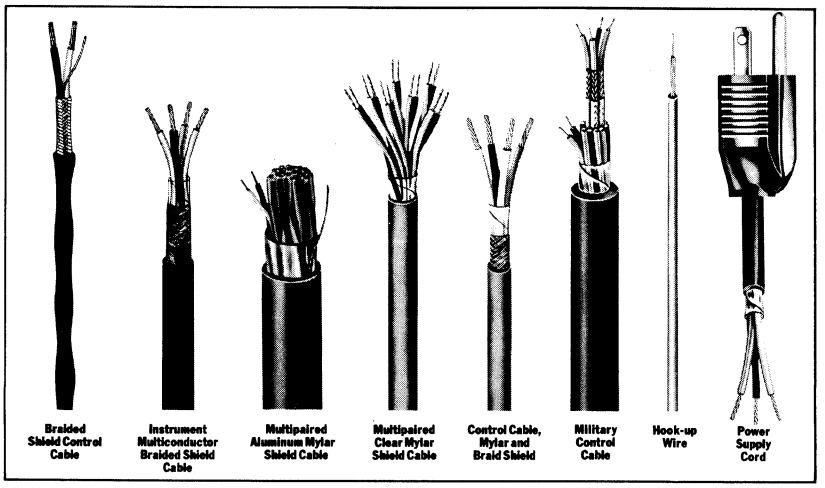

Product Description	Maximum Voltage Rating	Maximum Operating Temp. °C	Size Range AWG	Conductor Material	Insulation Materials	Jacket Materials	Shielding*
Audio & Sound Cable	90-600	60-105	14-22	BC, TC	PE, PVC	PVC	Optional
Coaxial Cable	–	60-80	11-30	BC, TC, SC, CW	PE, FPE, SSP	PVC, NVC	Yes
Control Cable	300-1000	60-90	10-18	BC, TC	PVC, PE, RUB XLP, EPR	PVC, NEO HYP	Optional
Communication Cable	200-600	60-105	12-26	TC	PE, PVC, PP	PVC	Optional
Computer & P.O.S. Cable	200-300	80-105	22-26	TC	PP, PVC, PE	PVC	Yes
Fire Alarm Cable	300	105	12-22	BC, TC	PVC	PVC	Optional
Hook-up Wire (UL, CSA, MIL)	300-2500	80-200	2-26	BC, TC	PE, PVC, XLP Silicone	Nylon Laq. Glass Braid	–
Instrumentation Cable	300-600	60-105	12-26	BC, TC	PE, PP, PVC RUB, XLP, EPR	PVC, NEO HYP	Optional
Military Cable	300	60-150	1000 MCM 24	BC, TC	PE, PP, PVC, RUB, XLP, EPR	PVC, NEO, HYP	Optional
Portable & Flexible Cord	300-600	60-105	10-18	BC, TC	PVC, RUB, NEO HYP, EPR, XLP	PVC, RUB NEO, HYP	Optional

LEGEND:
BC = Bare Copper
CW = Bare Copper Covered Steel
EPR = Ethylene Propylene Rubber
FEP = Florinated Ethylene Propylene
FPE = Cellular (foam) polyethylene
PVC = Polyvinyl Chloride
SC = Silver Coated Copper
SSP = Semi-solid polyethylene
TC = Tinned Copper
XLP = Cross-lined Polyethylene

*AVAILABLE SHIELDS:
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- Bare or Tinned Copper Tape
- Bare or Tinned Copper Braid
- Spiral Wrapped Tinned Copper

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MINIGLOSSARY CONNECTORS

Connector terminology is often quite confusing. This confusion starts with the very names of connectors. The name of a connector may derive from its shape, application, type of conductor or even method of termination.

Shape—Circular, cylindrical, and rectangular.

Electrical application—High voltage, RF, microwave, input/output, etc.

Mechanical application—Printed circuit, rack & panel, cable, etc.

Conductor type—Coaxial, flat cable, ribbon cable, flex circuit, etc.

Termination method—Wirewrap, soldercup, solderless, etc.

Hardware such as clamps, hoods, and adapters are frequently used to convert cable connectors to rack and panel types. This adds to the name confusion. A very common telephone connector, for example (the "C" type) got its name from the model number of the original maker.

Contact: The part(s) of the connector that actually provides circuit continuity between its two sections—the parts which are normally mated. The back end of the connector should properly be called the *termination.* This is the point where the wires or PC board is attached to the connector.

Contact alignments: Often called *contact float.* Describes the amount of allowable contact movement within the connector body. Permits self-alignment.

Male vs. female: In the U.S. this describes the contact construction. In Europe this term is more often used to describe the outer shell mating action which may be the reverse of the contacts.

Closed entry: A female contact which prevents entry of a male contact larger than a specific size.

Open entry: A female contact designed for a specific size of male contact but which will allow entry of larger male contacts by spring action.

Hermaphrodite: Contacts or connector bodies which are the same configuration. Male/female designations do not apply. Bodies usually have some mechanical means for maintaining polarity.

Hermetic seal: Glass-to-metal seals at terminations. Often used improperly to describe vacuum-tight seals.

Waterproof seal: May or may not be truly *waterproof.* May prevent easy entrance of casual water by means of a rubber or other boot.

Printed circuit connector: Connectors which are used in conjunction with printed circuit boards. There are two distinctly different styles.

Edgeboard. May be called *edge* or *card.* The printed circuit (PC) board edge enters the connector.

Two-piece: One part of the connecting pair is physically attached to the PC board itself. The other part is attached to something else such as a cable or a motherboard.

Readout: Describes the arrangement at the terminating edge of a PC board. May be single or double. A double readout PC board has termination strips on each side not usually interconnected.

Ribbon connectors: A type of connector which allows flat "ribbon" cable to be attached to a round or rectangular connector but also used interchangeably for flat connectors to flat cable.

Ribbon contact connector: Describes the contacts in a rectangular connector which have a self-wiping mating action. Not the same as ribbon connector.

Solderless terminal: Any style of termination which does not require solder for a permanent connection. See *crimp* and *insulation displacement.*

Crimp termination: A stripped wire is inserted into a barrel or trough which is then crimped to the conductor with a suitable tool.

Insulation displacement: Unstripped insulated wire is fitted into a channel containing metal teeth which are forced through the insulation to make contact with the conductor.

Service rating: The maximum rated voltage and/or current which may be applied continuously. May be called *working voltage.* Can be confused with the term used to describe how many times a connector may be mated and separated.

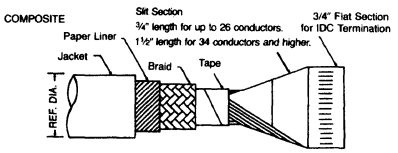
Withstanding voltage: Also called *test voltage.* The voltage a connector must withstand for one minute without breakdown. Applied between connectors and between connectors and shell and any grounding devices of the connector.

Amphenol SPECTRA-STRIP

CABLE & CONNECTORS

AMPHENOL® SPECTRA STRIP

ROUND 'N' FLAT 159-2801 SERIES



DESCRIPTION:

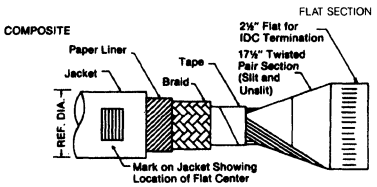
Round 'N' Flat cable combines the handling and shielding features of round cable, and the mass termination capabilities of flat cable.

CHARACTERISTICS:

Conductors: 28-7AWG
Insulation: PVC
Pitch: .050" ± .003".
Impedance: 75 OHMS
Capacitance: 24 pf/ft

No. Cond.	Width "A"		Span "B"		Ref. Dia. Inches
	Inches	(mm)	Inches	(mm)	
9	.450	(11,43)	.400 ± .007	(10,16 ± 0,18)	.270
10	.500	(12,70)	.450 ± .007	(11,43 ± 0,18)	.270
15	.750	(19,05)	.700 ± .011	(17,78 ± 0,28)	.300
16	.800	(20,32)	.750 ± .011	(19,05 ± 0,28)	.310
20	1.000	(25,40)	.950 ± .011	(24,13 ± 0,28)	.330
24	1.200	(30,48)	1.150 ± .011	(29,21 ± 0,28)	.350
25	1.250'	(31,75)	1.200 ± .011	(30,48 ± 0,28)	.360
26	1.300	(33,02)	1.250 ± .011	(31,75 ± 0,28)	.360
34	1.700	(43,18)	1.650 ± .011	(41,91 ± 0,28)	.400
36	1.800	(45,72)	1.750 ± .015	(44,45 ± 0,38)	.410
37	1.850	(47,00)	1.800 ± .015	(45,72 ± 0,38)	.410
40	2.000	(50,80)	1.950 ± .015	(49,53 ± 0,38)	.430
50	2.500	(63,50)	2.450 ± .015	(62,23 ± 0,38)	.480
60	3.000	(76,20)	2.950 ± .015	(74,93 ± 0,38)	.520
64	3.200	(81,28)	3.150 ± .015	(80,01 ± 0,38)	.530

ROUND TWIST 'N' FLAT 159-2832 SERIES



DESCRIPTION:

Round Twist 'N' Flat cable combines handling and shielding features of round twisted pair cable, and the mass termination capabilities of flat cable.

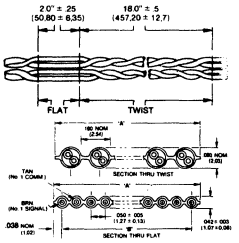
The inner cable is composed of twisted pairs with alternating 2½" flat sections on controlled spacing of .050" ± .005" for IDC termination.

CHARACTERISTICS:

Conductors: 28-7AWG
Insulation: PVC
Pitch: .050" ± .005" in flat sections
Impedance: 100 OHMS nom.
Capacitance: 22 pf/ft

No. Pairs	Width "A"		Span "B"		Ref. Dia. Inches
	Inches	(mm)	Inches	(mm)	
5	.526	(13,36)	.450 ± .015	(11,43 ± 0,38)	.300
7	.726	(18,44)	.650 ± .015	(16,51 ± 0,38)	.330
8	.826	(20,98)	.750 ± .015	(19,05 ± 0,38)	.340
10	1.026	(26,06)	.950 ± .015	(24,13 ± 0,38)	.380
13	1.326	(33,68)	1.250 ± .015	(31,75 ± 0,38)	.410
17	1.726	(43,84)	1.650 ± .015	(41,91 ± 0,38)	.450
20	2.026	(51,46)	1.950 ± .020	(49,53 ± 0,51)	.480
25	2.526	(64,16)	2.450 ± .020	(62,23 ± 0,51)	.530
30	3.026	(76,86)	2.950 ± .020	(74,93 ± 0,51)	.570
32	3.226	(81,94)	3.150 ± .025	(80,01 ± 0,64)	.580

TWIST 'N' FLAT 132 SERIES



DESCRIPTION:

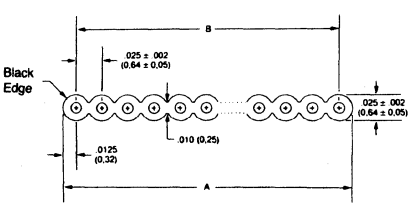
Twin 'N' Flat cable combines the electrical performance of twisted pair cable, with the mass termination capabilities of flat cable. Conductors are twisted into pairs and laminated between layers of PVC film. 2" flat (untwisted) sections on .050" pitch occur for IDC termination.

CHARACTERISTICS:

Conductors: 28-7AWG
Insulation: Color Coded PVC
Pitch: .050" ± .005" in flat areas.
Impedance: 100 OHMS
Capacitance: 22 pf/ft

No. Pairs	Width "A"		Span "B"	
	Inch	(mm)	Inch	(mm)
5	.526	(13,46)	.450 ± .015	(11,43 ± 0,38)
7	.726	(18,54)	.650 ± .015	(16,51 ± 0,38)
8	.826	(21,08)	.750 ± .015	(19,05 ± 0,38)
10	1.026	(26,16)	.950 ± .015	(24,13 ± 0,38)
13	1.326	(33,78)	1.250 ± .015	(31,75 ± 0,38)
17	1.726	(43,94)	1.650 ± .015	(41,91 ± 0,38)
18	1.826	(46,48)	1.750 ± .015	(44,45 ± 0,38)
20	2.026	(51,56)	1.950 ± .020	(49,53 ± 0,51)
25	2.526	(64,26)	2.450 ± .020	(62,23 ± 0,51)
30	3.026	(76,96)	2.950 ± .020	(74,93 ± 0,51)
32	3.226	(82,04)	3.150 ± .025	(80,01 ± 0,64)

.025" CENTER ZIP CABLE 191-3003 SERIES



DESCRIPTION:

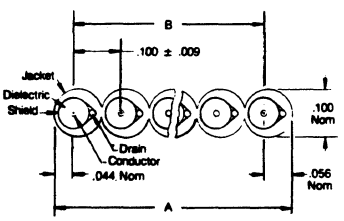
.025" pitch zip cable meets industry requirements for miniaturized insulation displacement interconnect systems.

CHARACTERISTICS:

Conductors: 30-1AWG
Insulation: PVC
Pitch: 025" ± .002".
Impedance: 80 OHMS
Capacitance: 20 pf/ft at 1 MHZ

No. Cond.	Width "A"		Span "B"	
	In.	(mm)	In.	(mm)
26	.650	(16,51)	.625 ± .005	(15,88 ± 0,13)
34	.850	(21,59)	.825 ± .005	(20,96 ± 0,13)
40	1.000	(25,40)	.975 ± .006	(24,77 ± 0,15)
50	1.250	(31,75)	1.225 ± .006	(31,12 ± 0,15)
60	1.500	(38,10)	1.475 ± .006	(37,47 ± 0,15)
64	1.600	(40,64)	1.575 ± .006	(40,01 ± 0,15)
80	2.000	(50,80)	1.975 ± .006	(50,17 ± 0,15)
100	2.500	(63,50)	2.475 ± .007	(62,87 ± 0,16)

SPECTRA-COAX PLANAR CABLE 121 SERIES



DESCRIPTION:

Spectra Coax combines the ultra high speed signal carrying capabilities of coax, and the mass termination capabilities of flat cable. Each conductor consists of foamed or solid polypropylene insulation, aluminum polyester shield, and a drain wire.

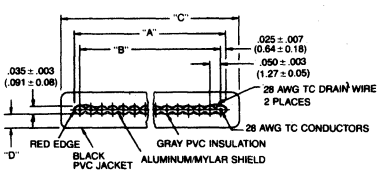
CHARACTERISTICS:

50 OHM Coax—Center Conductor: 28AWG
Dielectric: Solid polypropylene
Conductor Spacing: .100" ± .009"
Jacket: Black PVC
Impedance: 50 ± 3 OHMS
Capacitance: 31 ± 1 pf/ft

75 OHM Coax—Center Conductor: 30AWG
Dielectric: Foamed polypropylene
Jacket: Gray PVC
Impedance: 75 ± 4 OHMS
Capacitance: 17.1 ± 1 pf/ft

93 OHM Coax—Center Conductor: 30AWG
Dielectric: Foamed polypropylene
Jacket: Red PVC
Impedance: 93 ± 5 OHMS
Capacitance: 14 ± 2 pf/ft

JACKETED ZIP CABLE 151-2831 SERIES



DESCRIPTION:

Jacketed Zip Cable consists of 28-7 AWG extruded PVC conductors on .050" pitch, with an aluminum polyester shield, 2 drain wires, and a .030" thick over-all PVC jacket.

CHARACTERISTICS:

Impedance: 50 OHMS
Capacitance: 40 pf/ft

No. of Conductors	Dimension "A"	Dimension "B"	Dimension "C"
9	.450(11,43)	.400 ± .007(10,16 ± 0,18)	.510
10	.500(12,70)	.450 ± .007(11,43 ± 0,18)	.560
14	.700(17,78)	.650 ± .007(16,51 ± 0,18)	.760
15	.750(19,09)	.700 ± .011(17,78 ± 0,28)	.810
16	.800(20,32)	.750 ± .011(20,32 ± 0,28)	.860
20	1.000(25,40)	.950 ± .011(24,13 ± 0,18)	1.060
24	1.200(30,48)	1.150 ± .011(29,21 ± 0,28)	1.260
25	1.250(31,79)	1.200 ± .011(30,48 ± 0,28)	1.310
26	1.300(33,02)	1.250 ± .011(31,75 ± 0,28)	1.360
34	1.700(43,18)	1.650 ± .011(41,90 ± 0,28)	1.760
36	1.800(45,72)	1.750 ± .015(44,45 ± 0,38)	1.860
37	1.850(46,99)	1.800 ± .015(45,72 ± 0,38)	1.910
40	2.000(50,80)	1.950 ± .015(49,53 ± 0,38)	2.060
50	2.500(63,50)	2.450 ± .015(62,23 ± 0,38)	2.560
60	2.000(76,20)	2.950 ± .015(74,93 ± 0,38)	3.060
64	3.200(81,28)	3.150 ± .015(80,01 ± 0,38)	3.260

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INSTRUMENTATION & COMMUNICATIONS CABLE

SHIELDED CABLES

Construction
- Stranded or solid tinned copper conductors
- Color coded polyethylene, polypropylene, polyvinylchloride, or rubber insulation
- Conductors cabled
- Shield Types:
  (A) Braided Tin Copper
  (B) Spiral Tin Copper
  (C) Mylar*/aluminum Foil Shield Wrap and Tin Copper Drain
- Outer Jacket Types:
  (A) PVC
  (B) Black Neoprene
  (C) Black Rubber

Characteristics
- Temperature Range:
  −20°C to +80°C (UL +75°C)
- (UL) CL2

Voltage Rating:

UL 1107	400V	UL 2543	300V
UL 1150	600V	UL 2548	300V
UL 2093	450V	UL 2552	300V
UL 2106	600V	UL 2629	300V
UL 2324	300V	UL 2725	300V

Applications
- Audio • Data Transmission
- Broadcast • Sound

COMPUTER CABLES

Construction: (Low-cap/Miniature)
- Stranded tinned copper conductors
- Color coded "Low-Cap" poly insulation
- Conductors cabled
- Overall Mylar/Aluminum foil shield and 24 stranded tin copper drain wire plus 65% coverage tin copper braid shield overall.
- Gray PVC outer jacket

Characteristics: (Low-cap)
- Temperature range: −20°C + 80°C (UL 80°C) UL 2919 30 Volts

Applications: (Low-cap)
- Computer/Data • CAD/CAM
- EIA RS-232 EIA RS-423

Characteristics (Miniature)
- −20°C to +80°C (UL + 80°C)
- UL 2919 30 Volts
- Low distortion data handling
- Loe dielectric constant
- Lightweight • (UL) CL2
- Meets RS-422 requirements

Applications (Miniature)
- Computer • Data
- FCC Docket 20780 Class A and B

pvc jacketed spiral serve shielded two conductor cable (UL) CL2

Gauge and Strand	Insul. Type	Insul. Wall	Jacket Wall	O.A. Dia.	Volts	Cap. pF/Ft.	Shield Type	U.L.
24 (7x32)	P.E.	.018	.020	.130x.260	300	35	Spiral	2629
22 (16x34)	P.E.	.023	.023	.225	400	32	Spiral	2092
22 (solid)	PVC	.011	.020	.170	300	38	Spiral	2095
22 (7x30)	PVC	.012	.020	.160	300	40	Spiral	CL2
20 (10x30)	PVC	.012	.020	.180	300	47	Spiral	CL2
18 (16x30)	PVC	.012	.020	.205	300	53	Spiral	2552

pvc jacketed mylar aluminum shielded three conductor cable (UL) CL2

Gauge and Strand	Insul. Type	Insul. Wall	Jacket Wall	O.A. Dia.	Volts	Cap. pF/Ft.	Shield Type	U.L.
22 (7x30)	P.E.	.016	.025	.190	350	23	Mylar Al.	CL2
20 (10x30)	P.E.	.016	.028	.210	450	27	Mylar Al.	2093
18 (16x30)	P.E.	.018	.028	.240	450	24	Mylar Al.	CL2
16 (26x30)	P.E.	.030	.030	.318	450	29	Mylar Al.	2093
14 (41x30)	P.E.	.030	.335	.330	450	36	Mylar Al.	2093

pvc jacketed tin copper shielded three conductor cable (UL) CL2

Gauge and Strand	Insul. Type	Insul. Wall	Jacket Wall	O.A. Dia.	Volts	Cap. pF/Ft.	Shield Type	U.L.
20 (26x34)	P.E.	.015	.020	.220	350	45	Braid	2725
22 (7x30)	P.E.	.015	.025	.195	350	35	Spiral	CL2

"low-cap" insulated overall foil and braid multi-conductor cable

24 gauge stranded style 2919 (UL) CL2

Gauge and Strand	No. of Cond.	Insul. Wall	Jacket Wall	O.A. Dia.	Cap pF/Ft.
24 (7x32)	3	.015	.032	.203	12.5
24 (7x32)	4	.015	.032	.217	12.5
24 (7x32)	5	.015	.032	.231	12.5
24 (7x32)	6	.015	.032	.249	12.5
24 (7x32)	7	.015	.032	.255	12.5
24 (7x32)	8	.015	.032	.265	12.5
24 (7x32)	9	.015	.032	.285	12.5
24 (7x32)	10	.015	.032	.303	12.5
24 (7x32)	15	.015	.032	.341	12.5
24 (7x32)	25	.015	.032	.411	12.5
24 (7x32)	37	.015	.032	.475	12.5

miniature RG-62 type multi-coaxial cables UL AWM style 2385 & 2386 VW-1 (UL) CL2

RG Type	No. of Cond.	Center Cond.	Insul.	Shield	Jacket Type	O.D. Diam.	Imp. Ohms
RG-62	34	26GA T.C.	Poly	95% TC	PVC	1.230	93

Pan-International Industrial Corp.

World-Wide Leader in

Molded Cable Assemblies, Interconnect and Wire Harness

PAN's vertically integrated manufacturing system is one of the largest, off-shore factories which handles wire and cable fabrication, mold tooling, connector manufacturing and complete cable assembly, all in-house! Our workforce of over 600 assembly and manufacturing personnel along with our Technical and Support Team of over 100 offer the highest quality products, with reliable service and support. Our world-wide manufacturing and technical support centers in Taiwan, Malaysia and the U.S. extend our service abilities to the entire world including the U.S.A., Europe and Asia.

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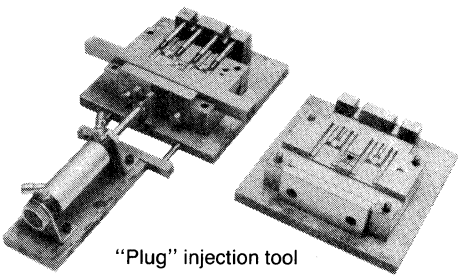
For your custom OEM molded cable applications and requirements, let our Technical Support Team help you develop the exact cable assembly you need. Custom and special connector requirements, strain relief molds to fit your application are available. We specialize in making your product requirement to meet UL, CL2, CSA and FCC specifications and approvals.

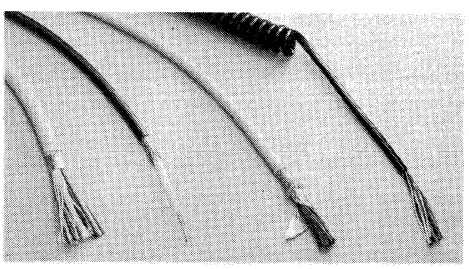


"Plug" injection tool

CABLE FABRICATION

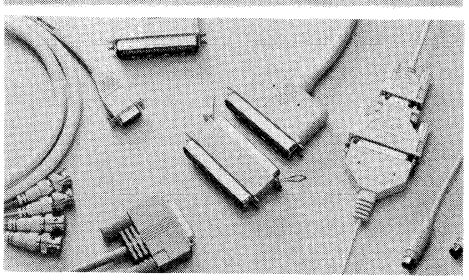
Our in-house integrated manufacturing begins at the wire and cable fabrication. We draw our own wire, custom plate, have braiding and weaving ability, jacket and extrude the insulation.

All to exacting UL and industry standard specifications. Our capabilities include PVC, P-P, PU, Neoprene style wire in standard configurations as well as in custom combinations.



CABLE ASSEMBLY

Computer, commercial, industrial and medical applications for molded cable assemblies using all styles of standard and special connector configurations. Our customer applications include almost every style computer and peripheral connection, including D-subs, DIN, Mini-din, and card edge connectors. Our products are well known for use in the OEM keyboard, mouse, disk drive, modem, video monitor, joystick, SCSI, microphone, and medical sensor markets.



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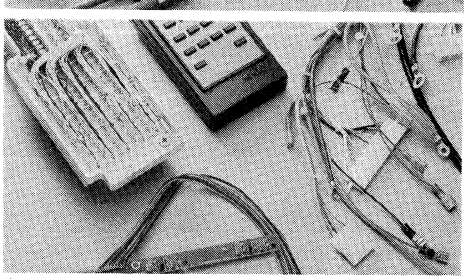
We take pride in our wire harness and custom wiring products used in many applications. Power and control harness assemblies including PCB and other electronic assembly is a major product we supply to your custom prints.



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In Northern California: (415) 967-0293

OUR FAMILY OF FACTORIES INCLUDE:

- Pan-International (Taiwan or Malaysia) – Molded Cables, Interconnect and Wire Harness
- Uniform Ind. Corp. (Taiwan) – OEM product development and service with facilities for SMT, COB and thru-hole PCB assy.
- Congreat Ent. Co. (Taiwan) – Tooling metal parts, plastic injection molded parts and a full range of connectors.

Belden Wire and Cable

BELDEN

Belden manufactures quality cables for a wide range of commercial and industrial applications. The cables contained in this catalog represent only a small portion of Belden's standard product line. For information on special custom design requirements, contact our OEM sales office at **1-800-BELDEN-2**. For a more complete listing, contact your local Belden Distributor or call toll-free **1-800-BELDEN-1**.

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Multi-Conductor
Unshielded

BELDEN

Control, Audio, and Computer Cables For EIA RS-232 Applications

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm

22 Gage
Stranded Conductors (7x30)
PVC Insulated

Product Description
Tinned copper, PVC insulated, conductors cabled. Chrome PVC jacket.

2576
150V 80°C

8443 NEC CM FT 4	3	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	2.1 9.0 8.9 17.5 18.0	.010	.25	.032	.81	.172	4.37
					Color code: Black, Red, Green.					
8444 NEC CM FT 4	4	100 250 U-500 500 U-1000 1000	30.4 76.2 U-152.4 152.4 U-304.8 304.8	2.4 5.8 11.2 10.9 21.5 22.2	.010	.25	.032	.81	.185	4.70
					Color code chart No. 1, Technical Information Section. **For Plenum versions, see 82444 or 88444 in Belden Master Catalog.**					
8445 NEC CM FT 4	5	100 250 U-500 500 U-1000 1000	30.4 76.2 U-152.4 152.4 U-304.8 304.8	2.8 6.7 12.6 12.4 25.1 25.9	.010	.25	.032	.81	.194	4.93
					Color code chart No. 1, Technical Information Section.					

22 Gage (cont'd.)
Stranded Conductors

2576
150V 80°C

9430 NEC CM FT 4	7	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	16.6 17.3 32.2 33.1	.010	.25	.032	.81	.214	5.44
					Color code chart No. 1, Technical Information Section.					
9421 NEC CM FT 4	8	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	4.1 18.5 19.1 36.1 37.0	.010	.25	.032	.81	.229	5.82
					Color code chart No. 1, Technical Information Section.					
9423 NEC CM FT 4	9	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	4.5 21.0 21.7 41.0 42.0	.010	.25	.032	.81	.244	6.20
					Color code chart No. 1, Technical Information Section.					
8456 NEC CM FT 4	10	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	5.1 24.1 24.9 47.2 50.2	.010	.25	.032	.81	.264	6.71
					Color code chart No. 1, Technical Information Section.					
8457 NEC CM FT 4	12	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	5.6 25.6 26.3 50.1 53.1	.010	.25	.032	.81	.272	6.91
					Color code chart No. 1, Technical Information Section.					
8458 NEC CM FT 4	15	100 500 1000	30.4 152.4 304.8	7.8 36.0 76.8	.010	.25	.040	1.02	.315	8.00
					Color code chart No. 2R, Technical Information Section.					
9431 NEC CM FT 4	20	100 500 1000	30.4 152.4 304.8	9.0 43.7 90.9	.010	.25	.040	1.02	.345	8.76
					Color code chart No. 2R, Technical Information Section.					
8459 NEC CM FT 4	25	100 500 1000	30.4 152.4 304.8	10.9 53.1 106.2	.010	.25	.040	1.02	.387	9.83
					Color code chart No. 2R, Technical Information Section.					

Multi-Conductor
Unshielded

BELDEN

Control, Audio, and Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm
22 Gage (cont'd.) Stranded Conductors (7x30) **PVC Insulated**											
	9432 **NEC** CM FT 4	30	100 500 1000	30.4 152.4 304.8	12.3 62.9 119.7	.010	.25	.040	1.02	.400	10.16
2576 150V 80°C	**9433** **NEC** CM FT 4	40	100 500 1000	30.4 152.4 304.8	16.5 82.8 162.8	.010	.25	.040	1.02	.455	11.56
	9434 **NEC** CM FT 4	50	500 1000	152.4 304.8	101.2 201.5	.010	.25	.045	1.14	.500	12.70

Product Description
Tinned copper, PVC insulated, conductors cabled. Chrome PVC jacket. Color code chart No. 2R, Technical Information Section.

Control and Audio Cables

20 Gage Stranded Conductors (7x28) **PVC Insulated**											
	9444 **NEC** CM FT 4	4	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.3 15.5 16.2 30.1 31.0	.013	.33	.032	.81	.217	5.51
						Color code chart No. 1, Technical Information Section.					
2464 300V 80°C	**9445** **NEC** CM FT 4	5	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	4.1 18.5 18.7 36.2 36.8	.013	.33	.032	.81	.239	6.07
						Color code chart No. 1, Technical Information Section.					
	9439 **NEC** CM FT 4	7	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	5.2 23.7 24.5 46.4 49.4	.013	.33	.032	.81	.260	6.60
						Color code chart No. 1, Technical Information Section.					
	9455 **NEC** CM FT 4	9	100 500 1000	30.4 152.4 304.8	6.8 32.6 68.5	.013	.33	.035	.89	.317	8.05
						Color code chart No. 1, Technical Information Section.					
	9457 **NEC** CM FT 4	12	100 500 1000	30.4 152.4 304.8	8.2 39.4 82.8	.013	.33	.035	.89	.338	8.59
						Color code chart No. 1, Technical Information Section.					
	9458 **NEC** CM FT 4	15	100 500 1000	30.4 152.4 304.8	11.3 53.2 104.5	.013	.33	.040	1.02	.389	9.88
						Color code chart No. 2, Technical Information Section.					

Product Description
Tinned copper, PVC insulated, conductors cabled. Chrome PVC jacket. Color code chart No. 1, Technical Information Section.

[redacted]

Multi-Conductor
Unshielded

BELDEN

Control and Audio Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm

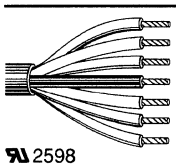
19 Gage
Solid Conductors (16x30)
PVC Insulated

Product Description
Bare copper, PVC insulated, conductors cabled. Chrome PVC jacket. Suggested working voltage: 300V.

	8487 **NEC** CM FT 4	3	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	13.0 12.8 25.0 25.8	.015	.38	.025	.64	.192	4.88
						Color code: Brown, Gray, Tan.					

18 Gage
Stranded Conductors (16x30)
PVC Insulated

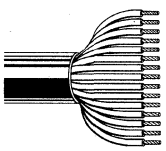
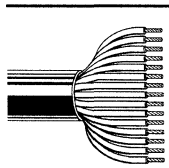
Product Description
Tinned copper, PVC insulated, conductors cabled. Chrome PVC jacket.

	**8489** **NEC** CM FT 4	4	100 250 U-500 500 U-1000 1000	30.4 76.2 U-152.4 152.4 U-304.8 304.8	5.1 11.8 23.1 23.9 45.2 48.3	.018	.46	.032	.81	.264	6.71
						Color code chart No. 1, Technical Information Section. **For Plenum versions, see 82489 or 88489 in Belden Master Catalog.**					
ℛ 2598 300V 60°C	**8465** **NEC** CM FT 4	5	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	6.1 28.7 29.2 56.3 60.3	.018	.46	.033	.84	.290	7.37
						Color code chart No. 1, Technical Information Section.					
	8467 **NEC** CM FT 4	7	100 250 500 1000	30.4 76.2 152.4 304.8	8.0 19.7 38.6 81.0	.018	.46	.037	.94	.324	8.23
						Color code chart No. 1, Technical Information Section.					
	8469 **NEC** CM FT 4	9	100 250 500 1000	30.4 76.2 152.4 304.8	10.1 25.7 51.8 103.7	.018	.46	.037	.94	.379	9.63
						Color code chart No. 1, Technical Information Section.					
	8466 **NEC** CM FT 4	12	100 250 500 1000	30.4 76.2 152.4 304.8	12.6 31.3 64.1 126.1	.018	.46	.040	1.02	.424	10.77
						Color code chart No. 2R, Technical Information Section.					
	8468 **NEC** CM FT 4	15	100 500 1000	30.4 152.4 304.8	17.6 87.9 172.8	.018	.46	.045	1.14	.505	12.83
						Color code chart No. 2R, Technical Information Section.					
	8619 **NEC** CM FT 4	19	100 500 1000	30.4 152.4 304.8	20.1 99.3 195.0	.018	.46	.045	1.14	.505	12.83
						Color code chart No. 2R, Technical Information Section.					
	9626 **NEC** CM FT 4	25	100 500 1000	30.4 152.4 304.8	27.1 134.9 270.8	.018	.46	.060	1.52	.620	15.75
						Color code chart No. 2R, Technical Information Section.					

Multi-Conductor
Unshielded

BELDEN

Control and Audio Cables

Description	Trade No. C.S.A. Cert.	No. of Cond.	Standard Lengths		Std. Unit Lbs. ea.	Insulation Thickness		Jacket Thickness		Nominal O.D.	
			ft.	m		Inch	mm	Inch	mm	Inch	mm
16 Gage Stranded Conductors (19x29) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, conductors cabled. Chrome PVC jacket. Suggested working voltage: 600V.					
 80°C	**8620†** FT 1	4	100 500 1000	30.4 152.4 304.8	8.7 42.2 87.9	.031	.79	.045	1.14	.375	9.53
						Color code chart No. 2, Technical Information Section.					
	9620† FT 1	5	100 500 1000	30.4 152.4 304.8	10.5 53.9 103.0	.031	.79	.045	1.14	.405	10.29
						Color code chart No. 2, Technical Information Section.					
	8621† FT 1	7	100 500 1000	30.4 152.4 304.8	14.1 69.9 138.8	.031	.79	.045	1.14	.450	11.43
						Color code chart No. 2R, Technical Information Section.					
	9721† FT 1	8	100 500 1000	30.4 152.4 304.8	15.9 78.8 154.8	.031	.79	.045	1.14	.495	12.57
						Color code chart No. 2R, Technical Information Section.					
	9621† FT 1	9	100 500 1000	30.4 152.4 304.8	17.7 87.7 171.3	.031	.79	.045	1.14	.520	13.21
						Color code chart No. 2R, Technical Information Section.					
	8622† FT 1	12	100 500 1000	30.4 152.4 304.8	23.7 117.6 236.2	.031	.79	.060	1.52	.610	15.49
						Color code chart No. 2R, Technical Information Section.					
	8623† FT 1	15	100 500 1000	30.4 152.4 304.8	28.9 146.9 286.8	.031	.79	.060	1.52	.670	17.02
						Color code chart No. 2R, Technical Information Section.					
	8624† FT 1	19	100 500 1000	30.4 152.4 304.8	36.3 172.5 349.1	.031	.79	.065	1.65	.700	17.78
						Color code chart No. 2R, Technical Information Section.					
	9622† FT 1	25	100 500 1000	30.4 152.4 304.8	46.9 226.4 460.7	.031	.79	.065	1.65	.850	21.59
						Color code chart No. 2R, Technical Information Section.					
14 Gage Stranded Conductors (19x27) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, conductors cabled. Chrome PVC jacket. Suggested working voltage: 600V. Color code chart No. 2, Technical Information Section.					
 80°C	**8627†** FT 1	4	100 500 1000	30.4 152.4 304.8	14.2 71.6 140.3	.045	1.14	.045	1.14	.476	12.09
	9623† FT 1	5	100 500 1000	30.4 152.4 304.8	19.1 94.1 189.2	.045	1.14	.060	1.52	.557	14.15
	8628† FT 1	7	100 500 1000	30.4 152.4 304.8	23.9 118.7 238.3	.045	1.14	.060	1.52	.605	15.37
	8629† FT 1	12	100 500 1000	30.4 152.4 304.8	40.9 201.8 397.2	.045	1.14	.065	1.65	.800	20.32

† Passes VW-1 Vertical Wire Flame Test.

[redacted]

Multi-Conductor
Overall Beldfoil® Shield

BELDEN

Roadway Loop Cable

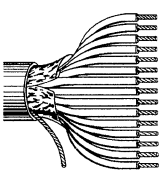
Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	(Strand-ing)	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
14 Gage Stranded Conductors (104x34) **High Density Polyethylene Insulated** 105°C	**9438**	1	1000	304.8	14.6	(104x34)	.032	.81	—	—	.139	3.53	—	—	—	—

Product Description: Tinned copper conductor. Black high density polyethylene insulation. Suggested working voltage: 600V.

Sound, Broadcast, Audio, Instrumentation, and Computer Cables For EIA RS-232 Applications

24 Gage
Stranded Conductors (7x32)
S-R PVC Insulated

Product Description
Tinned copper, S-R PVC insulated, conductors cabled. Beldfoil aluminum-polyester shield with 24 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code chart No. 1, Technical Information Section.



Beldfoil
100% Shield Coverage
UL 2464
300V 80°C
CSA Type T2

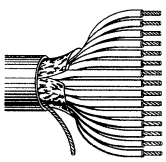
9533 **NEC** CM PCC FT 4	3	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	2.1 9.5 9.1 17.8 18.5	(7x32)	.010	.25	.035	.89	.168	4.27	33	108	65	213
9534 **NEC** CM PCC FT 4	4	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	2.4 10.9 13.4 21.3 22.1	(7x32)	.010	.25	.035	.89	.190	4.83	33	108	65	213
9535 **NEC** CM PCC FT 4	5	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	2.7 12.6 13.5 24.1 25.9	(7x32)	.010	.25	.035	.89	.195	4.95	33	108	65	213
9536 **NEC** CM PCC FT 4	6	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	3.0 14.4 15.0 27.8 28.7	(7x32)	.010	.25	.035	.89	.215	5.46	33	108	65	213
9537 **NEC** CM PCC FT 4	7	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	3.2 15.3 15.7 30.0 30.5	(7x32)	.010	.25	.035	.89	.215	5.46	33	108	65	213
9538 **NEC** CM PCC FT 4	8	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	3.8 17.3 17.9 33.5 34.4	(7x32)	.010	.25	.035	.89	.230	5.84	33	108	65	213
9539 **NEC** CM PCC FT 4	9	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	4.2 19.2 19.5 37.5 38.6	(7x32)	.010	.25	.035	.89	.250	6.35	30	98	55	180

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

Multi-Conductor
Overall Beldfoil® Shield

BELDEN

Sound, Broadcast, Audio, Instrumentation, and Computer Cables For EIA RS-232 Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	(Stranding)	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	* pF/m	** pF/ft.	** pF/m
24 Gage Stranded Conductors (7x32) **S-R PVC Insulated**							**Product Description** Tinned copper, S-R PVC insulated, conductors cabled. Beldfoil aluminum-polyester shield with 24 AWG stranded tinned copper drain wire. Chrome PVC jacket.									
 Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**9540** **NEC** CM PCC FT 4	10	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	4.5 20.2 20.9 39.3 40.3	24 (7x32)	.010	.25	.035	.89	.250	6.35	30	98	55	180
			Color code chart No. 1, Technical Information Section.													
	9541 **NEC** CM PCC FT 4	15	100 U-500 500 U-1000 1000	30.4 152.4 152.4 304.8 304.8	5.9 29.3 27.9 57.7 61.0	24 (7x32)	.010	.25	.035	.89	.290	7.37	30	98	55	180
			Color code chart No. 2R, Technical Information Section.													
	9542 **NEC** CM PCC FT 4	20	100 U-500 500 1000	30.4 152.4 152.4 304.8	7.2 33.9 34.8 70.8	24 (7x32)	.010	.25	.035	.89	.320	8.13	30	98	55	180
			Color code chart No. 2R, Technical Information Section.													
	9543 **NEC** CM PCC FT 4	25	100 500 1000	30.4 152.4 304.8	8.9 45.5 90.5	24 (7x32)	.010	.25	.042	1.07	.360	9.14	30	98	55	180
			Color code chart No. 2R, Technical Information Section.													
	9544 **NEC** CM PCC FT 4	30	100 500 1000	30.4 152.4 304.8	10.2 51.0 101.6	24 (7x32)	.010	.25	.040	1.02	.380	9.65	30	98	55	180
			Color code chart No. 2R, Technical Information Section.													
	9545 **NEC** CM PCC FT 4	40	100 500 1000	30.4 152.4 304.8	13.6 64.8 132.7	24 (7x32)	.010	.25	.040	1.02	.430	10.92	30	98	55	180
			Color code chart No. 2R, Technical Information Section.													
	9546 **NEC** CM PCC FT 4	50	100 500 1000	30.4 152.4 304.8	16.5 81.5 165.0	24 (7x32)	.010	.25	.045	1.14	.490	12.45	30	98	55	180
			Color code chart No. 2R, Technical Information Section.													

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

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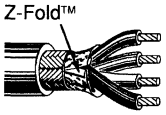
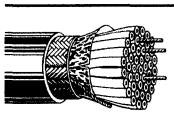
BELDEN

Multi-Conductor
Overall Foil/Braid Shield

Computer Cables
For EIA RS-232 and CAD/CAM Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
24 Gage Stranded Conductors (7x32) **S-R PVC Insulated**													
Z-Fold™  Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**9608** **NEC** CM PCC FT 4	3	100 500 1000	30.4 152.4 304.8	2.5 12.2 22.8	24 (7x32) 24.0Ω/M′ 78.7Ω/km	8.6Ω/M′ 28.2Ω/km	.190	4.83	35	115	65	180
								Color code chart No. 1, Technical Information Section.					
	9609 **NEC** CM PCC FT 4	4	100 500 1000	30.4 152.4 304.8	2.9 13.7 25.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	9.8Ω/M′ 32.2Ω/km	.200	5.08	35	115	65	180
								Color code chart No. 1, Technical Information Section.					
	9610 **NEC** CM PCC FT 4	5	100 500 1000	30.4 152.4 304.8	3.3 15.7 30.1	24 (7x32) 24.0Ω/M′ 78.7Ω/km	6.5Ω/M′ 21.3Ω/km	.215	5.46	35	115	65	180
								Color code chart No. 1, Technical Information Section.					
	9611 **NEC** CM PCC FT 4	6	100 500 1000	30.4 152.4 304.8	3.8 17.7 33.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	7.0Ω/M′ 23.0Ω/km	.225	5.72	30	98.4	55	180
								Color code chart No. 1, Technical Information Section.					
	9612 **NEC** CM PCC FT 4	7	100 500 1000	30.4 152.4 304.8	4.0 18.6 35.7	24 (7x32) 24.0Ω/M′ 78.7Ω/km	6.9Ω/M′ 22.6Ω/km	.225	5.72	30	98.4	55	180
								Color code chart No. 1, Technical Information Section.					
	9613 **NEC** CM PCC FT 4	8	100 500 1000	30.4 152.4 304.8	4.4 20.9 39.8	24 (7x32) 24.0Ω/M′ 78.7Ω/km	7.3Ω/M′ 23.9Ω/km	.240	6.10	30	98.4	55	180
								Color code chart No. 1, Technical Information Section.					
	9614 **NEC** CM PCC FT 4	9	100 500 1000	30.4 152.4 304.8	4.8 22.7 43.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	7.5Ω/M′ 24.6Ω/km	.253	6.43	30	98.4	55	180
								Color code chart No. 1, Technical Information Section.					
	9615 **NEC** CM PCC FT 4	10	100 500 1000	30.4 152.4 304.8	5.1 23.9 48.2	24 (7x32) 24.0Ω/M′ 78.7Ω/km	6.9Ω/M′ 22.6Ω/km	.270	6.86	30	98.4	55	180
								Color code chart No. 1, Technical Information Section.					
	9616 **NEC** CM PCC FT 4	15	100 500 1000	30.4 152.4 304.8	6.7 32.1 65.5	24 (7x32) 24.0Ω/M′ 78.7Ω/km	6.0Ω/M′ 19.7Ω/km	.300	7.62	30	98.4	55	180
								Color code chart No. 2R, Technical Information Section.					
	9617 **NEC** CM PCC FT 4	25	100 500 1000	30.4 152.4 304.8	9.8 49.7 98.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	5.1Ω/M′ 16.7Ω/km	.370	9.40	30	98.4	55	180
								Color code chart No. 2R, Technical Information Section.					
 Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**9618** **NEC** CM PCC FT 4	37	100 500 1000	30.4 152.4 304.8	13.0 65.5 131.1	24 (7x32) 24.0Ω.M′ 78.7Ω/km	4.4Ω/M′ 14.4Ω/km	.411	10.44	30	98.4	55	180
								Color code chart No. 2R, Technical Information Section.					
	9619 **NEC** CM PCC FT 4	50	100 500 1000	30.4 152.4 304.8	17.7 87.4 171.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.3Ω/M′ 14.1Ω/km	.485	12.32	30	98.4	55	180
								Color code chart No. 2R, Technical Information Section.					

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

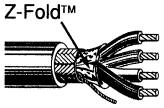
Product Description
Tinned copper, S-R PVC insulated, multi-conductor cable with overall Beldfoil® aluminum-polyester plus 65% minimum tinned copper braid shield. Chrome PVC jacket.

Multi-Conductor
Overall Foil/Braid Shield

Datalene® insulation features are low dielectric constant and a dissipation factor for high-speed, low-distortion data handling. Physical properties include good crush resistance and light weight.

COOPER INDUSTRIES **BELDEN**

Computer Cables
Low Capacitance Cables for EIA RS-232, EIA RS-423, and CAD/CAM Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Datalene Insulated**														
Z-Fold™  Beldfoil 100% Shield Coverage UL 2919 30V 80°C	**9925** **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	2.9 14.1 26.7	24 (7x32) 24.0Ω/M′ 78.7Ω/km	5.18Ω/M′ 17.0Ω/km	.215	5.46	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9927 **NEC** CM PCC FT 1	4	100 500 1000	30.4 152.4 304.8	3.5 15.9 30.3	24 (7x32) 24.0Ω/M′ 78.7Ω/km	5.31Ω/M′ 17.4Ω/km	.230	5.84	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9929 **NEC** CM PCC FT 1	5	100 500 1000	30.4 152.4 304.8	3.7 17.2 32.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.23Ω/M′ 13.9Ω/km	.246	6.25	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9931 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	4.3 20.1 40.6	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.4Ω/M′ 14.4Ω/km	.265	6.73	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9932 **NEC** CM PCC FT 1	7	100 500 1000	30.4 152.4 304.8	4.4 20.7 42.0	24 (7x32) 24.0Ω/M′ 78.7Ω /km	4.41Ω/M′ 14.5Ω/km	.265	6.73	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9933 **NEC** CM PCC FT 1	8	100 500 1000	30.4 152.4 304.8	5.9 22.9 46.3	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.40Ω/M′ 14.4Ω/km	.280	7.11	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9934 **NEC** CM PCC FT 1	9	100 500 1000	30.4 152.4 304.8	5.3 25.5 52.3	24 (7x32) 24.0Ω /M′ 78.7Ω/km	3.85Ω/M′ 12.6Ω /km	.300	7.62	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9935 **NEC** CM PCC FT 1	10	100 500 1000	30.4 152.4 304.8	5.8 27.5 56.4	24 (7x32) 24.0Ω M′ 78.7Ω/km	3.18Ω/M′ 10.4Ω/km	.306	7.77	78%	12	39.4	22	72.2
								Color code chart No. 1, Technical Information Section.						
	9936 **NEC** CM PCC FT 1	15	100 500 1000	30.4 152.4 304.8	7.2 34.1 73.0	24 (7x32) 24.0Ω /M′ 78.7Ω/km	3.56Ω/M′ 11.7Ω/km	.360	9.14	78%	12	39.4	22	72.2
								Color code chart No. 2R, Technical Information Section.						
	9937 **NEC** CM PCC FT 1	25	100 500 1000	30.4 152.4 304.8	11.2 53.0 104.0	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.77Ω/M′ 9.1Ω/km	.445	11.30	78%	12	39.4	22	72.2
								Color code chart No. 2R, Technical Information Section.						
	9938 **NEC** CM PCC FT 1	37	100 500 1000	30.4 152.4 304.8	14.5 71.3 139.7	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.37Ω/M′ 7.8Ω /km	.500	12.10	78%	12	39.4	22	72.2
								Color code chart No. 2R, Technical Information Section.						

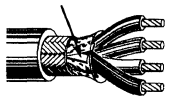
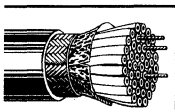
* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

[redacted]

Multi-Conductor
Overall Foil/Braid Shield

BELDEN

Computer Cables
For EIA RS-232 and CAD/CAM Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	* pF/m	** pF/ft.	** pF/m
22 Gage Stranded Conductors (7x30) **S-R PVC Insulated**	**Product Description** Tinned copper, S-R PVC insulated, multi-conductor cable with overall Beldfoil® aluminum-polyester plus 65% minimum tinned copper braid shield. Chrome PVC jacket.												
Z-Fold™  Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**9939** **NEC** CM PCC FT 4	3	100 500 1000	30.4 152.4 304.8	3.0 14.6 27.8	22 (7x30) 16Ω/M' 49.2Ω/km	6.2Ω/M' 20.4Ω/km	.202	5.13	37	122	67	220
	Color code chart No. 1, Technical Information Section												
	9940 **NEC** CM PCC FT 4	4	100 500 1000	30.4 152.4 304.8	3.4 16.7 32.0	22 (7x30) 16Ω/M' 49.2Ω/km	5.0Ω/M' 16.4Ω/M'	.215	5.46	37	122	67	220
	Color code chart No. 1, Technical Information Section.												
	9941 **NEC** CM PCC FT 4	5	100 500 1000	30.4 152.4 304.8	4.1 19.2 37.0	22 (7x30) 16Ω/M' 49.2Ω/km	7.1Ω/M' 23.3Ω/km	.230	5.84	37	122	67	220
	Color code chart No. 1, Technical Information Section.												
	9942 **NEC** CM PCC FT 4	6	100 500 1000	30.4 152.4 304.8	4.6 21.7 41.9	22 (7x30) 16Ω/M' 49.2Ω/km	7.9Ω/M' 25.9Ω/km	.245	6.22	35	115	63	207
	Color code chart No. 1, Technical Information Section.												
	9943 **NEC** CM PCC FT 4	7	100 500 1000	30.4 152.4 304.8	4.8 22.9 44.3	22 (7x30) 16Ω/km 49.2Ω/km	7.0Ω/M' 25.9Ω/km	.245	6.22	35	115	63	207
	Color code chart No. 1, Technical Information Section.												
	9944 **NEC** CM PCC FT 4	8	100 500 1000	30.4 152.4 304.8	5.4 25.5 49.5	22 (7x30) 16Ω/M' 49.2Ω/km	6.0Ω/M' 16.7Ω/km	.260	6.60	35	115	63	207
	Color code chart No. 1, Technical Information Section.												
	9945 **NEC** CM PCC FT 4	9	100 500 1000	30.4 152.4 304.8	5.9 28.1 56.8	22 (7x30) 16Ω/M' 49.2Ω/km	5.1Ω/M' 16.7Ω/km	.280	7.11	35	115	63	207
	Color code chart No. 1, Technical Information Section.												
	9946 **NEC** CM PCC FT 4	10	100 500 1000	30.4 152.4 304.8	6.4 30.8 62.9	22 (7x30) 16Ω/M' 49.2Ω/km	4.6Ω/M' 15.1Ω/km	.300	7.62	35	115	63	207
	Color code chart No. 1, Technical Information Section.												
	9947 **NEC** CM PCC FT 4	15	100 500 1000	30.4 152.4 304.8	8.6 41.5 86.5	22 (7x30) 16Ω/M' 49.2Ω/km	4.1Ω/M' 13.5Ω/M'	.340	8.64	35	115	63	207
	Color code chart No. 2R, Technical Information Section.												
 Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**9948** **NEC** CM PCC FT 4	25	100 500 1000	30.4 152.4 304.8	12.5 64.2 126.5	22 (7x30) 16Ω/M' 49.2Ω/km	3.1Ω/M' 10.2Ω/km	.410	10.41	35	115	63	207
	Color code chart No. 2R, Technical Information Section.												
	9949 **NEC** CM PCC FT 4	37	100 500 1000	30.4 152.4 304.8	17.8 116.1 178.9	22 (7x30) 16Ω/M' 49.2Ω/km	2.7Ω/M' 7.5Ω/M'	.460	11.68	35	115	63	207
	Color code chart No. 2R, Technical Information Section.												
	9950 **NEC** CM PCC FT 4	50	100 500 1000	30.4 152.4 304.8	23.3 116.1 233.3	22 (7x30) 16Ω/M' 49.2Ω/km	2.3Ω/M' 7.5Ω/km	.555	14.10	35	115	63	207
	Color code chart No. 2R, Technical Information Section.												

* Capacitance between adjacent conductors.
** Capacitance between one conductor and other conductors connected to shield.

Paired
Unshielded

BELDEN

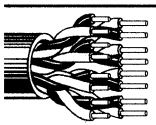
Sound and Control Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm

22 Gage
Solid Conductors
PVC Insulated

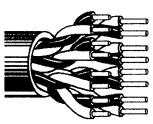
Product Description

Tinned copper, PVC insulated, twisted pairs. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.



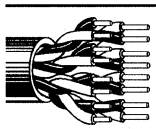
UL 2576

8740 NEC CM FT 4	1	U-500 U-1000	U-152.4 U-304.8	7.7 14.3	.010	.25	.025	.64	.146	3.71



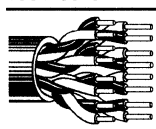
UL 2576
300V 80°C

8741 NEC CM FT 4	2	U-500 U-1000 1000	U-152.4 U-304.8 304.8	13.1 25.0 25.0	.010	.25	.032	.81	.237	6.02
					For Plenum versions, see 82741 or 88741 in Belden Master Catalog.					
8742 NEC CM FT 4	3	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.9 17.6 18.3 34.2 39.7	.010	.25	.032	.81	.250	6.35
					For Plenum versions, see 82742 or 88742 in Belden Master Catalog.					
8757 NEC CM FT 4	4	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	22.3 23.1 43.6 47.6	.010	.25	.032	.81	.272	6.91
					For Plenum versions, see 82757 or 88757 in Belden Master Catalog.					
9158 NEC CM FT 4	5	100 500 1000	30.4 152.4 304.8	5.9 27.9 57.0	.010	.25	.040	1.02	.268	6.81



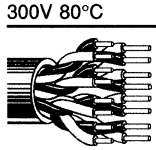
UL 2576
150V 80°C

8743 NEC CM FT 4	6	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	5.5 26.1 27.0 51.3 55.6	.010	.25	.035	.89	.305	7.75
					For Plenum version, see 88753 in Belden Master Catalog.					



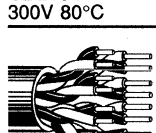
UL 2576
300V 80°C

9160 NEC CM FT 4	8	500 1000	152.4 304.8	38.9 81.2	.010	.25	.035	.89	.328	8.33



UL 2464
300V 80°C

8744 NEC CM FT 4	9	100 500 1000	30.4 152.4 304.8	8.0 38.0 74.3	.010	.25	.037	.94	.354	8.99



UL 2576
150V 80°C

8753 NEC CM FT 4	11	100 500 1000	30.4 152.4 304.8	9.3 47.8 93.5	.010	.25	.032	.81	.386	9.80
8754 NEC CM FT 4	13	100 500 1000	30.4 152.4 304.8	10.5 54.3 106.6	.010	.25	.037	.94	.394	10.01
8745 NEC CM FT 4	15	100 500 1000	30.4 152.4 304.8	12.8 61.2 120.4	.010	.25	.040	1.02	.420	10.67

[redacted]

Paired
Unshielded

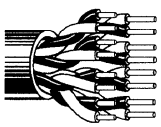
BELDEN

Sound and Control Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm

22 Gage (cont'd.)
Solid Conductors
PVC Insulated

Product Description
Tinned copper, PVC insulated, twisted pairs. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.

	**8755** NEC CM FT 4	19	100 500 1000	30.4 152.4 304.8	15.7 76.7 151.2	.010	.25	.040	1.02	.470	11.94
	8756 NEC CM FT 4	23	1000	304.8	176.5	.010	.25	.040	1.02	.495	12.57
ℛ 2576 150V 80°C	**8746** NEC CM FT 4	27	500✉ 1000✉	152.4 304.8	105.5 212.0	.010	.25	.045	1.14	.535	13.59

Sound and Control Cables

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Cond.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm

22 Gage
Solid Conductors
Polyethylene Insulated

Product Description
Bare Copper, polyethylene insulated, conductors cabled. Rose Gray PVC jacket. Color code: Red, Green.

	8795 NEC CM FT 1	2	U-500 U-1000 1000	U-152.4 U-304.8 304.8	8.2 15.5 16.1	.018	.46	.022	.56	.168	4.27
ℛ 2092 300V 60°C											

22 Gage
Stranded Conductors (7x30)
PVC Insulated

Product Description
Tinned copper, PVC insulated, twisted pair, PVC jacket. Color code: Black, Red.

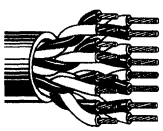
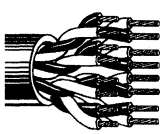
	8442 NEC CM FT 4	2	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	1.8 7.9 7.4 14.7 15.4	.015	.38	.025	.64	.170	4.32
						For Plenum versions, see 82442 or 88442 in Belden Master Catalog. Color code: Black, Red, Chrome, Light Beige.					

✉ Spools are one piece, but length may vary –0 +20% from length shown.

BELDEN

Paired
Unshielded

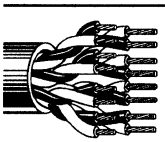
Sound and Control Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm
20 Gage Stranded Conductors (7x28.5) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pairs. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.					
	**8205** **NEC** CM FT 4	1	100 Chrome	30.4	2.1	.018	.46	.025	.64	.190	4.83
			U-500 Chrome Lt. Beige	U-152.4	9.5						
			500 Chrome Lt. Beige	152.4	9.3						
			U-1000 Chrome	U-304.8	18.0						
			1000 Chrome Lt. Beige	304.8	19.0						
	**9750** **NEC** CM FT 4	3	100 500 1000	30.4 152.4 304.8	5.9 25.8 53.2	.013	.33	.040	1.02	.309	7.85
ℛ 2464 300V 80°C	**9751** **NEC** CM FT 4	6	100 500 1000	30.4 152.4 304.8	8.7 45.1 90.2	.013	.33	.040	1.02	.376	9.55
	9752 **NEC** CM FT 4	9	100 500 1000	30.4 152.4 304.8	13.2 65.2 127.0	.013	.33	.040	1.02	.439	11.15
	9755 **NEC** CM FT 4	15	100 500 1000	30.4 152.4 304.8	19.5 97.9 196.8	.013	.33	.040	1.02	.545	13.84
19 Gage Solid Conductors **PVC Insulated**						**Product Description** Bare copper, PVC insulated, twisted pair. Chrome PVC jacket. Suggested working voltage: 350. Color code: Brown, Tan.					
	8486 **NEC** CM FT 4	1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	10.3 10.0 19.6 20.3	.015	.38	.025	.64	.182	4.62

Paired
Unshielded

BELDEN

Sound and Control Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm
18 Gage Stranded Conductors (7x26) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pair. PVC jacket. Color code: Black, White.					
	8461 **NEC** CM FT 4	1	100 Chrome Lt. Beige	30.4	3.3	.020	.51	.028	.71	.234	5.94
			U-500 Chrome Lt. Beige	U-152.4	14.0						
			500 Chrome Lt. Beige	152.4	14.8						
			U-1000 Chrome Lt. Beige	U-304.8	27.2						
			1000 Chrome Lt. Beige	304.8	28.0						
18 Gage Stranded Conductors (16x30) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pairs. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.					
	**9740** **NEC** CM FT 4	1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	14.1 14.8 27.3 28.1	.018	.46	.032	.81	.230	5.84
						For Plenum versions, see 82740 or 89740 in Belden Master Catalog.					
ℛ 2464 300V 80°C	**9156** **NEC** CM FT 4	2	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	22.6 23.6 44.2 48.2	.013	.33	.033	.84	.308	7.82
	8690 **NEC** CM FT 4	3	100 U-500 500 1000	30.4 U-152.4 152.4 304.8	7.5 35.3 36.3 76.2	.018	.46	.037	.94	.371	9.42
	9157 **NEC** CM FT 4	4	100 500 1000	30.4 152.4 304.8	8.4 43.0 85.4	.013	.33	.035	.89	.362	9.19
	9159 **NEC** CM FT 4	5	500 1000	152.4 304.8	56.5 111.0	.013	.33	.050	1.27	.416	10.57
	8691 **NEC** CM FT 4	6	100 500 1000	30.4 152.4 304.8	14.7 71.9 141.0	.018	.46	.040	1.02	.498	12.65
	9161 **NEC** CM FT 4	8	100 500 1000	30.4 152.4 304.8	16.5 81.2 159.5	.013	.33	.050	1.27	.478	12.14

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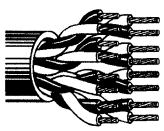
BELDEN

Paired
Unshielded

Sound and Control Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm
18 Gage (cont'd.) Stranded Conductors (16x30) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pairs. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.					
 AVL 2464 300V 80°C	**8692** **NEC** CM FT 4	9	100 500 1000	30.4 152.4 304.8	23.8 107.0 215.0	.018	.46	.050	1.27	.604	15.34
	9741 **NEC** CM FT 4	12	100 500 1000	30.4 152.4 304.8	28.5 135.2 263.3	.018	.46	.050	1.27	.677	17.20
	9742 **NEC** CM FT 4	15	100 500 1000	30.4 152.4 304.8	34.8 165.9 335.8	.018	.46	.060	1.52	.750	19.05
	9743 **NEC** CM FT 4	19	100 500 1000	30.4 152.4 304.8	43.5 213.0 462.0	.018	.46	.070	1.78	.834	21.18
16 Gage Stranded Conductors (19x29) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pair. Chrome PVC jacket. Color code: Black, White.					
 AVL 2598 300V 60°C	**8471** **NEC** CM FT 4	1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	18.9 19.7 37.0 37.9	.023	.58	.031	.79	.272	6.91
14 Gage Stranded Conductors (19x27) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pair. Chrome PVC jacket. Suggested working voltage: 600. Color code: Black, White.					
 80°C	**8473†** FT 1	1	U-500 500 1000	U-152.4 152.4 304.8	29.2 30.0 63.8	.031	.79	.035	.89	.332	8.43
12 Gage Stranded Conductors (19x25) **PVC Insulated**						**Product Description** Tinned copper, PVC insulated, twisted pair. Chrome PVC jacket. Suggested working voltage: 600. Color code: Black, White.					
 80°C	**8477†** FT 1	1	U-500 500 1000	U-152.4 152.4 304.8	41.0 44.8 89.1	.031	.79	.040	1.02	.384	9.75

† Passes VW-1 Vertical Wire Flame Test.

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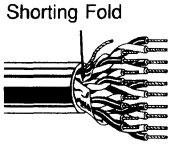
Paired
Overall Beldfoil® Shield

COOPER INDUSTRIES **BELDEN**

Sound, Broadcast, Instrumentation, and Computer Cables For EIA RS-232 Applications

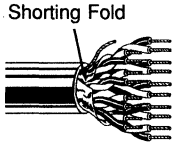
Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
24 Gage Stranded Conductors (7x32)													
Shorting Fold  Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**9501** **NEC** CM PCC FT 4	1	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	1.7 7.7 7.4 14.3 14.0	24 (7x32) 25Ω/M' 78.7Ω/km	18Ω/M' 59.1Ω/km	.156	3.96	40	131	74	243
	9502 **NEC** CM PCC FT 4	2	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.3 15.1 15.8 29.4 30.3	24 (7x32) 25Ω/M' 78.7Ω/km	17Ω/M' 49.9Ω/km	.222	5.64	30	98	50	164
								For Plenum version, see 82502 in Belden Master Catalog.					
	9503 **NEC** CM PCC FT 4	3	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.3 14.7 15.3 28.7 29.6	24 (7x32) 25Ω/M' 78.7Ω/km	17Ω/M' 49.9Ω/km	.232	5.89	30	98	50	164
								For Plenum versions, see 82503 or 89503 in Belden Master Catalog.					

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

BELDEN

Paired
Overall Beldfoil® Shield

Sound, Broadcast, Instrumentation, and Computer Cables For EIA RS-232 Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
24 Gage Stranded Conductors (7x32) **S-R PVC Insulated**													
Shorting Fold  Beldfoil Coverage 100% Shield Coverage AWM 2464 300V 80°C CSA Type T2	**9506** **NEC** CM PCC FT 4	6	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	5.2 24.3 25.2 47.6 52.0	24 (7x32) 25Ω/M′ 78.7Ω/km	16Ω/M′ 49.9Ω/km	.295	7.49	30	98	50	164
								For Plenum version, see 82506 in Belden Master Catalog.					
	9507 **NEC** CM PCC FT 4	7	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	5.8 26.6 27.5 52.3 57.0	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 49.9Ω/km	.300	7.62	30	98	50	164
	9508 **NEC** CM PCC FT 4	8	100 500 1000	30.4 152.4 304.8	6.6 31.6 67.4	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 47.6Ω/km	.330	8.38	30	98	50	164
	9509 **NEC** CM PCC FT 4	9	100 500 1000	30.4 152.4 304.8	7.3 34.7 73.8	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 47.6Ω/km	.340	8.64	30	98	50	164
								For Plenum version, see 82509 in Belden Master Catalog.					
	9510 **NEC** CM PCC FT 4	10	100 500 1000	30.4 152.4 304.8	8.1 41.2 82.0	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 44.3Ω/km	.380	9.65	30	98	50	164
	9515 **NEC** CM PCC FT 4	15	100 500 1000	30.4 152.4 304.8	11.7 55.6 109.1	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 44.3Ω/km	.425	10.80	30	98	50	164
	9519 **NEC** CM PCC FT 4	19	100 500 1000	30.4 152.4 304.8	13.6 67.4 131.7	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 40.7Ω/km	.460	11.68	30	98	50	164
	9525 **NEC** CM PCC FT 4	25	100 500 1000	30.4 152.4 304.8	17.2 85.4 168.2	24 (7x32) 25Ω/M′ 78.7Ω/km	16.5Ω/M′ 40.7Ω/km	.515	13.08	30	98	50	164
	9550 **NEC** CM PCC FT 4	50	100 500 1000	30.4 152.4 304.8	30.5 155.1 314.2	24 (7x32) 25Ω/M′ 78.7Ω/km	15.2Ω/M′ 31.2Ω/km	.700	17.78	30	98	50	164
								For color code information, request Technical Bulletin T/8-4.					

Product Description
Tinned copper, S-R PVC insulated, twisted pairs. Overall Beldfoil aluminum-polyester shield. 24 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

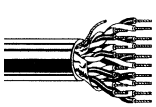
BELDEN

Paired
Overall Beldfoil® Shield

Sound, Broadcast, Audio, and Instrumentation Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Polyethylene Insulated**															
Product Description Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 24 AWG stranded tinned copper drain wire. Chrome PVC jacket. The Beldfoil shield combines high cable reliability with ease of termination. Color code: Black, Clear.															
 Beldfoil 100% Shield Coverage ℛ 2092 300V 60°C	**8641** **NEC** CM FT 1	1	100 U-500 500 U-1000 1000 2000	30.4 U-152.4 152.4 U-304.8 304.8 609.6	1.8 7.7 7.4 14.4 15.1 28.6	.016	.41	.025	.64	.168	4.27	22	72	42	138
						For Plenum versions, see 82641 or 88641 in Belden Master Catalog.									

Computer Cables
Low Capacitance Cables for EIA RS-232 Applications

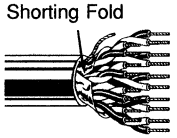
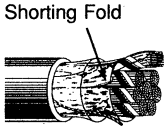
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Polyethylene Insulated**															
Product Description Tinned copper, polyethylene insulated, twisted pairs. Overall Beldfoil aluminum-polyester shield. 24 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code chart No. 5, Technical Information Section.															
 Beldfoil 100% Shield Coverage ℛ 2919 30V 80°C	**9680** **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	4.2 19.5 40.3	24 (7x32) 25Ω/M′ 78.7Ω/km	16Ω/M′ 47.6Ω/km	.298	7.57	100	66%	15.5	50.8	27.5	90.2
	9681 **NEC** CM PCC FT 1	4	100 500 1000	30.4 152.4 304.8	4.9 23.0 47.1	24 (7x32) 25Ω/M′ 78.7Ω/km	16Ω/M′ 47.6Ω/km	.325	8.26	100	66%	15.5	50.8	27.5	90.2
	9682 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	6.0 28.9 61.4	24 (7x32) 25Ω/M′ 78.7Ω/km	16Ω/M′ 45.3Ω/km	.362	9.19	100	66%	15.5	50.8	27.5	90.2
	9683 **NEC** CM PCC FT 1	9	100 500 1000	30.4 152.4 304.8	7.7 40.0 78.0	24 (7x32) 25Ω/M′ 78.7Ω/km	16Ω/M′ 41.7Ω/km	.395	10.03	100	66%	15.5	50.8	27.5	90.2
	9684 **NEC** CM PCC FT 1	12 ½ 12 pairs + 1 single	100 500 1000	30.4 152.4 304.8	11.2 54.9 106.9	24 (7x32) 24Ω/M′ 78.7Ω/km	14.5Ω/M′ 47.6Ω/km	.460	11.68	100	66%	15.5	50.8	27.5	90.2

* Capacitance between conductors.
** Capacitance between one conductor and other conductor connected to shield.

COOPER INDUSTRIES **BELDEN**

Paired
Overall Beldfoil® Shield

Sound, Broadcast, Instrumentation, and Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
22 Gage Solid Conductors **PVC Insulated**															
Shorting Fold  Beldfoil 100% Shield Coverage ℛ 2464 300V 80°C	**9302** **NEC** CM PCC FT 4	2	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.4 15.8 15.6 29.1 30.1	.013	.33	.032	.81	.244	6.20	35	115	50	164
	9305 **NEC** CM PCC FT 4	4	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	4.8 22.4 23.2 43.8 44.9	.013	.33	.032	.81	.265	6.73	35	115	45	164
	9306 **NEC** CM PCC FT 4	6	100 500 1000	30.4 152.4 304.8	6.9 32.6 60.5	.013	.33	.035	.89	.321	8.15	35	115	50	164
	9309 **NEC** CM PCC FT 4	9	100 500 1000	30.4 152.4 304.8	9.4 47.2 94.4	.013	.33	.037	.94	.373	9.47	35	115	50	164
	9315 **NEC** CM PCC FT 4	15	100 500 1000	30.4 152.4 304.8	14.7 71.8 140.6	.013	.33	.040	1.02	.455	11.56	35	115	50	164
	9319 **NEC** CM PCC FT 4	19	100 500 1000	30.4 152.4 304.8	17.6 87.6 172.2	.013	.33	.040	1.02	.495	12.57	35	115	50	164
	9327 **NEC** CM PCC FT 4	27	100 500 1000	30.4 152.4 304.8	24.3 123.9 240.8	.013	.33	.045	1.14	.615	15.62	35	115	50	164
Beldfoil 100% Shield Coverage 60°C	**8751** **NEC** CM PCC FT 4	51	250✉ 500✉ 1000✉ 1500✉	76.2 152.4 304.8 457.2	94.1 189.2 379.9 602.6	.010	.25	.050	1.27	.710	18.03	30	98	42.8	140
	Product Description: Tinned copper, PVC insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Chrome PVC jacket. Suggested working voltage: 300V RMS. For color-coding information, write for Technical Bulletin T/8-4. For 38 pair polypropylene version, see 8752 in Belden Master Catalog.														
Shorting Fold  Beldfoil 100% Shield Coverage 60°C	**9753** **NEC** CM PCC FT 4	102	250✉ 500✉ 1000✉ 1500✉	76.2 152.4 304.8 457.2	215.3 438.7 879.3 1380.0	.010	.25	.085	2.16	1.120	28.45	32	105	40	131
	Product Description: Tinned copper, PVC insulated, twisted pairs. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Chrome PVC jacket. Suggested working voltage: 300V RMS. For color-coding information, write for Technical Bulletin T/8-4.														

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.
✉ Spools are one piece, but length may vary –0 +20% from length shown.

[redacted]

COOPER INDUSTRIES BELDEN

Paired
Overall Beldfoil®℠℠Shield

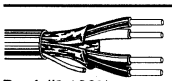
Sound, Broadcast, Instrumentation, and Computer Cables

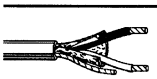
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
22 Gage Solid Conductors **Polypropylene Insulated**															
 Beldfoil 100% Shield Coverage 80°C	**8752** FT 1	38	250·: 500·: 1000·:	76.2 152.4 304.8	64.7 131.3 255.6	.008	.20	.045	1.14	.610	15.49	17	56	24.3	80
						Product Description: Tinned copper, polypropylene insulated, twisted pairs. Beldfoil aluminum-polyester shield, 22 AWG stranded tinned copper drain wire. Chrome PVC jacket. Suggested working voltage: 200V RMS. For color-coding information, write for Technical Bulletin T/8-4.								

Sound, Broadcast, Audio, and Instrumentation Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
22 Gage Solid Conductors **Polypropylene Insulated**															
 Beldfoil 100% Shield Coverage 105°C	**8450** FT 1	1	100 250 U-500 500 U-1000 1000	30.4 76.2 U-152.4 152.4 U-304.8 304.8	1.5 3.3 6.5 6.2 12.1 11.9	.006	.15	.018	.46	.118	3.00	40	131	76	249
						Product Description: Tinned copper, polypropylene insulated, twisted pair, Beldfoil aluminum-polyester shield, 22 AWG solid tinned copper drain wire, paper wrap, Gray or Black PVC jacket. 100% shield coverage. Belden's Miniature Type Broadcast Audio and Instrumentation Cables occupy 1/2 to 2/3 less space than standard cables. Suggested working voltage: 200V RMS. Color code: Black, Red.								

Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
22 Gage Solid Conductors **Datalene® Insulated**															
						Datalene insulation features are low dielectric constant and a dissipation factor for high-speed, low-distortion data handling. Physical properties include good crush resistance and light weight.										
 Duofoil® 100% Shield Coverage UL 2668 30V 60°C	**9184**℠℠ **NEC** CL2X PCC FT 1	2	500 1000	152.4 304.8	31.0 61.9	22 (Solid) tinned copper 16.5Ω/M′ 52.8Ω/km	Duofoil with stranded tinned copper drain wire 6.3Ω/M′ 20.7Ω/km	.385	9.78	150	78%	8.7	28.5	14.1	46.2
								Product Description: Tinned copper, Datalene insulated, twisted pairs, Duofoil aluminum-polyester shield, 22 AWG stranded tinned copper drain wire, Black PVC jacket. Color code: Black/Yellow, Red/Blue.								

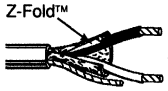
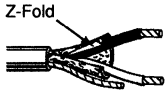
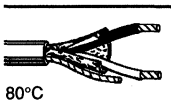
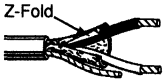
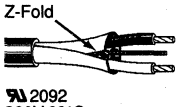
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
22 Gage Stranded Conductors (7x30) **S-R PVC Insulated**															
 Beldfoil 100% Shield Coverage UL 2464 300V 80°C	**9414** **NEC** CM PCC FT 4	1	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	2.3 10.5 10.2 19.7 20.4	.010	.25	.035	.89	.180	4.57	50	164	95	312
						Product Description: Tinned copper, S-R PVC insulated, twisted pair, Beldfoil aluminum-polyester shield, 22 AWG stranded tinned copper drain wire, pale Fawn Beige jacket-striated PVC. Color code: White, Black.										

℠℠ Duofoil shield on 9184.
* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.
·: Spools are one piece, but may vary –0 +20% from length shown.

Paired
Overall Beldfoil® Shield

BELDEN

Sound, Broadcast, Audio, and Instrumentation Cables

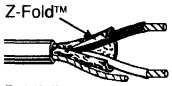
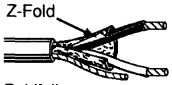
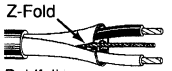
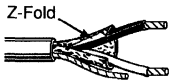
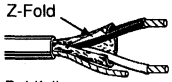
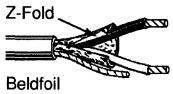
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
22 Gage Stranded Conductors (7x30)															
Z-Fold™  Beldfoil 100% Shield Coverage 2464 300V 80°C	**9462** **NEC** CM PCC FT 4	1	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	2.2 9.7 9.4 18.3 19.1	.013	.33	.031	.79	.178	4.52	50	164	90	295
						Product Description: Tinned copper, PVC insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code: Black, Red.								
Z-Fold Beldfoil 100%Shield Coverage 2092 300V 60°C	**8761** **NEC** CM PCC FT 1	1	U-500 500 U-1000 1000 2000 5000	U-152.4 152.4 U-304.8 304.8 609.6 1524.0	9.0 8.7 16.9 17.7 34.1 88.1	.016	.41	.025	.64	.175	4.45	24	79	47	154
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded copper drain wire. Chrome PVC jacket. 100% shield coverage. Color code: Black, Clear. **For Plenum versions, see 82761 or 88761 in Belden Master Catalog.**								
Z-Fold Beldfoil 100% Shield Coverage 2092 300V 60°C	**9461** **NEC** CM PCC FT 1	1	U-500 U-1000	U-152.4 U-304.8	8.8 16.2	.016	.41	.026	.66	.180	4.57	24	79	47	154
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Chrome PVC jacket. 100% shield coverage. The jacket and shield are bonded so both can be removed on automatic stripping equipment.								
Z-Fold  Beldfoil 100% Shield Coverage 60°C	**8451** **NEC** CM PCC FT 1	1	100 250 U-500 500 U-1000 1000	30.4 76.2 U-152.4 152.4 U-304.8 304.8	1.7 3.5 7.4 7.0 13.8 13.5	.008	.20	.020	.51	.135	3.43	34	111	67	220
						Product Description: Tinned copper, polypropylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Paper wrap, Gray or Black PVC jacket. 100% shield coverage. Belden's Miniature Type Broadcast Audio and Instrumentation Cables occupy 1/2 to 2/3 less space than standard cables. Suggested working voltage: 300V RMS. Color code: Black, Red.								
Z-Fold Beldfoil 100% Shield Coverage 60°C	**9451** **NEC** CM PCC FT 1	1	U-500 500 T-1000 U-1000	U-152.4 152.4 T-304.8 U-304.8	7.0 7.0 13.6 12.9	.008	.20	.020	.51	.135	3.43	34	111	67	220
						Product Description: Tinned copper, polypropylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Gray PVC jacket. The jacket and shield are bonded so both can be removed on automatic stripping equipment. Drain wire is on the inside of foil shield. Belden's Miniature Type Broadcast Audio and Instrumentation Cables occupy 1/2 to 2/3 less space than standard cables. Suggested working voltage: 300V RMS. Color code: Black, Red.								
20 Gage Stranded Conductors (7x28)															
 80°C	**9802**	1	500 1000	152.4 304.8	10.6 19.7	.013	.25	.035	.89	.190	4.83	25	82	46	150
						Product Description: Tinned copper, polyethylene insulated, conductors cabled. Beldfoil aluminum-polyester shield. 22 AWG solid tinned copper drain wire. Black high density polyethylene jacket. Suggested working voltage: 350V. Color code: White, Black.								
Z-Fold  2092 300V 60°C	**8762** **NEC** CM PCC FT 1	1	100 250 U-500 500 U-1000 1000 2000	30.4 76.2 U-152.4 152.4 U-304.8 304.8 609.6	2.6 6.3 12.4 12.0 23.4 24.6 49.8	.016	.41	.028	.71	.204	5.18	27	89	49	161
						Product Description: Tinned copper, polyethylene insulated, twisted pair. 100% Beldfoil aluminum-polyester shield. 20 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code: Black, Clear.								
Z-Fold  2092 300V 60°C	**9464** **NEC** CM PCC FT 1	1	U-500 U-1000	U-152.4 U-304.8	12.6 24.3	.016	.41	.030	.76	.204	5.18	27	89	49	161
						Product Description: Tinned copper, polyethylene insulated, twisted pair. 100% Beldfoil aluminum-polyester shield. 20 AWG stranded tinned copper drain wire. Chrome PVC jacket. The jacket and shield are bonded so both can be removed on automatic stripping equipment. Drain wire is on the inside of foil shield. Color code: Black, Clear.								

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

COOPER INDUSTRIES **BELDEN**

Paired
Overall Beldfoil® Shield

Sound, Broadcast, Audio, and Instrumentation Cables

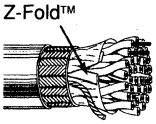
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Insulation Thickness Inch	Insulation Thickness mm	Jacket Thickness Inch	Jacket Thickness mm	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
20 Gage (cont'd.) Stranded Conductors (7x28)															
Z-Fold™  Beldfoil 100% Shield Coverage 2464 300V 80°C	**9154** **NEC** CM PCC FT 4	1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	11.9 11.6 22.8 23.6	.013	.33	.031	.79	.198	5.03	60	197	100	328
						Product Description: Tinned copper, PVC insulated, twisted pair. Beldfoil aluminum-polyester shield. 22 AWG stranded tinned copper drain wire. Beige PVC jacket. Color code: Black, Red.									
18 Gage Stranded Conductors (16x30)															
Z-Fold  Beldfoil 100% Shield Coverage 2092 300V 60°C	**8760** **NEC** CM PCC FT 1	1	250 U-500 500 U-1000 1000 2000 5000	76.2 U-152.4 152.4 U-304.8 304.8 609.6 1524.0	7.5 13.7 14.8 27.4 28.7 58.7 148.2	.018	.46	.028	.71	.222	5.64	24	79	44	144
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 20 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code: Black, Clear. **For Plenum versions, see 82760 or 88760 in Belden Master Catalog.**									
Z-Fold  Beldfoil 100% Shield Coverage 2092 300V 60°C	**9460** **NEC** CM PCC FT 1	1	U-500 U-1000	U-152.4 U-304.8	14.5 28.0	.018	.46	.026	.66	.222	5.64	27	89	49	161
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 20 AWG stranded tinned copper drain wire. Chrome PVC jacket. The jacket and shield are bonded so both can be removed on automatic stripping equipment. Drain wire is on the side of foil shield. Color code: Black, Clear.									
16 Gage Stranded Conductors (19x29)															
Z-Fold  Beldfoil 100% Shield Coverage 2106 600V 60°C	**8719** **NEC** CL2 FT 1	1	U-500 500 U-1000 1000 2000 5000	U-152.4 152.4 U-304.8 304.8 609.6 1524.0	24.1 25.0 47.2 51.2 104.3 247.8	.032	.81	.032	.81	.310	7.87	23	75	44	144
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 18 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code: Black, Clear.									
14 Gage Stranded Conductors (19x27)															
Z-Fold  Beldfoil 100% Shield Coverage 2106 600V 60°C	**8720** **NEC** CL2	1	U-500 500 1000 2000	U-152.4 152.4 304.8 609.6	32.5 33.4 70.5 137.9	.032	.81	.035	.89	.340	8.64	24	79	47	154
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 16 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code: Black, Clear.									
12 Gage Stranded Conductors (19x25)															
Z-Fold  Beldfoil 100% Shield Coverage 2106 600V 60°C	**8718** **NEC** CL2	1	U-500 500 1000 2000	U-152.4 152.4 304.8 609.6	48.4 52.4 102.8 206.8	.037	.94	.040	1.02	.400	10.16	25	82	49	161
						Product Description: Tinned copper, polyethylene insulated, twisted pair. Beldfoil aluminum-polyester shield. 14 AWG stranded tinned copper drain wire. Chrome PVC jacket. Color code: Black, Clear.									

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

Paired
Overall Foil/Braid Shield

BELDEN

Computer Cables
Low Capacitance Cables for EIA RS-422 Applications

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
28 Gage Stranded Conductors (7x36) **Polyethylene Insulated** Z-Fold™  Beldfoil 100% Shield Coverage 2960 30V 60°C	**9804** **NEC** CL2 FT 1	2	100 500 1000	30.4 152.4 304.8	2.7 13.0 27.8	28 (7x36) 64.9Ω/M' 212.9Ω/km	4.9Ω/M' 16.1Ω/km	.214	5.44	100	66%	15.5	50.8	27.5	90.2
	9805 **NEC** CL2 FT 1	3	100 500 1000	30.4 152.4 304.8	3.0 14.4 31.4	28 (7x36) 64.9Ω/M' 212.9Ω/km	5.27Ω/M' 17.3Ω/km	.222	5.64	100	66%	15.5	50.8	27.5	90.2
	9806 **NEC** CL2 FT 1	4	100 500 1000	30.4 152.4 304.8	3.4 16.5 36.0	28 (7x36) 64.9Ω/M' 212.9Ω/km	4.2Ω/M' 13.8Ω/km	.237	6.02	100	66%	15.5	50.8	27.5	90.2
	9807 **NEC** CL2 FT 1	5	100 500 1000	30.4 152.4 304.8	3.7 17.2 39.4	28 (7x36) 64.9Ω/M' 212.9Ω/km	4.4Ω/M' 14.4Ω/km	.240	6.10	100	66%	15.5	50.8	27.5	90.2
	9808 **NEC** CL2 FT 1	7	100 500 1000	30.4 152.4 304.8	4.1 19.2 44.1	28 (7x36) 64.9Ω/M' 212.9Ω/km	3.7Ω/M' 12.1Ω/km	.256	6.50	100	66%	15.5	50.8	27.5	90.2
	9809 **NEC** CL2 FT 1	9	100 500 1000	30.4 152.4 304.8	4.9 26.7 54.6	28 (7x36) 64.9Ω/M' 212.9Ω/km	3.5Ω/M' 11.5Ω/km	.290	7.37	100	66%	15.5	50.8	27.5	90.2
	9812 **NEC** CL2 FT 1	12	100 500 1000	30.4 152.4 304.8	5.6 30.8 65.1	28 (7x36) 64.9Ω/M' 212.9Ω/km	4.0Ω/M' 13.1Ω/km	.319	8.10	100	66%	15.5	50.8	27.5	90.2
	9813 **NEC** CL2 FT 1	13	100 500 1000	30.4 152.4 304.8	6.9 34.7 69.4	28 (7x36) 64.9Ω/M' 212.9Ω/km	2.83Ω/M' 9.3Ω/km	.336	8.53	100	66%	15.5	50.8	27.5	90.2
	9819 **NEC** CL2 FT 1	18	100 500 1000	30.4 152.4 304.8	8.3 41.5 83.1	28 (7x36) 64.9Ω/M' 212.9Ω/km	2.04Ω/M' 6.7Ω/km	.365	9.27	100	66%	15.5	50.8	27.5	90.2
	9825 **NEC** CL2 FT 1	25	100 500 1000	30.4 152.4 304.8	11.2 55.0 107.0	28 (7x36) 64.9Ω/M' 212.9Ω/km	1.62Ω/M' 5.3Ω/km	.429	10.90	100	66%	15.5	50.8	27.5	90.2
	9814 **NEC** CL2 FT 1	31	100 500 1000	30.4 152.4 304.8	13.1 55.0 107.0	28 (7x36) 64.9Ω/M' 212.9Ω/km	2.1Ω/M' 6.9Ω/km	.462	11.73	100	66%	15.5	50.8	27.5	90.2

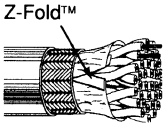
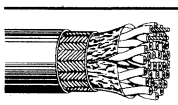
Product Description
Tinned copper, polyethylene insulated, twisted pairs. Overall Beldfoil® aluminum-polyester shield. 28AWG stranded tinned copper drain wire. Overall tinned copper braid shield (90% coverage). Chrome PVC jacket. Color code chart No. 3, Technical Information Section.

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

BELDEN

Paired
Overall Foil/Braid Shield

Computer Cables
For EIA RS-232 and CAD/CAM Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 KHz * pF/ft.	Nominal Capacitance @ 1 KHz * pF/m	Nominal Capacitance @ 1 KHz ** pF/ft.	Nominal Capacitance @ 1 KHz ** pF/m
24 Gage Stranded Conductors (7x32) **S-R PVC Insulated**													
Z-Fold™  Beldfoil 100% Shield Coverage 2464 300V 80°C Type T2	**8332** **NEC** CM PCC FT 4	2	100 500 1000	30.4 152.4 304.8	3.9 17.9 34.3	24 (7x32) 25.0Ω/M' 78.7Ω/km	5.4Ω/M' 17.7Ω/km	.250	6.35	30	98	50	164
	8333 **NEC** CM PCC FT 4	3	100 500 1000	30.4 152.4 304.8	4.4 20.6 41.7	24 (7x32) 24.0Ω/M' 78.7Ω/km	7.0Ω/M' 23.0Ω/km	.265	6.73	30	98	50	164
	8334 **NEC** CM PCC FT 4	4	100 500 1000	30.4 152.4 304.8	5.0 23.4 47.3	24 (7x32) 24.0Ω/M' 78.7Ω/km	4.5Ω/M' 14.8Ω/km	.288	7.32	30	98	50	164
	8335 **NEC** CM PCC FT 4	5	100 500 1000	30.4 152.4 304.8	5.6 26.5 54.3	24 (7x32) 24.0Ω/M' 78.7Ω/km	4.6Ω/M' 15.1Ω/km	.295	7.49	30	98	50	164
	8336 **NEC** CM PCC FT 4	6	100 500 1000	30.4 152.4 304.8	6.4 30.1 61.5	24 (7x32) 24.0Ω/M' 78.7Ω/km	4.7Ω/M' 15.4Ω/km	.310	7.87	30	98	50	164
	8337 **NEC** CM PCC FT 4	7	100 500 1000	30.4 152.4 304.8	6.8 32.3 65.9	24 (7x32) 24.0Ω/M' 78.7Ω/km	4.7Ω/M' 15.4Ω/km	.321	8.15	30	98	50	164
	8340 **NEC** CM PCC FT 4	10	100 500 1000	30.4 152.4 304.8	8.8 44.3 88.6	24 (7x32) 24.0Ω/M' 78.7Ω/km	3.5Ω/M' 11.5Ω/km	.385	9.78	30	98	50	164
	8342 **NEC** CM PCC FT 4	12½ 12 pairs + 1 single	100 500 1000	30.4 152.4 304.8	10.6 54.3 106.9	24 (7x32) 24.0Ω/M' 78.7Ω/km	3.6Ω/M' 11.8Ω/km	.405	10.29	30	98	50	164
	8345 **NEC** CM PCC FT 4	15	100 500 1000	30.4 152.4 304.8	13.3 63.3 128.7	24 (7x32) 24.0Ω/M' 78.7Ω/km	3.2Ω/M' 10.5Ω/km	.445	11.30	30	98	50	164
 Beldfoil 100% Shield Coverage 2464 300V 80°C	**8348** **NEC** CM PCC FT 4	18	100 500 1000	30.4 152.4 304.8	14.9 75.4 147.7	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.7Ω/M' 8.9Ω/km	.480	12.19	30	98	50	164
	8355 **NEC** CM PCC FT 4	25	100 500 1000	30.4 152.4 304.8	19.2 95.2 191.4	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.5Ω/M' 8.2Ω/km	.550	13.97	30	98	50	164

Product Description
Tinned copper, S-R PVC insulated multi-paired cable with overall Beldfoil® aluminum-polyester shield plus 65% tinned copper braid shield. Chrome PVC jacket. Color code chart No. 5, Technical Information Section.

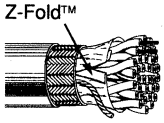
* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

[redacted]

Paired
Overall Foil/Braid Shield

BELDEN

Computer Cables
Low Capacitance Cables for EIA RS-422 Applications

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Polyethylene Insulated** Z-Fold™  Beldfoil 100% Shield Coverage UL 2919 30V 80°C	**9829** **NEC** CM PCC FT 1	2	100 500 1000	30.4 152.4 304.8	4.6 25.2 50.9	24 (7x32) 24.0Ω/M' 78.7Ω/km	3.71Ω/M' 12.17Ω/km	.304	7.72	85	66%	15.5	50.8	27.5	90
	9830 **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	5.9 27.8 56.9	24 (7x32) 24.0Ω/M' 78.7Ω/km	3.86Ω/M' 12.66Ω/km	.320	8.13	100	66%	15.5	50.8	27.5	90
	9831 **NEC** CM PCC FT 1	4	100 500 1000	30.4 152.4 304.8	6.8 32.8 68.0	24 (7x32) 24.0Ω/M' 78.7Ω/km	4.35Ω/M' 14.27Ω/km	.347	8.81	100	66%	15.5	50.8	27.5	90
	9832 **NEC** CM PCC FT 1	5	100 500 1000	30.4 152.4 304.8	7.2 34.7 73.0	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.6Ω/M' 8.53Ω/km	.365	9.27	100	66%	15.5	50.8	27.5	90
	9839 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	8.7 43.8 87.6	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.8Ω/M' 9.18Ω/km	.370	9.40	100	66%	15.5	50.8	27.5	90
	9833 **NEC** CM PCC FT 1	7	100 500 1000	30.4 152.4 304.8	9.0 45.4 90.2	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.8Ω/M' 9.18Ω/km	.394	10.01	100	66%	15.5	50.8	27.5	90
	9834 **NEC** CM PCC FT 1	9	100 500 1000	30.4 152.4 304.8	8.9 51.6 101.1	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.11Ω/M' 6.92Ω/km	.441	11.20	100	66%	15.5	50.8	27.5	90
	9835 **NEC** CM PCC FT 1	10	100 500 1000	30.4 152.4 304.8	11.7 55.9 113.9	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.25Ω/M' 7.38Ω/km	.480	12.19	100	66%	15.5	50.8	27.5	90
	9836 **NEC** CM PCC FT 1	12	100 500 1000	30.4 152.4 304.8	13.0 65.0 127.0	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.35Ω/M' 7.71Ω/km	.495	12.57	100	66%	15.5	50.8	27.5	90
	9837 **NEC** CM PCC FT 1	18	100 500 1000	30.4 152.4 304.8	18.4 91.0 183.0	24 (7x32) 24.0Ω/M' 78.7Ω/km	2.35Ω/M' 7.71Ω/km	.607	15.42	100	66%	15.5	50.8	27.5	90
	9838 **NEC** CM PCC FT 1	25	100 500 1000	30.4 152.4 304.8	25.3 118.3 229.6	24 (7x32) 24.0Ω/M' 78.7Ω/km	3.3Ω/M' 10.82Ω/km	.717	18.21	100	66%	15.5	50.8	27.5	90

Product Description
Tinned copper, polyethylene insulated, twisted pairs. Overall Beldfoil® aluminum-polyester shield. 24 AWG stranded tinned copper drain wire. Overall tinned copper braid shield (90% coverage). Chrome PVC jacket. Color code chart No. 5, Technical Information Section.

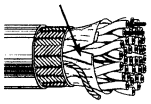
* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

Paired
Overall Foil/Braid Shield

Datalene® insulation features are low dielectric constant and a dissipation factor for high-speed, low-distortion data handling. Physical properties include good crush resistance and light weight.

COOPER INDUSTRIES **BELDEN**

Computer Cables
Low Capacitance Cables for EIA RS-232 and EIA-422 Applications

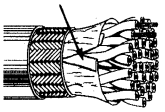
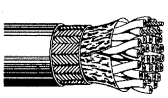
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Datalene® Insulated**															
Z-Fold™  Beldfoil 100% Shield Coverage 2919 30V 80°C	**8102** **NEC** CM PCC FT 1	2	100 500 1000	30.4 152.4 304.8	4.4 20.7 41.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.60Ω/M′ 15.1Ω/km	.290	7.37	100	78%	12.5	41	22	72.2
	8103 **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	5.0 23.5 48.2	24 (7x32) 24.0Ω/M′ 78.7Ω/km	3.80Ω/M′ 12.5Ω/km	.305	7.75	100	78%	12.5	41	22	72.2
	8104 **NEC** CM PCC FT 1	4	100 500 1000	30.4 152.4 304.8	5.7 27.2 57.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.06Ω/M′ 13.3Ω/km	.310	7.87	100	78%	12.5	41	22	72.2
	8105 **NEC** CM PCC FT 1	5	100 500 1000	30.4 152.4 304.8	6.1 28.9 61.4	24 (7x32) 24.0Ω/M′ 78.7Ω/km	4.22Ω/M′ 13.8Ω/km	.340	8.64	100	78%	12.5	41	22	72.2
	8106 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	7.0 35.2 70.3	24 (7x32) 24.0Ω/M′ 78.7Ω/km	3.54Ω/M′ 11.6Ω/km	.370	9.40	100	78%	12.5	41	22	72.2
	8107 **NEC** CM PCC FT 1	7	100 500 1000	30.4 152.4 304.8	7.2 36.3 72.6	24 (7x32) 24.0Ω/M′ 78.7Ω/km	3.54Ω/M′ 11.5Ω/km	.370	9.40	100	78%	12.5	41	22	72.2
	8108 **NEC** CM PCC FT 1	8	100 500 1000	30.4 152.4 304.8	9.1 43.3 84.6	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.70Ω/M′ 8.8Ω/km	.380	9.65	100	78%	12.5	41	22	72.2
	8110 **NEC** CM PCC FT 1	10	100 500 1000	30.4 152.4 304.8	10.8 53.5 103.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.40Ω/M′ 7.9Ω/km	.460	11.68	100	78%	12.5	41	22	72.2
	8112 **NEC** CM PCC FT 1	12½ 12 pr. + 1 single	100 500 1000	30.4 152.4 304.8	11.9 58.9 114.7	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.40Ω/M′ 7.9Ω/km	.465	11.81	100	78%	12.5	41	22	72.2
	8115 **NEC** CM PCC FT 1	15	100 500 1000	30.4 152.4 304.8	14.1 69.8 140.5	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.55Ω/M′ 8.4Ω/km	.540	13.72	100	78%	12.5	41	22	72.2
	8118 **NEC** CM PCC FT 1	18	100 500 1000	30.4 152.4 304.8	16.1 79.6 160.2	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.11Ω/M′ 6.9Ω/km	.570	14.48	100	78%	12.5	41	22	72.2
	8125 **NEC** CM PCC FT 1	25	100 500 1000	30.4 152.4 304.8	22.4 104.0 200.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	2.02Ω/M′ 6.6Ω/km	.650	16.51	100	78%	12.5	41	22	72.2

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

COOPER INDUSTRIES BELDEN

Paired
Overall Foil/Braid Shield

Computer Cables
For EIA RS-232 and CAD/CAM Applications

Description U.L. Style C.S.A. Type	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nominal Capacitance @ 1 Khz * pF/ft.	Nominal Capacitance @ 1 Khz * pF/m	Nominal Capacitance @ 1 Khz ** pF/ft.	Nominal Capacitance @ 1 Khz ** pF/m
22 Gage Stranded Conductors (7x30) **S-R PVC Insulated**													
Z-Fold™  Beldfoil 100% Shield Coverage AWM 2464 300V 80°C CSA Type T2	**8302** **NEC** CM PCC FT 4	2	100 500 1000	30.4 152.4 304.8	4.4 20.3 41.2	22 (7x30) 15.0Ω/M' 49.2Ω/km	5.7Ω/M' 18.7Ω/km	.260	6.60	40	131	72	236
	8303 **NEC** CM PCC FT 4	3	100 500 1000	30.4 152.4 304.8	5.4 25.7 52.7	22 (7x30) 15.0Ω/M' 49.2Ω/km	6.2Ω/M' 20.3Ω/km	.296	7.52	35	115	63	207
	8304 **NEC** CM PCC FT 4	4	100 500 1000	30.4 152.4 304.8	6.5 30.4 65.2	22 (7x30) 15.0Ω/M' 49.2Ω/km	4.9Ω/M' 16.1Ω/km	.320	8.13	35	115	63	207
	8305 **NEC** CM PCC FT 4	5	100 500 1000	30.4 152.4 304.8	7.0 33.5 70.7	22 (7x30) 15.0Ω/M' 49.2Ω/km	4.8Ω/M' 15.7Ω/km	.322	8.18	35	115	63	207
	8306 **NEC** CM PCC FT 4	6	100 500 1000	30.4 152.4 304.8	7.9 38.0 76.6	22 (7x30) 15.0Ω/M' 49.2Ω/km	5.0Ω/M' 16.4Ω/km	.348	8.84	35	115	63	207
	8307 **NEC** CM PCC FT 4	7	100 500 1000	30.4 152.4 304.8	8.4 40.6 84.7	22 (7x30) 15.0Ω/M' 49.2Ω/km	5.0Ω/M' 16.4Ω/km	.348	8.84	35	115	63	207
	8308 **NEC** CM PCC FT 4	8	100 500 1000	30.4 152.4 304.8	9.9 50.0 100.0	22 (7x30) 15.0Ω/M' 49.2Ω/km	4.4Ω/M' 14.4Ω/M'	.384	9.75	35	115	63	207
 Beldfoil 100% Shield Coverage AWM 2464 300V 80°C CSA Type T2	**8310** **NEC** CM PCC FT 4	10	100 500 1000	30.4 152.4 304.8	12.1 61.2 124.4	22 (7x30) 15.0Ω/M' 49.2Ω/km	4.1Ω/M' 13.4Ω/km	.440	11.18	35	115	63	207
	8312 **NEC** CM PCC FT 4	12½ 12 pr. + 1 single	100 500 1000	30.4 152.4 304.8	13.6 71.2 139.5	22 (7x30) 15.0Ω/M' 49.2Ω/km	4.2Ω/M' 13.8Ω/km	.455	11.56	35	115	63	207
	8315 **NEC** CM PCC FT 4	15	100 500 1000	30.4 152.4 304.8	16.2 79.9 156.8	22 (7x30) 15.0Ω/M' 49.2Ω/km	3.8Ω/M' 12.5Ω/km	.502	12.75	35	115	63	207
	8318 **NEC** CM PCC FT 4	18	100 500 1000	30.4 152.4 304.8	19.2 95.3 191.6	22 (7x30) 15.0Ω/M' 49.2Ω/km	3.0Ω/M' 9.8Ω/km	.535	13.59	35	115	63	207
	8325 **NEC** CM PCC FT 4	25	100 500 1000	30.4 152.4 304.8	23.5 120.8 234.6	22 (7x30) 14.0Ω/M' 49.2Ω/km	2.9Ω/M' 9.5Ω/km	.620	15.75	35	115	63	207

Product Description

Tinned copper, S-R PVC insulated, twisted pairs. Overall Beldfoil® aluminum-polyester shield plus 65% tinned copper braid shield. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.

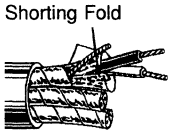
* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

[redacted]

Paired
Individually Shielded

BELDEN

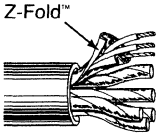
Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
25 Gage Stranded Condutors (7x33) **Polyethylene Insulated** Shorting Fold  2094 300V 60°C	**9863**	3	100 500 1000	30.4 152.4 304.8	8.5 39.4 80.8	25 (7x33) .021 31.8Ω/M′ 104.3Ω/km	Beldfoil w/ stranded tinned copper drain wire over each pair 12Ω/M′ 39.4Ω/km 100% shield coverage	.430	10.92	124	66%	12.2	40.0	22.3	73.2

Product Description
Tinned copper, polyethylene insulated, twisted pairs. Each pair individually shielded with Beldfoil® aluminum-polyester shield and 22 AWG stranded tinned copper drain wire. Individual mylar wrap over each shielded pair, overall PVC jacket. Individual pairs color coded: Clear, Blue. Shields color coded: Blue, Red, Green.

24 Gage
Stranded Conductors (7x32)
Polyethylene Insulated

Product Description
Tinned copper, polyethylene insulated, twisted pairs. Each pair individually shielded with Beldfoil aluminum-polyester shield and 24 AWG stranded tinned copper drain wire. Overall chrome PVC jacket. Color code chart No. 3, Technical Information Section.

Z-Fold™  Beldfoil 100% Shield Coverage 2919 300V 80°C	**9990** **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	4.6 21.3 43.3	24 (7x32) 24.0Ω/M′ 78.7Ω/km	18.0Ω/M′ 59.1Ω/km	.248	6.30	60	66%	25	82	47	154
	9991 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	7.5 35.9 74.9	24 (7x32) 24.0Ω/M′ 78.7Ω/km	18.0Ω/M′ 59.1Ω/km	.328	8.33	60	66%	25	82	47	154
	9992 **NEC** CM PCC FT 1	9	100 500 1000	30.4 152.4 304.8	10.0 50.2 100.4	24 (7x32) 24.0Ω/M′ 78.7Ω/km	18.0Ω/M′ 59.1Ω/M′	.368	9.35	60	66%	25	82	47	154
	9993 **NEC** CM PCC FT 1	12	100 500 1000	30.4 152.4 304.8	13.2 62.8 123.7	24 (7x32) 24.0Ω/M′ 78.7Ω/km	18.0Ω/M′ 59.1Ω/km	.426	10.82	60	66%	25	82	47	154
	9995 **NEC** CM PCC FT 1	25	100 500 1000	30.4 152.4 304.8	25.0 128.2 249.4	24 (7x32) 24.0Ω/M′ 78.7Ω/km	18.0Ω/M′ 59.1Ω/km	.636	16.15	60	66%	25	82	47	154

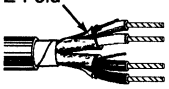
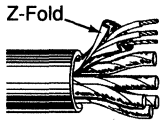
* Capacitance between conductors.
** Capacitance between one conductor and and other conductors connected to shield.

Paired
Individually Shielded

Datalene® insulation features are low dielectric constant and a dissipation factor for high-speed, low-distortion data handling. Physical properties include good crush resistance and light weight.

COOPER INDUSTRIES **BELDEN**

Computer Cables For EIA RS-422 Applications

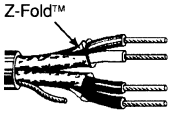
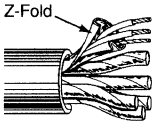
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Datalene® Insulated**															
Z-Fold™  Beldfoil 100% Shield Coverage UL 2493 60°C	**9729** **NEC** CM PCC FT 1	2	100 500 1000	30.4 152.4 304.8	4.6 21.6 46.9	24 (7x32) 25.0Ω/M' 78.7Ω/km	Beldfoil w/ 24 AWG stranded tinned copper drain wire 18.0Ω/M' 59.1Ω/km	.335	8.51	100	78%	12.5	41.0	23.2	76.1
								For Plenum versions, see 82729 or 89729 in Belden Master Catalog.							
	9730 **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	5.3 25.1 54.3	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.345	8.76	100	78%	12.5	41.0	23.2	76.1
								For Plenum version, see 89730 in Belden Master Catalog.							
	9728 **NEC** CM PCC FT 1	4	100 500 1000	30.4 152.4 304.8	8.5 33.6 67.3	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.404	10.26	100	78%	12.5	41.0	23.2	76.1
								For Plenum version, see 89728 in Belden Master Catalog.							
	9731 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	10.0 48.9 96.5	24 (7x32) 24Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.476	12.09	100	78%	12.5	41.0	23.2	76.1
	9732 **NEC** CM PCC FT 1	9	100 500 1000	30.4 152.4 304.8	14.0 70.7 142.4	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.570	14.48	100	78%	12.5	41.0	23.2	76.1
	9733 **NEC** CM PCC FT 1	11	100 500 1000	30.4 152.4 304.8	17.9 81.5 156.0	24.0 (7x32) 24Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.610	15.49	100	78%	12.5	41.0	23.2	76.1
Z-Fold  Beldfoil 100% Shield Coverage UL 2493 60°C	**9734** **NEC** CM PCC FT 1	12	100 500 1000	30.4 152.4 304.8	17.5 86.9 166.9	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.630	16.00	100	78%	12.5	41.0	23.2	76.1
	9735 **NEC** CM PCC FT 1	15	100 500 1000	30.4 152.4 304.8	22.1 102.6 209.2	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.700	17.78	100	78%	12.5	41.0	23.2	76.1
	9736 **NEC** CM PCC FT 1	17	100 500 1000	30.4 152.4 304.8	23.8 111.7 226.4	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.730	18.54	100	78%	12.5	41.0	23.2	76.1
	9737 **NEC** CM PCC FT 1	19	100 500 1000	30.4 152.4 304.8	25.1 118.0 240.0	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.750	19.05	100	78%	12.5	41.0	23.2	76.1
	9738 **NEC** CM PCC FT 1	27	100 500 1000	30.4 152.4 304.8	36.5 173.2 354.5	24 (7x32) 24.0Ω/M' 78.7Ω/km	18.0Ω/M' 59.1Ω/km	.875	22.23	100	78%	12.5	41.0	23.2	76.1

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

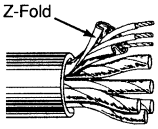
COOPER INDUSTRIES **BELDEN**

Paired
Individually Shielded

Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
22 Gage Stranded Conductors (7x30) **Polypropylene Insulated**															
Z-Fold™  Beldfoil 100% Shield Coverage 60°C	**8723** **NEC** CM PCC FT 1	2	100 U-500 500 U-1000 1000 5000 1640 2000 U2000 3280	30.4 U-152.4 152.4 U-304.8 304.8 1524.0 499.9 609.6 U609.6 999.7	2.3 10.0 10.8 21.6 21.6 107.8 31.8 40.6 40.6 63.6	22 (7x30) 15.0Ω/M' 49.2Ω/km	16.6Ω/M'	.165	4.19	45	66%	35	115	62	203
						Product Description: Tinned copper, polypropylene insulated. Black and Red under a Beldfoil® aluminum-polyester shield, green and white under a Beldfoil aluminum-polyester shield. 24 AWG stranded tinned common drain wire. Chrome PVC jacket. Pairs cabled on common axis to reduce diameter. Color code: Red, Black, Green, White. Suggested working voltage: 300V RMS. Ø **For Plenum versions, see 82723 or 88723 in Belden Master Catalog.**										
Z-Fold  AWM 2919 30V 80°C	**8777** **NEC** CM PCC FT 1	3	100 U-250 250 U-500 500 1000 5000 1640 3280	30.4 U-76.2 76.2 U-152.4 152.4 304.8 1524.0 499.9 999.7	4.7 12.9 13.5 25.0 25.9 53.1 268.5 65.7 131.4	15 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.273	6.93	50	66%	30	98	55	180
						Product Description: Tinned copper, polypropylene insulated, twisted pairs. Each pair individually shielded with 100% Beldfoil® aluminum-polyester shield and 22 AWG stranded tinned copper drain wire. Overall chrome PVC jacket. Color code chart No. 3, Technical Information Section. **For Plenum versions, see 82777 or 88777 in Belden Master Catalog.**										

Product Description
Tinned copper, polyethylene insulated, twisted pairs. Each pair individually shielded with Beldfoil aluminum-polyester shield and 22 AWG stranded tinned copper drain wire. Overall chrome PVC jacket. Color code chart No. 3, Technical Information Section.

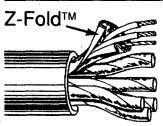
Z-Fold  Beldfoil 100% Shield Coverage AWM 2919 30V 80°C	**8778** **NEC** CM PCC FT 1	6	100 250 500 1000	30.4 76.2 152.4 304.8	3.9 23.6 48.0 93.9	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.362	9.19	50	66%	30	98	55	180
								For Plenum versions, see 82778 or 88778 in Belden Master Catalog.							
	8774 **NEC** CM PCC FT 1	9	100 250 500 1000	30.4 76.2 152.4 304.8	13.4 30.6 65.1 128.2	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.413	10.49	50	66%	30	98	55	180
	8775 **NEC** CM PCC FT 1	11	100 250 500 1000	30.4 76.2 152.4 304.8	14.9 35.4 74.2 144.3	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.458	11.63	50	66%	30	98	55	180
	9768 **NEC** CM PCC FT 1	12	100 250 500 1000	30.4 76.2 152.4 304.8	15.7 33.2 77.8 152.7	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.475	12.07	50	66%	30	98	55	180
	8776 **NEC** CM PCC FT 1	15	100 250 500 1000	30.4 76.2 152.4 304.8	20.9 52.2 102.4 205.8	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.565	14.35	50	66%	30	98	55	180
	9769 **NEC** CM PCC FT 1	17	100 250 500 1000	30.4 76.2 152.4 304.8	25.0 58.0 118.0 228.8	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.595	15.11	50	66%	30	98	55	180
	8769 **NEC** CM PCC FT 1	19	100 250 500 1000	30.4 76.2 152.4 304.8	26.7 61.9 127.2 247.4	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.595	15.11	50	66%	30	98	55	180
	8773 **NEC** CM PCC FT 1	27	100 250✉ 500✉ 1000✉	30.4 76.2 152.4 304.8	35.8 87.2 175.5 344.9	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.709	18.01	50	66%	30	98	55	180
	9767 **NEC** CM PCC FT 1	37	100 250✉ 500✉ 1000✉	30.4 76.2 152.4 304.8	48.2 112.4 228.8 496.0	22 (7x30) 16Ω/M' 49.2Ω/km	14.0Ω/M' 37.1Ω/km	.840	21.34	50	66%	30	98	55	180

* Capacitance between conductors. **Capacitance between one conductor and other conductors connected to shield.
✉ Spools are one piece, but length may vary −0 +20% from length shown. Ø For further information, request Technical Bulletin T/8-21.

BELDEN

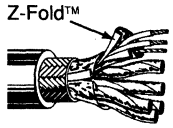
Paired
Individually Shielded

Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
18 Gage Stranded Conductors (16x30) **Polyethylene Insulated** Z-Fold™  Beldfoil 100% Shield Coverage AWM 2919 300V 80°C	**9773** **NEC** CM FT 1	3	100 500 1000	30.4 152.4 304.8	9.4 48.2 94.3	18 (16x30) 6.4Ω/M' 21Ω/km	8.3Ω/M' 27.2Ω/km	.370	9.40	50	66%	30	98	55	180
	9774 **NEC** CM FT 1	6	100 500 1000	30.4 152.4 304.8	19.3 95.6 192.5	18 (16x30) 6.4Ω/M' 21Ω/km	8.3Ω/M' 27.2Ω/km	.559	14.20	50	66%	30	98	55	180
	9775 **NEC** CM FT 1	9	100 500 1000	30.4 152.4 304.8	25.7 131.8 256.6	18 (16x30) 6.4Ω/M' 21Ω/km	8.3Ω/M' 27.2Ω/km	.629	15.98	50	66%	30	98	55	180
	9776 **NEC** CM FT 1	12	100 500 1000	30.4 152.4 304.8	32.4 206.4 420.8	18 (16x30) 6.4Ω/M' 21Ω/km	8.3Ω/M' 27.2Ω/km	.714	18.14	50	66%	30	98	55	180
	9777 **NEC** CM FT 1	15	100 500 1000	30.4 152.4 304.8	41.8 206.4 420.8	18 (16x30) 6.4Ω/M' 21Ω/km	8.3Ω/M' 27.2Ω/km	.784	19.91	50	66%	30	98	55	180

Product Description
Tinned copper, polyethylene insulated, twisted pairs. Each pair individually shielded with Beldfoil® aluminum-polyester shield and 20 AWG stranded tinned copper drain wire. Overall chrome PVC jacket. Color code chart No. 3, Technical Information Section.

Computer Cables
For EIA RS-422 and CAD/CAM Applications

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
24 Gage Stranded Conductors (7x32) **Datalene Insulated** Z-Fold™  Beldfoil 100% Shield Coverage AWM 2493 60°C	**8162**† **NEC** CM PCC FT 1	2	100 500 1000	30.4 152.4 304.8	6.5 33.0 65.5	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 4.3Ω/M' 14.1Ω/km	.351	8.92	100	78%	12.5	41	22	72.2
	8163† **NEC** CM PCC FT 1	3	100 500 1000	30.4 152.4 304.8	7.3 37.9 73.9	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 4.4Ω/M' 14.4Ω/km	.367	9.32	100	78%	12.5	41	22	72.2

Product Description
Tinned copper, Datalene insulated, twisted pairs. Each pair individually shielded with Beldfoil® aluminum-polyester shield and 24 AWG stranded tinned copper drain wire. Overall Beldfoil aluminum-polyester shield plus 65% tinned copper braid shield. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.
† Passes VW-1 Vertical Wire Flame Test.

Paired
Individually Shielded Pairs with Overall Foil/Braid Shield

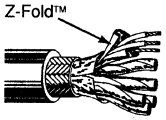
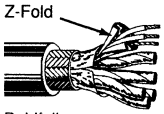
Datalene® insulation features are low dielectric constant and a dissipation factor for high-speed, low-distortion data handling. Physical properties include good crush resistance and light weight.

COOPER INDUSTRIES **BELDEN**

Computer Cables For EIA RS-422 and CAD/CAM Applications

24 Gage (cont'd.)
Stranded Conductors (7x32)
Datalene Insulated

Product Description
Tinned copper, Datalene insulated, twisted pairs. Each pair individually shielded with Beldfoil® aluminum-polyester shield and 24 AWG stranded tinned copper drain wire. Overall Beldfoil aluminum-polyester shield plus 65% tinned copper braid shield. Chrome PVC jacket. Color code chart No. 3, Technical Information Section.

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
Z-Fold™  Beldfoil 100% Shield Coverage 2493 60°C	**8164** **NEC** CM PCC FT 1	4	100 500 1000	30.4 152.4 304.8	9.5 44.3 90.6	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 3.2Ω/M' 10.5Ω/km	.397	10.08	100	78%	12.5	41	22	72.2
	8165 **NEC** CM PCC FT 1	5	100 500 1000	30.4 152.4 304.8	10.4 51.3 99.6	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 3.4Ω/M' 11.2Ω/km	.430	10.92	100	78%	12.5	41	22	72.2
	8166 **NEC** CM PCC FT 1	6	100 500 1000	30.4 152.4 304.8	11.5 57.0 110.4	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 2.8Ω/M' 9.2Ω/km	.464	11.79	100	78%	12.5	41	22	72.2
	8167 **NEC** CM PCC FT 1	7	100 500 1000	30.4 152.4 304.8	11.9 58.8 114.6	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 2.8Ω/M' 9.2Ω/km	.464	11.79	100	78%	12.5	41	22	72.2
	8168 **NEC** CM PCC FT 1	8	100 500 1000	30.4 152.4 304.8	15.0 74.3 149.6	24 (7x32) 24ΩM' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 3.0Ω/M' 9.8Ω/km	.562	14.27	100	78%	12.5	41	22	72.2
	8170 **NEC** CM PCC FT 1	10	100 500 1000	30.4 152.4 304.8	20.3 93.2 179.5	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 2.7Ω/M' 8.9Ω/km	.632	16.05	100	78%	12.5	41	22	72.2
	8175 **NEC** CM PCC FT 1	15	100 500 1000	30.4 152.4 304.8	24.6 115.2 234.4	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 2.5Ω/M' 8.2Ω/km	.690	17.53	100	78%	12.5	41	22	72.2
	8178 **NEC** CM PCC FT 1	18	100 500 1000	30.4 152.4 304.8	27.4 134.3 262.7	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 2.6Ω/M' 8.5Ω/km	.727	18.47	100	78%	12.5	41	22	72.2
Z-Fold  Beldfoil 100% Shield Coverage 2490 60°C	**8185** **NEC** CM PCC FT 1	25	100 500 1000	30.4 152.4 304.8	39.1 187.5 427.0	24 (7x32) 24Ω/M' 78.7Ω/km	Individual 18Ω/M' 59.1Ω/km Overall 2.4Ω/M' 7.9Ω/km	.902	22.91	100	78%	12.5	41	22	72.2

* Capacitance between conductors.
** Capacitance between one conductor and other conductors connected to shield.

Coaxial

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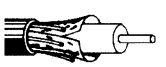
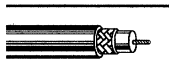
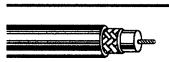
MATV Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
1354 30V 60°C **RG-6/U Type**	**9248†** **NEC** CL2 CXC FT 1	U-500 500 U-1000 1000 1640 3280	U-152.4 152.4 U-304.8 304.8 500 1000	15.8 16.4 30.3 33.3 49.0 98.1	18 (solid) .037 bare copper 7.5Ω/M′ 24.6Ω/km	Cellular Poly-ethylene .180	Cellular Poly-ethylene 4.57	.275	6.99	Duofoil® +61% tinned copper braid 5.0Ω/M′ 16.4Ω/km 100% shield coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.3 .7 1.5 2.1 3.8 4.4 6.0 6.9 7.3	1.0 2.3 4.9 6.9 12.5 14.4 19.7 22.6 23.9
											PVC jacket. 100% Sweep Tested. 5–450 MHz.						
80°C **RG-6/U Type**	**9114** Replaces 9283 **NEC** CATV CXC FT 1	U-500¶ Black Lt. Bge. 1000 Black U-1000 Black Lt. Bge.	U-152.4 304.8 U-304.8	13.1 29.2 25.2	18 (solid) .037 bare copper covered steel 45.5Ω/M′ 149.2Ω/km	Cellular Poly-ethylene .180	Cellular Poly-ethylene 4.57	.290	7.37	Duobond® II +37% aluminum braid 24.7Ω/M′ 81.0Ω/km 100% shield coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.5 .9 1.5 2.1 3.1 4.4 6.0 6.9 7.3	1.6 3.0 4.9 6.9 10.2 14.4 19.7 22.6 23.9
											Black PVC jacket. 100% Sweep Tested. 5–550 MHz.						
 60°C **RG-6/U Type**	**8228**[P] CXC	100 Black U-500 Black 500 White Black U-1000 Black 1000 White Black	30.5 U-152.4 152.4 U-304.8 304.8	2.7 12.7 13.4 24.4 25.1	18 (solid) .037 bare copper 7.5Ω/M′ 24.6Ω/km	Cellular Poly-ethylene .180	Cellular Poly-ethylene 4.57	.242	6.15	Duofoil + drain 19.5Ω/M′ 64.0Ω/km 100% shield coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.3 .7 1.5 2.1 3.1 4.4 6.0 6.9 7.3	1.0 2.3 4.9 6.9 10.2 14.4 19.7 22.6 23.9
											PVC jacket. 100% Sweep Tested. 5–300 MHz.						

Broadcast Cables

 1354 60°C **RG-8/U Type**	**8214** **NEC** CL2 CXC FT 1	50 100 400 500 1000	15.2 30.5 121.9 152.4 304.8	5.8 10.7 44.0 55.0 107.9	11 (7x19) .108 bare copper 1.2Ω/M′ 3.9Ω/km	Cellular Poly-ethylene .285	Cellular Poly-ethylene 7.24	.405	10.29	Bare copper 1.1Ω/M′ 3.6Ω/km 97% shield coverage	50	78%	26	85.3	1 10 50 100 200 400 700 900 1000 4000	.14 .5 1.2 1.8 2.7 4.2 5.8 6.7 7.1 18.0	.5 1.6 3.9 5.9 8.9 13.8 19.0 22.0 23.3 59.0
											Black PVC jacket.						
 1354 60°C **RG-8/X Type**	**9258** **NEC** CL2 CXC FT 1	100 500 U-500 1000 U-1000	30.5 152.4 U-152.4 304.8 U-304.8	4.1 19.0 18.2 36.4 35.5	16 (19x29) .056 bare copper 4.3Ω/M′ 14.1Ω/km	Cellular Poly-ethylene .155	Cellular Poly-ethylene 3.94	.242	6.15	Bare copper 3.3Ω/M′ 10.8Ω/km 95% shield coverage	50	78%	26	85.3	1 10 50 100 200 400 700 900 1000	.5 1.0 2.5 3.7 5.4 8.0 11.1 12.8 13.5	1.6 3.3 8.2 12.1 17.7 26.2 36.4 42.0 44.3
											Black or White PVC jacket.						
80°C **RG-11/U JAN-C-17A**	**8238** **NEC** CL2 CXC FT 1	100 500 1000	30.5 152.4 304.8	9.9 50.6 99.2	18 (7x26) .048 tinned copper 6.1Ω/M′ 20.0Ω/km	Poly-ethylene .285	Poly-ethylene 7.24	.405	10.29	Bare copper 1.2Ω/M′ 3.9Ω/km 97% shield coverage	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	.19 .66 1.3 2.0 2.9 4.2 5.8 6.8 7.1	.6 2.2 4.3 6.6 9.5 13.8 19.0 22.3 23.3
											Black PVC jacket.						

¶ Spools are one piece, but length may vary ±10% from length shown.
† Passes VW-1 Vertical Wire Flame Test.
[P] Belden U.S. Patent #3,927,247 Canadian Patent #875,188.
Request quotations of RG/U cables not listed.

Coaxial

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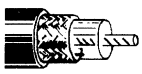
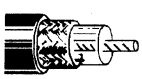
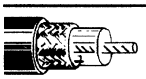
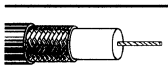
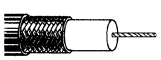
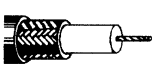
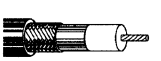
Broadcast Cables

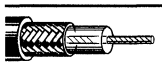
Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
 80°C **RG-11 A/U MIL-C-17D**	**8261**† CXC	500 1000	152.4 304.8	48.7 95.3	18 (7x26) .048 tinned copper 6.06Ω/M′ 19.9Ω/km	Poly-ethylene .285	7.24	.405	10.29	Bare copper 1.24Ω/M′ 4.1Ω/km 97% shield coverage	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	.19 .66 1.3 2.0 2.9 4.2 5.8 6.8 7.1	.6 2.2 4.3 6.6 9.5 13.8 19.0 22.3 23.3
											Black PVC jacket.						
 1354 80°C **RG-8-A/U MIL-C-17D**	**9251** **NEC** CL2X CXC	100 400 500 1000	30.5 121.9 152.4 304.8	10.9 44.4 55.6 109.1	13 (7x21) .085 copper 1.9Ω/M′ 6.2Ω/km	Poly-ethylene .285	7.24	.405	10.29	Bare copper 1.2Ω/M′ 3.9Ω/km 97% shield coverage	52	66%	29.5	96.8	1 10 50 100 200 400 700 900 1000 4000	.17 .55 1.3 1.9 2.7 4.1 6.5 7.6 8.0 21.5	.6 1.8 4.3 6.2 8.9 13.4 21.3 24.9 26.2 70.5
											Black non-contaminating PVC jacket.						
 80°C **MIL-C-17F M17/6-RG11 QPL**	**9212**† CXC FT 1	100 500 1000	30.5 152.4 304.8	9.5 48.7 95.3	18 (7x26) .048 tinned copper 6.06Ω/M′ 19.9Ω/km	Poly-ethylene .285	7.24	.405	10.29	Bare copper 1.24Ω/M′ 4.1Ω/km 97% shield coverage	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	.19 .66 1.3 2.0 2.9 4.2 5.8 6.8 7.1	.6 2.2 4.3 6.6 9.5 13.8 19.0 22.3 23.3
											Black non-contaminating PVC jacket.						
 80°C **I.E.C.Q.◨ MIL-C-17F M17/28-RG058**	**9203** CXC	U500 500 U-1000	U152.4 152.4 U304.8	13.3 14.0 25.5	20 (19x33) .035 tinned copper 10.8Ω/M′ 35.4Ω/km	Poly-ethylene .116	2.95	.195	4.95	Tinned copper 4.1Ω/M′ 13.5Ω/km 96% shield coverage	50	66%	30.8	101.0	1 10 50 100 200 400 700 900 1000	.44 1.4 3.3 4.9 7.3 11.5 17.0 20.0 21.5	1.4 4.6 10.8 16.1 23.9 37.7 55.8 65.6 70.5
											Black non-contaminating PVC jacket.						
 60°C **RG-58A/U JAN-C-17A**	**8259** CXC	25 50 100 U-500 500 U-1000 1000	7.6 15.2 30.5 U-152.4 152.4 U-304.8 304.8	1.0 1.7 2.9 13.0 13.6 24.9 26.0	20 (19x33) .035 tinned copper 10.8Ω/M′ 35.4Ω/km	Poly-ethylene .116	2.95	.193	4.9	Tinned copper 4.1Ω/M′ 13.5Ω/km 96% shield coverage	50	66%	30.8	101.0	1 10 50 100 200 400 700 900 1000	.44 1.4 3.3 4.9 7.3 11.5 17.0 20.0 21.5	1.4 4.6 10.8 16.1 23.9 37.7 55.8 65.6 70.5
											Black PVC jacket.						
 1354 60°C **RG-58A/U Type**	**8219** **NEC** CL2 CXC FT 1	100 U-500 500 U-1000 1000	30.5 U-152.4 152.4 U-304.8 304.8	2.7 12.5 12.9 23.6 24.4	20 (19x32) .037 tinned copper 8.8Ω/M′ 28.9Ω/km	Cellular Poly-ethylene .114	2.90	.198	5.0	Tinned copper 4.1Ω/M′ 13.5Ω/km 96% shield coverage	50	78%	26.0	85.3	1 10 50 100 200 400 700 900 1000	.36 1.4 3.2 4.5 6.4 9.0 12.0 13.8 14.5	1.2 4.6 10.5 14.8 21.0 29.5 39.4 45.3 47.6
											Black or White PVC jacket.						
 1354 60°C **RG-58A/U Type**	**9311**⊕ **NEC** CL2 CXC FT 1	100 U-500 500 U-1000 1000	30.5 U-152.4 152.4 U-304.8 304.8	2.2 10.7 11.3 20.4 21.0	20 (19x32) .037 tinned copper 8.8Ω/M′ 28.9Ω/km	Cellular Poly-ethylene .114	2.90	.193	4.9	Duobond® II +56% tinned copper braid 17.0Ω/M′ 55.8Ω/km	50	78%	26.0	85.3	1 10 50 100 200 400 700 900 1000	.36 1.3 2.8 4.0 5.7 8.2 11.0 12.5 13.0	1.2 4.3 9.2 13.1 18.7 26.9 36.1 41.0 42.6
											Black PVC jacket.						

† Passes VW-1 Vertical Wire Flame Test.
⊕ Request Technical Bulletin T/8-34 for connector information.
◨ I.E.C.Q. is an international certification—the only worldwide (International Electronics Commission) certification for electronic components. Products with the I.E.C.Q. designation may be used confidently by buyers throughout the world without need for further domestic testing.
Request quotations of RG/U cables not listed.

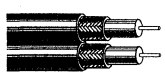
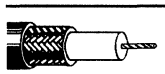
Coaxial

BELDEN

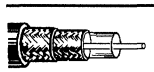
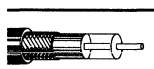
Broadcast Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
 80°C **MIL-C-17F M17/155-00001 (RG-58 C/U▾▾) QPL**	**8262** CXC	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	13.3 12.6 25.5 26.3	20 (19x33) .035 tinned copper 10.8Ω/M′ 35.4Ω/km	Poly-ethylene .116	2.95	.195	4.95	Tinned copper 4.1Ω/M′ 13.5Ω/km 96% shield coverage	50	66%	30.8	101.0	1 10 50 100 200 400 700 900 1000	.44 1.4 3.3 4.9 7.3 11.5 17.0 20.0 21.5	1.4 4.6 10.8 16.1 23.9 37.7 55.8 65.6 70.5
											Black non-contaminating PVC jacket.						
60°C **RG-58/U Type**	**9201** CXC	100 U-500 500 U-1000 1000 1640 3280	30.4 U-152.4 152.4 U-304.8 304.8 500.0 1000.0	2.6 11.6 12.2 22.0 23.0 34.9 69.9	20 (solid) .032 bare copper 10.1Ω/M′ 33.1Ω/km	Poly-ethylene .116	2.95	.193	4.9	Bare copper 5.5Ω/M′ 18.0Ω/km 78% shield coverage	53.5	66%	28.5	93.5	1 10 50 100 200 400 700 900 1000	.33 1.2 3.1 4.5 6.8 10.0 14.0 16.0 17.0	1.1 3.9 10.2 14.8 22.3 32.8 45.9 52.5 55.8
											Black PVC jacket.						

Broadcast and Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
 ℛ 20063 300V 80°C **Dual RG-59/U Type**	**9555** **NEC** CL2 CXC FT 1	100 500 1000 2000	30.4 152.4 304.8 609.7	8.1 39.0 74.7 150.1	23 (solid) .023 bare copper covered steel 47Ω/M′ 154.2Ω/km	Poly-ethylene .146	3.71	.238 x .478	6.04 x 12.14	Bare copper 2.57Ω/M′ 8.4Ω/km 95% shield coverage	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	.6 1.1 2.4 3.4 4.9 7.0 9.7 11.1 12.0	2.0 3.6 7.9 11.5 16.1 23.0 31.8 36.4 39.4
											Black PVC jacket. **For Plenum version, see 89555 in Belden Master Catalog.**						
 ℛ 1354 60°C **RG-59/U Type**	**9259** **NEC** CL2 CXC FT 1	50 100 U-500 500 U-1000 1000	15.2 30.4 U-152.4 152.4 U-304.8 304.8	2.0 4.0 18.4 19.4 35.7 36.7	22 (7x30) .031 bare copper 15.0Ω/M′ 49.2Ω/km	Cellular Poly-ethylene .146	3.71	.242	6.15	Bare 2.6Ω/M′ 8.5Ω/km 95% shield coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.3 .9 2.1 3.0 4.5 6.6 8.9 10.1 10.9	1.0 3.0 6.9 9.8 14.8 21.7 29.2 33.1 35.8
											Black PVC jacket. For CCTV applications. **For Plenum versions, see 82259 or 89259 in Belden Master Catalog.**						

75 ohm *Brilliance*® Precision Video Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
 80°C	**8281A** NEW **NEC** CL2 CXC FT 1	500 U-1000	152.4 304.8	49.2 99.5	20 (solid) .031 bare copper 9.9Ω/M′ 32.5Ω/km	Poly-ethylene .198	5.03	.365	9.27	Tinned copper double braid 1.06Ω/M′ 3.5Ω/km 96% shield coverage	75	66%	21	69.0	1 10 50 100 200 400 700 900 1000	.25 .78 1.50 2.70 3.70 5.30 7.10 8.10 9.10	.8 2.6 4.9 8.9 12.1 17.4 23.3 26.6 29.8
	Use with Belden BNC0082 connector.										Black PVC jacket.						
	8281⊕	500 1000	152.4 304.8	36.1 73.5	20 (solid) .031 bare copper 9.9Ω/M′ 32.5Ω/km	Poly-ethylene .198	5.03	.305	7.75	Tinned copper double braid 1.06Ω/M′ 3.5Ω/km 96% shield coverage	75	66%	21	69.0	1 10 50 100 200 400 700 900 1000	.25 .78 1.50 2.70 3.70 5.30 7.10 8.10 9.10	.8 2.6 4.9 8.9 12.1 17.4 23.3 26.6 29.8
	Use with Belden BNC0081 connector.										Red, Yellow, Green, Light Blue, White, Orange, or Black polyethylene jacket. **For Plenum version, see 88281 in Belden Master Catalog.**						
 80°C	**9209**	U-500 U-1000	U-152.4 U-304.8	14.2 27.1	23 (solid) .023 bare copper 20.4Ω/M′ 66.9Ω/km	Poly-ethylene .146	3.71	.220	5.59	100% Duofoil® +96% tinned copper braid 4.5Ω/M′ 14.8Ω/km	75	66%	21	69.0	1 10 50 100 200 400 700 900 1000	.35 1.20 2.80 4.00 5.90 8.50 11.40 13.00 13.80	1.1 3.9 9.2 13.1 19.3 27.9 37.4 42.6 45.3
	Use with Belden BNC0079 connector.										Black polyethylene jacket.						

⊕ Request Technical Bulletin T/8-17 for connector information.
▾▾ Unswept version of RG-58.
Request quotations of RG/U cables not listed.

Coaxial

BELDEN

TV and Amateur Radio Cables

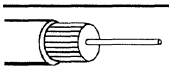
TV Camera Cables and CCTV Cables

RGB Bundled Coaxial Cables

Description U.L. Style	Trade No. NEC Type	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
1354 2668 30V 60°C **3-Coaxial**	**1164A** NEW NEC CL2X	500 1000	152.4 304.6	36.5 73.0	26 (19x38) .019 silver plated copper alloy 41.5Ω/M′ 136.1Ω/km	Datalene® .091	2.31	.388	9.86	Duobond® II +93% tinned copper braid 8.6Ω/M′ 28.2Ω/km 100% shield coverage	75	78%	17.3	56.8	1 3 5 10 30 50 100 500	.61 1.00 1.30 1.80 3.10 3.90 5.40 11.60	2.0 3.3 4.3 5.9 10.2 12.8 17.7 38.0
						.146 in. (3.71 mm) is O.D. of ea. indiv. coax					Overall Black PVC jacket; inner PVC jackets color-coded Red, Green, Blue.						
1354 2668 30V 60°C **4-Coaxial**	**1167A** NEW NEC CL2X	500 1000	152.4 304.9	42.0 86.0	26 (19x38) .019 silver plated copper alloy 41.5Ω/M′ 136.1Ω/km	Datalene .091	2.31	.435	11.05	Duobond II + 93% tinned copper braid 8.6Ω/M′ 28.2Ω/km 100% shield coverage	75	78%	17.3	56.8	1 3 5 10 30 50 100 500	.61 1.00 1.30 1.80 3.10 3.90 5.40 11.60	2.0 3.3 4.3 5.9 10.2 12.8 17.7 38.0
						.146 in. (3.71 mm) is O.D. of ea. indiv. coax					Overall Black PVC jacket; inner PVC jackets color-coded Red, Green, Blue, White.						

Conformable™ Coax Cables

Conformable Coax cables are for "black box" applications involving internal, head-end wiring of electronic equipment.

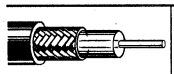
 200°C	**1168A** NEW	100‡ 250‡ 500‡	30.4 76.2 152.4	2.70 6.75 13.50	19 (solid) .0365″ silver coated copper covered steel 20.5Ω/M′ 67.2Ω/km	TFE Teflon® .116	2.95	.141	3.58	Copper-tin composite shield 4.5Ω/M′ 14.8Ω/km 100% shield coverage	50	70%	29.3	96.1	1 10 50 100 200 400 700 900 1000 4000	.4 1.0 2.4 3.5 5.0 7.6 10.0 12.0 13.0 30.0	1.3 3.3 7.9 11.5 16.4 25.0 32.8 39.4 42.6 98.4
	9307 NEW	500‡ 1000‡	152.4 304.8	10.0 10.2	24 (solid) .0201″ silver-coated copper covered steel 64.2Ω/M′ 210.6Ω/km	TFE Teflon .064	1.63	.083	2.11	Copper-tin composite shield 10.2Ω/M′ 33.5Ω/km 100% shield coverage	50	70%	29.3	96.1	1 10 50 100 200 400 700 900 1000 4000	1.0 2.0 4.5 6.5 9.2 13.0 17.0 20.7 22.0 44.0	3.3 6.6 14.8 21.3 30.2 42.7 55.8 67.9 72.2 144.3
	9308 NEW	500‡ 1000‡	152.4 304.8	9.8	29 (solid) .0113″ silver-coated copper covered steel 20.5Ω/M′ 67.2Ω/km	TFE Teflon .065	1.65	.084	2.13	Copper-tin composite shield 10.2Ω/M′ 33.5Ω/km 100% shield coverage	75	70%	19.5	64.0	1 10 50 100 200 400 500 700 900 1000 4000	1.2 2.4 4.5 6.6 10.0 15.0 17.0 21.0 24.0 26.0 60.0	3.9 7.9 14.8 21.7 32.8 49.2 55.8 68.9 78.7 85.3 196.8

‡ 100′: Exact one piece spools.
250′: Exact spools—multi-piece (max. 3 pieces min. length 50′).
500′: Exact spools—multi-piece (max. 5 pieces min. length 50′).
1000′: Exact spools—multi-piece (max. 8 pieces min. length 50′).
® DuPont trademark.

Coaxial

BELDEN

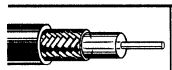
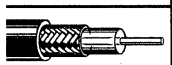
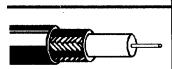
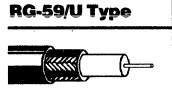
Broadcast and Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
 1354 60°C **RG-59/U Type**	**8241** **NEC** CL2 CXC FT 1	25 Black	7.6	.9	23 (solid) .023 bare copper covered steel 47Ω/M′ 154.2Ω/km	Poly-ethylene .146	3.71	.242	6.15	Bare copper 2.7Ω/M′ 8.9Ω/km 95% shield coverage	75	66%	21.0	68.9	1 10 50 100 200 400 700 900 1000	.6 1.1 2.4 3.4 4.9 7.0 9.7 11.1 12.0	2.0 3.6 7.9 11.2 16.1 23.0 31.8 36.4 39.4
		50 Black	15.2	2.2							Black PVC jacket. **For Plenum version, see 88241 in Belden Master Catalog.**						
		100 Black	30.4	4.3													
		U-500 500 U1000 1000 Red Yellow Green Lt. Blue White Orange Black	U-152.4 152.4 U-304.8 304.8	18.5 19.2 36.0 36.9													
		2000 5000 White Black	609.6 1524.0	77.5 192.0													

Broadcast Cables

80°C **RG-59B/U MIL-C-17D**	**8263†** **NEC** CL2X CXC FT 1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	18.1 18.8 35.2 36.1	23 (solid) .023 bare copper covered steel 47Ω/M′ 154.2Ω/km	Poly-ethylene .146	3.71	.242	6.15	Bare copper 2.6Ω/M′ 8.5Ω/km 95% shield	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	.6 1.1 2.4 3.4 4.9 7.0 9.7 11.1 12.0	2.0 3.6 7.9 11.2 16.1 23.0 31.8 36.4 39.4
											Black non-contaminating PVC jacket.						

Broadcast and MATV Cables

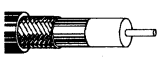
 80°C **MIL-C-17F M17/29-RG59 QPL**	**9204†** CXC FT 1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	18.1 18.7 35.2 36.0	23 (solid) .023 bare copper covered steel 47Ω/M′ 152.4Ω/km	Poly-ethylene .146	3.71	.241	6.12	Bare copper 2.6Ω/M′ 8.5Ω/km 95% shield coverage	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	.6 1.1 2.4 3.4 4.9 7.0 9.7 11.1 12.0	2.0 3.6 7.9 11.2 16.1 23.0 31.8 36.4 39.4
											Black non-contaminating PVC jacket.						
 1354 80°C **RG-59/U Type**	**9244** **NEC** CL2X CXC FT 1	U-500¶ 500¶ U-1000¶ 1000¶ 1640 3280	U-152.4 152.4 U-304.8 304.8 500 1000	15.9 16.7 30.8 31.7 47.9 98.2	22 (solid) .025 bare copper covered steel 55.0Ω/M′ 180.4Ω/km	Poly-ethylene .146	3.71	.240	6.10	Bare copper braid 4.5Ω/M′ 14.8Ω/km 86% shield coverage	73	66%	21.0	68.9	1 10 50 100 200 400 700 900 1000	.6 1.1 2.4 3.4 4.9 7.0 9.7 11.1 12.0	2.0 3.6 7.9 11.2 16.1 23.0 31.8 36.4 39.4
											Black PVC jacket. 100% Sweep Tested. 5–300 MHz.						
 60°C **RG-59/U Type**	**8221** CXC	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.8 17.0 17.8 33.0 33.9	22 (solid) .025 bare copper covered steel 55.0Ω/M′ 180.4Ω/km	Cellular Poly-ethylene .146	3.71	.242	6.15	Bare copper braid 2.6Ω/M′ 8.5Ω/km 95% shield coverage	80	78%	16.3	53.5	1 10 50 100 200 400 700 900 1000	.44 .90 2.0 2.9 4.1 5.9 7.8 8.8 9.9	1.4 3.0 6.6 9.5 13.5 19.4 25.6 28.9 32.5
											Gray, White, or Black PVC jacket.						
 60°C **RG-59/U Type**	**9240** CXC	U-500 500 U-1000¶ 1000¶	U-152.4 152.4 U-304.8 304.8	14.9 14.3 26.2 27.2	20 (solid) .032 bare copper covered steel 61.5Ω/M′ 201.7Ω/km	Cellular Poly-ethylene .146	3.71	.241	6.12	Bare copper braid 5.6Ω/M′ 18.4Ω/km 80% shield coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.6 1.0 2.1 3.0 4.5 6.6 8.9 10.1 10.9	2.0 3.3 6.9 9.8 14.8 21.6 29.2 33.1 35.8
											Black PVC jacket.						

† Passes VW-1 Vertical Wire Flame Test. ¶ Spools are one piece, but length may vary ±10% from length shown.
Request quotations of RG/U cables not listed.

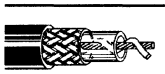
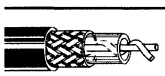
Coaxial

BELDEN

MATV Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
80°C **RG-59/U Type**	**9243** **NEC** CATV CXC FT 1	U-500¶ U-1000	U-152.4 U-304.8	11.5	20 (solid) .032 bare copper covered steel 61.5Ω/M′ 201.7Ω/km	Cellular Poly-ethylene .146	3.71	.242	6.15	Duofoil +67% aluminum braid 14.0Ω/M′ 45.9Ω/km 100% shield coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.6 1.0 1.8 2.5 3.7 5.4 7.4 8.4 8.9	2.0 3.3 5.9 8.2 12.1 17.7 24.3 27.6 29.2
											Black PVC jacket. 100% Sweep Tested. 5–550 MHz.						
80°C **RG-59/U Type**	**9266** CXC	U-500 500 U-1000 1000 2000	U-152.4 152.4 U-304.8 304.8 609.6	14.7 15.5 28.4 29.2 57.2	20 (solid) .032 bare copper covered steel 61.5Ω/M′ 201.7Ω/km	Cellular Poly-ethylene .146	3.71	.242	6.15	Duofoil +61% tinned copper braid 6.8Ω/M′ 22.3Ω/km coverage	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.6 1.0 1.8 2.5 3.7 5.4 7.4 8.4 8.9	2.0 3.3 5.9 8.2 12.1 17.7 24.3 27.6 29.2
											Black PVC jacket. 100% Sweep Tested. 5–450 MHz.						
 80°C **RG-59/U Type**	**9100** Replaces 9282 **NEC** CATV CXC FT 1	U-500¶ Black 1000¶ Black U-1000¶ Black White	152.4 304.8 304.8	11.2 22.3 21.3	20 (solid) .032 copper covered steel 61.5Ω/M′ 201.7Ω/km	Cellular Poly-ethylene .146	3.71	.242	6.15	Duobond® +40% aluminum braid 100% shield coverage 17.3Ω/M′ 56.7Ω/km	75	78%	17.3	56.7	1 10 50 100 200 400 700 900 1000	.6 1.0 1.8 2.5 3.7 5.4 7.4 8.4 8.9	2.0 3.3 5.9 8.2 12.1 17.7 24.3 27.6 29.2
											Black PVC jacket. 100% Sweep Tested. 5–550 MHz.						

Broadcast and Computer Cables

80°C **RG-62/U** **JAN-C-17A**	**8254** CXC	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.9 17.3 18.0 33.6 34.4	22 (solid) .025 bare copper covered steel 55Ω/M′ 180.4Ω/km	Semi-solid Poly-ethylene .146	3.71	.238	6.04	Bare copper 2.6Ω/M′ 8.5Ω/km 95% shield coverage	93	84%	13.5	44.3	1 10 50 100 200 400 700 900 1000	.5 .9 1.9 2.7 3.8 6.5 7.3 8.3 8.7	1.6 3.0 6.2 8.9 12.5 21.3 23.9 27.2 28.5
											Black PVC jacket.						
 1354 60°C **RG-62B/U** **MIL-C-17D**	**8255†** **NEC** CL2X CXC FT 1	U-500 500 U-1000 1000	U-152.4 152.4 U-304.8 304.8	17.8 18.5 34.6 35.6	24 (7x32) .025 bare copper covered steel 53.4Ω/M′ 175.2Ω/km	Semi-solid Poly-ethylene .146	3.71	.242	6.15	Bare copper 2.6Ω/M′ 8.5Ω/km 95% shield coverage	93	84%	13.5	44.3	1 10 50 100 200 400 700 900 1000	.31 .9 2.0 2.9 4.2 6.1 8.6 10.1 11.0	1.0 3.0 6.6 9.5 13.8 20.0 28.2 33.1 36.1
											Black non-contaminating PVC jacket.						
 1478 80°C **RG-62A/U Type**	**9268†** **NEC** CL2 CXC FT 1	U-500 500 U-1000 1000 2000	U-152.4 152.4 U-304.8 304.8 609.6	20.2 20.9 39.1 41.5 82.4	22 (solid) .025 bare copper covered steel 41.17Ω/M′ 135.0Ω/km	Semi-solid Poly-ethylene .146	3.71	.260	6.60	Bare copper 2.9Ω/M′ 9.5Ω/km 95% shield coverage	93	84%	13.5	44.3	1 10 50 100 200 400 700 900 1000	.25 .85 1.9 2.7 3.8 5.3 7.3 8.2 8.7	.8 2.8 6.2 8.9 12.5 17.4 23.9 26.9 28.5
											Black PVC jacket.						
1478 60°C **RG-62A/U Type**	**9269†** **NEC** CL2 CXC FT 1	100 250 U-500 500 U-1000 1000 5000	30.4 76.2 U-152.4 152.4 U-304.8 304.8 1524.0	4.0 9.0 17.9 18.5 34.7 35.6 182.3	22 (solid) .025 bare copper covered steel 41.17Ω/M′ 135.0Ω/km	Semi-solid Poly-ethylene .146	3.71	.242	6.15	Bare copper 2.9Ω/M′ 9.5Ω/km 95% shield coverage	93	84%	13.5	44.3	1 10 50 100 200 400 700 900 1000	.25 .85 1.9 2.7 3.8 5.3 7.3 8.2 8.7	.8 2.8 6.2 8.9 12.5 17.4 23.9 26.9 28.5
											PVC jacket. Color jackets available with U-1000 put-up. See price sheet for complete listing.						
1354 80°C **MIL-C-17F** **M17/30-RG62** **QPL**	**9862†** **NEC** CL2X CXC FT 1	U-500 500 U-1000 1000 2000	U-152.4 152.4 U-304.8 304.8 609.6	17.4 18.0 33.5 34.5 72.5	22 (solid) .025 bare copper covered steel 41.7Ω/M′ 135.0Ω/km	Semi-solid Poly-ethylene .146	3.71	.242	6.15	Bare copper 2.6Ω/M′ 8.5Ω/km 95% shield coverage	93	84%	13.5	44.3	1 10 50 100 200 400 700 900 1000	.25 .85 1.9 2.7 3.8 5.3 7.3 8.2 8.7	.8 2.8 6.2 8.9 12.5 17.4 23.9 26.9 28.5
											Black non-contaminating PVC jacket.						

¶ Spools are one piece, but length may vary ±10% from length shown. Request quotations of RG/U cables not listed.

† Passes VW-1 Vertical Wire FlameTest.

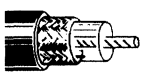
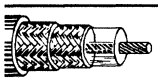
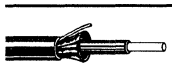
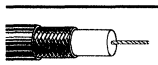
Coaxial

BELDEN

Broadcast, Computer, and Military Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
	9252	100	30.4	2.1	22 (27x36) .028 tinned copper 17.1Ω/M′ 56.1Ω/km	Poly-ethylene .096	2.44	.160	4.06	Tinned copper 5.2Ω/M′ 17.1Ω/km 97% shield coverage	50	66%	30.8	101.0	1	.4	1.3
		U-500	U-152.4	9.7											10	1.7	5.6
		500	152.4	9.4											50	4.5	14.8
		U-1000	U-304.8	18.4											100	7.0	23.0
		1000	304.8	18.2											200	11.0	36.1
															400	16.5	54.1
															700	23.5	77.1
															900	27.3	89.5
															1000	29.0	95.1
UL 1354 60°C **MIL-C-17F M17/157-00001 (RG 122/U[θ]) QPL**	CXC									Black non-contaminating PVC jacket.							
	8216	100	30.4	.8	26 (7x34) .019 bare copper covered steel 97Ω/M′ 318.2Ω/km	Poly-ethylene .060	1.52	.101	2.56	Tinned copper 10.3Ω/M′ 33.8Ω/km 88% shield coverage	50	66%	30.8	101.0	1	1.85	6.1
		500	152.4	4.4											10	3.30	10.8
		1000	304.8	8.1											50	5.75	18.9
															100	8.4	27.6
															200	12.5	41.0
															400	19.0	62.3
															700	27.0	88.6
															900	31.0	101.7
															1000	34.0	111.5
UL 1354 60°C **RG-174/U MIL-C-17D**	CXC									Black PVC jacket.							

Broadcast Cables

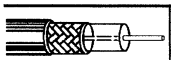
	**8267†**	500	152.4	55.0	13 (7x21) .089 bare copper 1.7Ω/M′ 5.6Ω/km	Poly-ethylene .285	7.24	.405	10.29	Bare copper 1.2Ω/M′ 3.9Ω/km 97% shield coverage	50	66%	30.8	101.0	1	.17	.56
		1000	304.8	108.0											10	.55	1.8
															50	1.3	4.3
															100	1.9	6.2
															200	2.7	8.9
															400	4.1	13.4
															700	6.5	21.3
															900	7.6	24.9
															1000	8.0	26.2
															4000	21.5	70.5
UL 1354 80°C **RG-213/U MIL-C-17D**	**NEC** CL2X CXC FT 1									Black non-contaminating PVC jacket.							
	**8268**	500	152.4	67.5	13 (7x.0296) .089 silver coated copper 1.7Ω/M′ 5.6Ω/km	Poly-ethylene .285	7.24	.425	10.80	2 silver coated copper .70Ω/M′ 2.3Ω/km 98% shield coverage	50	78%	30.8	101.0	1	.18	.59
		1000	304.8	133.0											10	.62	2.0
															50	1.5	4.9
															100	2.1	6.9
															200	3.0	9.8
															400	4.8	15.7
															700	6.5	21.3
															900	7.6	24.9
															1000	8.2	26.9
															4000	20.0	65.6
UL 1354 80°C **MIL-C-17F M17/164-00001 (RG214/U[θθ]) QPL**	**NEC** CL2X CXC FT 1									Black non-contaminating PVC jacket.							
	9273	100	30.4	3.9	19 (solid) .035 silver coated copper 8.1Ω/M′ 26.6Ω/km	Poly-ethylene .116	2.95	.212	5.38	2 silver coated copper 2.5Ω/M′ 8.2Ω/km 97% shield coverage	50	66%	30.8	101.0	1	.35	1.1
		U-500	U-152.4	18.5											10	1.2	3.9
		500	152.4	19.1											50	2.8	9.2
		U-1000	U-304.8	35.9											100	4.1	13.4
		1000	304.8	36.7											200	6.0	19.7
															400	8.8	28.9
															700	12.0	39.4
															900	13.8	45.3
															1000	14.5	47.6
UL 1354 60°C **MIL-C-17F M17/167-00001 (RG223/U[θθθ]) QPL**	**NEC** CL2X CXC FT 1									Black non-contaminating PVC jacket.							
	**9393**	100	30.4	.5	30 (solid) .010 coated copper 114.0Ω/M′ 373.9Ω/km	Cellular Poly-ethylene .064	1.63	.100 x .115	2.54 x 2.92	Beldfoil® & drain wire 48Ω/M′ 157.4Ω/km 100% shield coverage	93	78%	14.0	45.9	1	1.3	4.3
		500	152.4	2.9											10	3.0	9.8
		1000	304.8	5.1											50	6.4	21.0
															100	8.8	28.9
															200	12.4	40.7
															400	17.5	57.4
															700	23.0	75.4
															900	26.0	85.3
															1000	27.2	89.2
UL 1354 30V 60°C **Computer Cable**	CXC									Red PVC jacket.							
	**9221**	25	7.6	.2	30 (7x38) .012 tinned copper 100.0Ω/M′ 328.0Ω/km	Cellular High Density Poly-ethylene .058	1.47	.097	2.46	Tinned copper 11.65Ω/M′ 38.2Ω/km 89% shield coverage	75	78%	17.3	56.7	1	.8	2.6
		100	30.4	1.0											10	2.5	8.2
		U-500	U-152.4	4.0											50	5.9	19.4
		500	152.4	3.5											100	9.2	30.2
															200	15.0	49.2
															400	24.5	80.4
															700	36.0	118.1
															900	44.0	144.3
															1000	48.0	157.4
UL 1354 30V 60°C	CXC									Black PVC jacket.							

† Passes VW-1 Vertical Wire Flame Test.
[θ] Unswept version of RG-122.
[θθ] Unswept version of RG-214.
[θθθ] Unswept version of RG-223.
Request quotations of RG/U cables not listed.

Coaxial

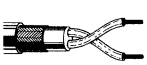
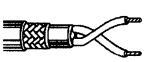
BELDEN

Broadcast Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/ 100 ft.	Nominal Attenuation db/ 100 m
 UL 1354 60°C	**8218** CXC	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	1.6 7.3 7.0 13.6 14.2	27 (7x35) .017 bare copper covered steel 112.0Ω/M′ 367.4Ω/km	Poly-ethylene .100	2.54	.150	3.81	Tinned copper 6.5Ω/M′ 21.3Ω/km 93% shield coverage	75	66%	20.5	67.2	1 10 50 100 200 400 700 900 1000	1.2 2.4 4.2 5.7 8.3 12.1 16.5 19.0 20.0	3.9 7.9 13.8 18.7 27.2 39.7 54.1 62.3 65.6
											Black PVC jacket.						

Triaxial

Broadcast and Computer Cables

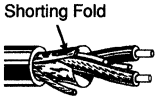
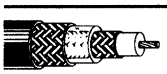
UL 2092 300V 60°C	**9272**† **NEC** CM PCC FT 1	100 U-100 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	4.3 19.3 20.0 37.6 38.6	20 (7x28) .037 tinned copper 9.5Ω/M′ 31.2Ω/km	Poly-ethylene color-coded Clear Blue .156	3.96	.244	6.20	Tinned copper 3.4Ω/M′ 11.2Ω/km 93% shield coverage	78	66%	19.7	64.6	1 10 50 100 200 400	.6 2.1 5.0 7.5 11.0 16.0	2.0 6.9 16.4 24.6 36.1 52.5
											Blue PVC jacket. **For Plenum version, see 89272 in Belden Master Catalog.**						
Z-Fold™ UL 2582 150V 60°C	**9463**† **NEC** CM PCC FT 1	100 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.9 17.8 16.6 34.8 35.8	20 (7x28) .038 tinned copper 9.5Ω/M′ 31.2Ω/km	Poly-ethylene color-coded Clear Blue .156	3.96	.243	6.17	Beldfoil® +57% tinned copper braid 4.1Ω/M′ 13.4Ω/km 100% shield coverage	78	66%	19.7	64.6	1 10 50 100 200 400	.6 2.1 5.0 7.5 11.0 16.0	2.0 6.9 16.4 24.6 36.1 52.5
											Blue PVC jacket.						
 UL 2598 300V 80°C	**8227**† **NEC** CL2 PCC FT 1	500 1000 2000	152.4 304.8 609.6	28.6 60.9 118.9	20 (7x28) .037 1 tinned copper 1 bare copper 9.5Ω/M′ 31.2Ω/km	Poly-ethylene .228	5.80	.325	8.26	Tinned copper 2.7Ω/M′ 8.9Ω/km 85% shield coverage	100	66%	15.5	50.9	1 10 50 100 200 400	.4 1.1 2.5 4.1 6.4 10.2	1.3 3.6 8.2 13.4 21.0 33.5
											Black PVC jacket.						
 UL 2498 300V 80°C	**9207**† **NEC** CL2X PCC FT 1	100 U-500 500 1000 1640 2000 3280 5000	30.4 U-152.4 152.4 304.8 499.9 609.6 999.7 1524.0	6.6 30.8 31.6 64.5 106.0 131.0 212.0 358.8	20 (7x28) .037 1 tinned copper 1 bare copper 9.5Ω/M′ 31.2Ω/km	Poly-ethylene .236	5.99	.330	8.38	Tinned copper 2.0Ω/M′ 6.6Ω/km 95% shield coverage	100	66%	15.5	50.9	1 10 50 100 200 400	.3 1.2 2.8 4.1 6.4 10.2	1.0 3.9 9.2 13.4 21.0 33.5
											Black PVC jacket. **For Plenum version, see 89207 in Belden Master Catalog.**						
Shorting Fold UL 2092 300V 60°C	**9271** **NEC** CM PCC FT 1	1000 U-500 500 U-1000 1000	30.4 U-152.4 152.4 U-304.8 304.8	3.0 13.6 14.2 26.1 27.0	25 (7x33) .021 tinned copper 31.8Ω/M′ 104.3Ω/km	Poly-ethylene color-coded Clear Blue .236	5.99	.240	6.10	Beldfoil w/stranded tinned copper drain wire 12.0Ω/M′ 39.4Ω/km 100% shield coverage	124	66%	12.2	40.0	1 10 50 100 200 400	.6 1.7 3.6 5.0 6.9 9.6	2.0 5.6 11.8 16.4 22.6 31.5
											Blue PVC jacket.						

† Passes VW-1 Vertical Wire Flame Test.

Triaxial

BELDEN

Broadcast and Computer Cables

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) [Dia. in In.] Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
2448 30V 60°C	**9860†** **NEC** CL2X PCC FT 1	500 1000 2000	152.4 304.8 609.6	54.2 106.3 213.6	16 (solid) .051 bare copper 4.2Ω/M′ 13.8Ω/km	Cellular Polyethylene color coded Blue .322	8.18	.440	11.18	Duofoil® 92% tinned copper braid 1.3Ω/M′ 4.3Ω/km 100% shield coverage	124	78%	Between Cond. 10.9 shield ungrn'd	35.8	1 10 50 100 200 400	.18 .71 1.8 2.9 4.1 6.2	.6 2.3 5.9 9.5 13.4 20.3
											Black PVC jacket.						
2668 30V 60°C	**9182†** **NEC** CL2X PCC FT 1	U-500 500 1000	U-152.4 152.4 304.8	25.8 27.5 57.5	22 (19x34) .031 tinned copper 15Ω/M′ 49.2Ω/km	Datalene® color coded Black, Yellow .275	6.99	.350	8.89	Duofoil with stranded tinned copper drain wire 6.3Ω/M′ 20.7Ω/km 100% shield coverage	150	78%	8.8	28.9	1 10 50 100 200 400	.40 1.2 2.7 4.3 6.2 8.8	1.3 3.9 8.9 14.1 20.3 28.9
											Black PVC jacket. **For Plenum version, see 89272 in Belden Master Catalog.**						
Shorting Fold  2777 300V 60°C	**9851†** PCC FT 1	100 500 1000	30.4 152.4 304.8	2.3 10.2 19.0	29 (solid) .0113 silver plated copper covered steel 202Ω/M′ 622Ω/km	Flame Retardant Cellular Polyethylene color coded White, Blue .193	4.90	.245	6.22	Duofoil with stranded tinned copper drain wire 25Ω/M′ 82Ω/km 100% shield coverage	200	76%	6.7	22.0	1 10 50	1.7 2.0 3.8	5.6 6.6 12.5
											Chrome PVC jacket.						
 80°C **RG-59/U Type** Triax Cable	**9888**	500 1000	152.4 304.8	72.8 142.4	11 (7x19) .108 bare copper 1.2Ω/M′ 3.9Ω/km	Cellular Polyethylene .285	7.24	.480	12.19	2 bare copper Inner 1.2Ω/M′ 3.9Ω/km Outer 2.1Ω/M′ 6.9Ω/km 96% shield coverage	50	78%	26.0	85.3	1 10 50 100 200 400 700 900 1000	.14 .51 1.2 1.8 2.7 4.2 5.8 6.7 7.1	.5 1.7 3.9 5.9 8.9 13.8 19.0 22.0 23.3
											Polyethylene insulation between braids. Black polyethylene jacket.						

† Passes VW-1 Vertical Wire Flame Test.

Flat Cable
9L280XX Series

BELDEN

.050 Pitch Flat Cable

Computer and Instrumentation
28 Gage
Stranded Conductors (7x36)

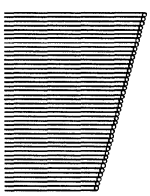
Product Description
Tinned copper (.050 conductor spacing). Gray PVC insulation. Red polarity stripe. Low temperature MIL-C-49055/1-xx with Belden corresponding trade numbers are listed on this page.

For additional gage size and centering options, contact your nearest Belden Distributor or Belden Sales Representative.

Will terminate to any standard IDC connector.

Standard Specifications

Voltage Rating	300V rms
Dielectric Withstand Voltage	2000V rms
Propagation Delay	GSG 1.40 ns/ft. (4.6 ns/M) nom.
Insulation Resistance	10^3MΩ (10 ft. sample)
Characteristic Impedance	150ΩGS, 105ΩGSG
Nominal Capacitance @ 1 MHz	10pF/ft. (33 pF/m) GS 15 pF/ft. (49 pF/m) GSG
Inductance @ 1 MHz	0.29 µH/ft. (.95 µH/m) GS 0.20 µH/ft. (.66 µH/m) GSG
Standard Put-Up Lengths	100 ft. (30.4 m) 300 ft. (91.4 m)
Cable Configuration Tested	GS=Ground–Signal GSG=Ground–Signal–Ground

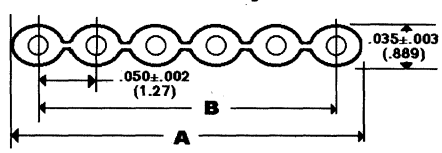


2651
300V 105°C
T1

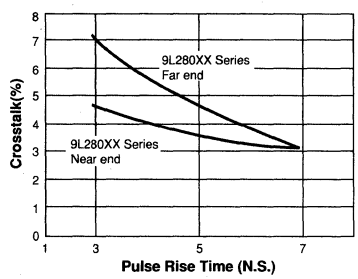
Description U.L. Style C.S.A. Type	Trade No.	Belden MIL-Spec No.	No. of Cond.	Nominal Width A Inch	A mm	B Inch	B mm
	9L28009†	YP-3289ᵀ	9	.45	11.43	.400	10.2
	9L28010†	YP-3290ᵀ	10	.50	12.70	.450	11.4
	9L28014†	YP-3291ᵀ	14	.70	17.78	.650	16.5
	9L28015†	YP-3292ᵀ	15	.75	19.05	.700	17.8
	9L28016†	YP-3293ᵀ	16	.80	20.32	.750	19.1
	9L28020†	YP-3294ᵀ	20	1.00	25.40	.950	24.1
	9L28024†	YP-3295ᵀ	24	1.20	30.48	1.150	29.2
	9L28025†	YP-3296ᵀ	25	1.25	31.75	1.200	30.5
	9L28026†	YP-3297ᵀ	26	1.30	33.02	1.250	31.8
	9L28034†	YP-3298ᵀ	34	1.70	43.18	1.650	41.9
	9L28036†	—	36	1.80	45.72	1.750	44.5
	9L28037†	YP-3299ᵀ	37	1.85	46.99	1.800	45.7
	9L28040†	YP-3300ᵀ	40	2.00	50.80	1.950	49.5
	9L28050†	YP-3301ᵀ	50	2.50	63.50	2.450	62.2
	9L28060†	YP-3302ᵀ	60	3.00	76.20	2.950	74.9
	9L28064†	YP-3303ᵀ	64	3.20	81.28	3.150	80.0

† Passes VW-1 Vertical Wire Flame Test.
ᵀ These cables are specially built and are QPL per MIL-C-49055/1B.

Dimensions inch (mm)
9L280XX Series Gray

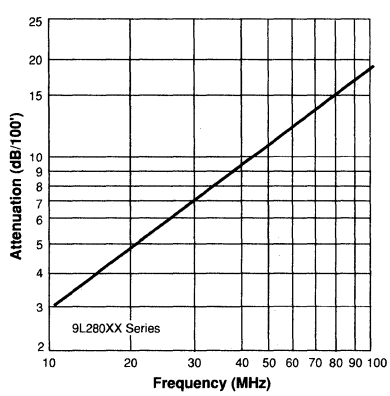


9L Series Typical Unbalanced Crosstalk Results*



*GSG

Attenuation*



Flat Cable
8V280XX Series High-Temperature

BELDEN

.050 Pitch Vari-Twist® Flat Cable

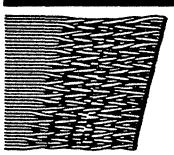
Computer and Instrumentation
28 Gage
Stranded Conductors (7x36)

Product Description
Silver plated copper (.050 conductor spacing in flat section). FEP pre-insulated twisted pairs laminated to a clear FEP substrate. Standard twist 18" followed by 2" flat. Each adjacent pair is twisted in an opposite direction.

- Each pair consists of a Tan conductor paired with a color-coded conductor.
- Color sequence each terminating section: Brown/Tan, Red/Tan, Orange/Tan, Yellow/Tan, Green/Tan, Blue/Tan, Violet/Tan, Gray/Tan, White/Tan, Black/Tan. Sequence is repeated as necessary.

Standard Specifications

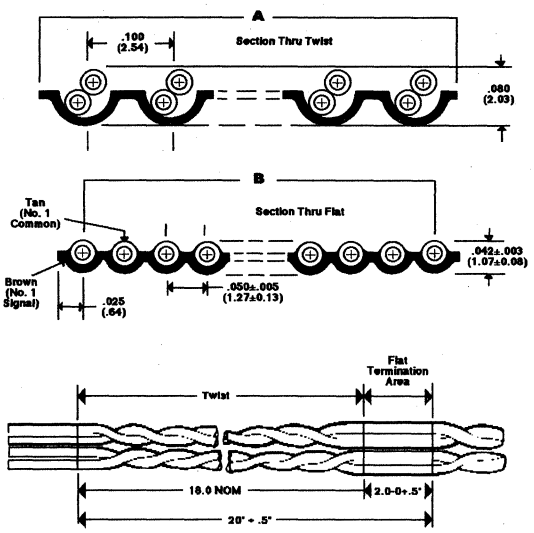
Voltage Rating	150V rms (300V non-U.L.)
Dielectric Withstand Voltage	2000V rms
Propagation Delay	1.32 ns/ft. (4.4 ns/M) nom.
Insulation Resistance	10^3MΩ (10 ft. sample)
Characteristic Impedance	130Ω
Nominal Capacitance @ 1 MHz	10.6 pF/ft. (34.78 pF/m) GS
Inductance @ 1 MHz	0.22 µH/ft. (.72 µH/m)
Standard Put-Up Length	100 ft. (30.4 m)
Temperature Rating	–70°C to 150°C (200°C non-U.L.)

Description U.L. Style	Trade No.	No. of Pairs	Nominal Width A Inch	A mm	B Inch	B mm
	**8V28010†***	5	.50	12.7	.45	11.43
	8V28014†*	7	.70	17.8	.65	16.51
	8V28016†*	8	.80	20.3	.75	19.05
	8V28020†*	10	1.00	25.4	.95	24.13
	8V28026†*	13	1.30	33.0	1.25	31.75
	8V28034†*	17	1.70	43.2	1.65	41.91
	8V28036†*	18	1.80	45.7	1.75	44.50
	8V28040†*	20	2.00	50.8	1.95	49.53
	8V28050†*	25	2.50	63.5	2.45	62.23
	8V28060†*	30	3.00	76.2	2.95	74.93
	8V28064†*	32	3.20	81.3	3.15	80.01

20468
150V 150°C
(300V non U.L.)

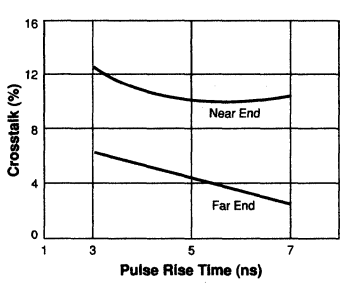
† Passes VW-1 Vertical Wire Flame Test.
* Passes IEEE 383 70,000 BTU Flame Test.

Dimensions inch (mm)

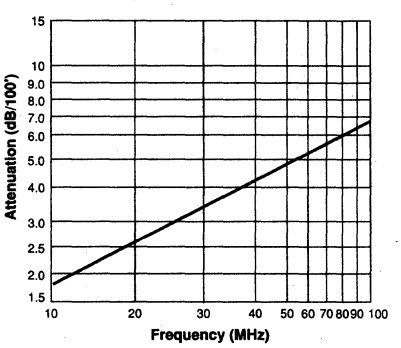


**The transition area is included in the twisted section to assure a full two inches of .050" termination area. Request Technical Bulletin T/8-44–Issue 1.

8V Cables Unbalanced Crosstalk



Attenuation 8V Cables



Flat Cable
9V280XX Series

BELDEN

.050 Pitch Vari-Twist® Flat Cable

Computer and Instrumentation
28 Gage
Stranded Conductors (7x36)

Product Description
Tinned copper (.050 conductor spacing). PVC preinsulated. Twisted pairs laminated to a clear PVC substrate. Standard twist length is 18 inches followed by a 2-inch flat section. Each adjacent pair is twisted in an opposite direction.

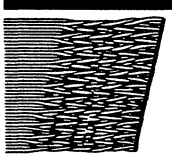
- Each pair consists of a Tan conductor paired with a color-coded conductor.
- Color sequence each terminating section: Brown/Tan, Red/Tan, Orange/Tan, Yellow/Tan, Green/Tan, Blue/Tan, Violet/Tan, Gray/Tan, White/Tan, Black/Tan. Sequence is repeated as necessary.

Variations in length of twisted or flat sections available upon request.

Will terminate to any standard IDC.

Standard Specifications

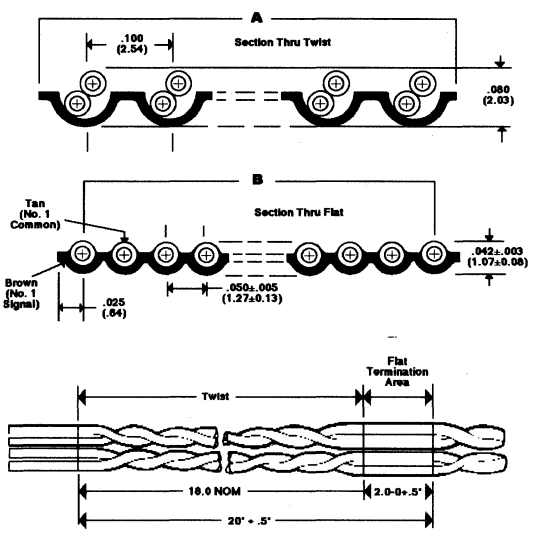
Voltage Rating ..... 300V rms
Dielectric Withstand Voltage ..... 2000V rms
Propagation Delay ..... 1.6 ns/ft. (5.3 ns/M) nom.
Insulation Resistance ..... 10^3MΩ (10 ft. sample)
Characteristic Impedance 100Ω
Nominal Capacitance @ 1 MHz .... 16 pF/ft. (52 pF/m) GS
Inductance @ 1MHz ..... 0.24 μ H/ft (.79 μH/m)
Standard Put-Up Length ..... 100 ft. (30.4 m)
Temperature Rating ..... –20°C to 105°C

Description U.L. Style	Trade No.	No. of Pairs	Nominal Width A Inch	A mm	B Inch	B mm
	**9V28010†**	5	.50	12.7	.45	11.43
	9V28014†	7	.70	17.8	.65	16.51
	9V28016†	8	.80	20.3	.75	19.05
	9V28020†	10	1.00	25.4	.95	24.13
	9V28026†	13	1.30	33.0	1.25	31.75
	9V28034†	17	1.70	43.2	1.65	41.91
	9V28036†	18	1.80	45.7	1.75	44.50
	9V28040†	20	2.00	50.8	1.95	49.53
	9V28050†	25	2.50	63.5	2.45	62.23
	9V28060†	30	3.00	76.2	2.95	74.93
	9V28064†	32	3.20	81.3	3.15	80.01

UL 2693 300V 105°C and/or UL 2697 300V 80°C

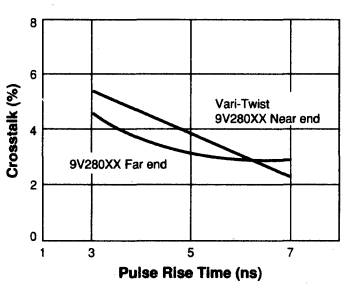
† Passes VW-1 Vertical Wire Flame Test.

Dimensions inch (mm)

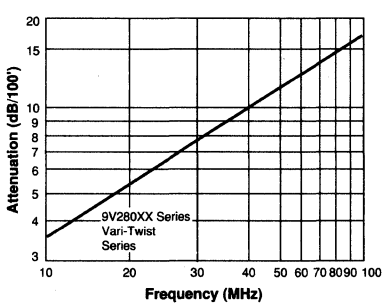


**The transition area is included in the twisted section to assure a full 2 inches of .050″ termination area. Request Technical Bulletin T/8-44-Issue 1.

9V Cables Unbalanced Crosstalk



Attenuation 9V Cables

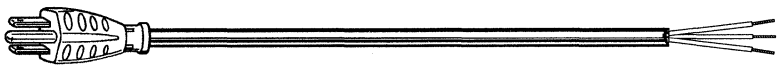


Power Supply Cords

BELDEN

Trade No.		Length of Cord		Pack-aging	Color Coding	AWG stranding [Dia. in mm]	Nominal O.D.		Rating	Type of Cordage	Jacket Color
Plug	Conn.	ft.	m				Inch	mm			

NEMA 5-15P



Molded PVC
Grounding Plug PH-290B or PH-185

Outer Jacket Stripped 1-1/2″
Conductors Stripped and Twisted 5/8″

Type SVT PVC Jacketed

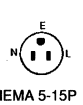
Three conductor SVT cords may now be used on some small tools, business machines, and instruments.

17237	6′	1.83	B-50 S	N.A.	18 (41x34) [1.19]	.246	6.25	1250 Watts 10A-125V	SVT	Gray
290B					**N.S.N.** 6150-01-057-0941; 5995-01-216-5591++					
17239	8′	2.44	B-50 S	N.A.	18 (41x34) [1.19]	.246	6.25	1250 Watts 10A-125V	SVT	Gray
290B					**N.S.N.** 6150-00-433-1104+					

Type SV Rubber

Three conductor SV cords may now be used on some small tools, business machines, and instruments.

17236 290B	6′	1.83	B-50 S	N.A.	18 (41x34) [1.19]	.246	6.25	1250 Watts 10A-125V	SV	Black
17238 290B	8′	2.44	B-50 S	N.A.	18 (41x34) [1.19]	.246	6.25	1250 Watts 10A-125V	SV	Black



NEMA 5-15P

Molded PVC
Grounding Plug PH-290B or PH-185

Outer Jacket Stripped 2″
Conductors Stripped and Twisted 5/8″

Type SJT

17405 290B	6′	1.83	B-50 S	N.A.	18 (16x30) [1.19]	.315	8.00	1250 Watts 10A-125V	SJT	Gray
17407 290B	8′	2.44	B-100 S	N.A.	18 (16x30) [1.19]	.315	8.00	1250 Watts 10A-125V	SJT	Gray
17276	20′	6.10	C-25 S	N.A.	16 (26x30) [1.52]	.340	8.64	1625 Watts 13A-125V	SJT	Gray
185					**N.S.N.** 6150-00-482-6353					

Type SJ Rubber and SJO Neoprene

For all tools as sanders, saws, grinders, and polishers requiring grounding. Except for double insulated tools, U.L. requires three conductor cords on all portable electric tools.

17406	6′	1.83	B-50 S	N.A.	18 (16x30) [1.19]	.315	8.00	1250 Watts 10A-125V	SJ	Black
185					**N.S.N.** 6150-00-809-8126; 4920-00-087-0067+; 6150-01-260-9137++					
17408	8′	2.44	B-50 S	N.A.	18 (16x30) [1.19]	.315	8.00	1250 Watts 10A-125V	SJ	Black
185										
17409	8′	2.44	B-50 S	N.A	18 (16x30) [1.19]	.315	8.00	1250 Watts 10A-125V	SJ	Black
185					**N.S.N.** 4935-01-014-5202; 6150-00-198-7395++					
17412	12′	3.66	B-50 S	N.A.	18 (16x30) [1.19]	.315	8.00	1250 Watts 10A-125V	SJ	Black
185					**N.S.N.** 6150-00-632-6117					
17419	9′	2.74	B-50 S	N.A.	16 (16x30) [1.52]	.340	8.64	1625 Watts 13A-125V	SJ	Black
185					**N.S.N.** 5995-01-073-7428; 6150-00-071-1180+; 6150-00-064-5886					
17422	12′	3.66	B-50 S	N.A.	16 (26x30) [1.52]	.340	8.64	1625 Watts 13A-125V	SJ	Black
185										
17425	15′	4.57	S	N.A.	16 (26x30) [1.52]	.340	8.64	1625 Watts 13A-125V	SJ	Black
185										

N.A. North American Color Coding.
N.S.N. National Stock Number.

++ Bulk packaging.
+ Single package.

Power Supply Cords

BELDEN

NEMA 5-15P

Molded Grounding Plug PH-290B, PH-185 or PH-173

Molded PVC Grounding Connector PH-386

Contact View

Duofoil® + Braid Shielded, PVC Jacketed

Trade No. Plug	Trade No. Conn.	Length of Cord ft.	Length of Cord m	Pack-aging	Color Coding	AWG stranding [Dia. in mm]	Nominal O.D. Inch	Nominal O.D. mm	Rating	Type of Cordage	Jacket Color
17660	290B 386A	6'7"	2	C-25	CEE	18 (41x34) [1.19]	.307	7.80	1250 Watts 10A-125V	SVT Z-Fold™ Duofoil + 85% braid	Black
17661	290B 386A	9'10"	3	C-25	CEE	18 (41x34) [1.19]	.307 **N.S.N.** 6150-01-262-9606	7.80	1250 Watts 10A-125V	SVT Z-Fold Duofoil + 85% braid	Black

Beldfoil® Shielded, PVC Jacketed

17725	290B 386A	6'7" 105°C	2 VW-1	B-100 C-25	CEE	18 (41x34) [1.19]	.270	6.86	1250 Watts 10A-125V	SVT Beldfoil shielded	Black
17742	290B 386A	6'7"	2	B-100 C-25	CEE	18 (41x34) [1.19]	.270 **N.S.N.** 6150-01-134-9121	6.86	1250 Watts 10A-125V	SVT Beldfoil shielded	Black
17743	290B 386A	9'10"	3	B-100 C-25	CEE	18 (41x34) [1.19]	.270	6.86	1250 Watts 10A-125V	SVT Beldfoil shielded	Black
17729	185 386A	6'7" 105°C	2 VW-1	B-100 C-25	CEE	18 (41x34) [1.19]	.340	8.64	1250 Watts 10A-125V	SJT Beldfoil shielded	Black
17600	185 386A	6'7"	2	B-100 C-25, S	CEE	18 (41x34) [1.19]	.340 **N.S.N.** 6150-01-114-6606	8.64	1250 Watts 10A-125V	SJT Beldfoil shielded	Black
17601	185 386A	9'10"	3	B-100 C-25	CEE	18 (41x34) [1.19]	.340 **N.S.N.** 6150-01-114-6607	8.64	1250 Watts 10A-125V	SJT Beldfoil shielded	Black
17602	185 386E	6'7"	2	B-100 C-25	CEE	16 (65x34) [1.47]	.365 **N.S.N.** 4920-01-180-9542	9.27	1625 Watts 13A-125V	SJT Beldfoil shielded	Black
17603	185 386E	9'10"	3	B-100 C-25	CEE	18 (65x34) [1.47]	.365	9.27	1625 Watts 13A-125V	SJT Beldfoil shielded	Black
17604	173 386E	6'7"	2	B-100 C-25	CEE	18 (41x30) [1.91]	.402 **N.S.N.** 6150-01-262-8554	10.21	1875 Watts 15A-125V	SJT Beldfoil shielded	Black
17605	173 386E	9'10"	3	B-50 C-25, S	CEE	18 (41x30) [1.91]	.402 **N.S.N.** 6150-01-212-7049	10.21	1875 Watts 15A-125V	SJT Beldfoil shielded	Black

Unshielded, PVC Jacketed

17757	290B 386	7'6" 105°C	2.29 VW-1	B-50 C-25	CEE	18 (41x34) [1.19]	.246	6.25	1250 Watts 10A-125V	SVT	Black
17251	290B 386	7'6"	2.29	B-50 C-25, S	CEE	18 (41x34) [1.19]	.246 **N.S.N.** 6150-01-254-2625 **N.S.N.** 6150-01-084-6385	6.25	1250 Watts 10A-125V	SVT	Black
17250	290B 386	7'6"	2.29	B-100 C-25, S	N.A.	18 (41x34) [1.19]	.246 **N.S.N.** 6150-01-004-8773	6.25	1250 Watts 10A-125V	SVT	Black
17758	290B 386A	6'7" 105°C	2 VW-1	B-100 C-25	CEE	18 (41x34) [1.19]	.315	8.00	1250 Watts 10A-125V	SJT	Black
17500	290B 386A	6'7"	2	B-100 C-25	CEE	18 (41x34) [1.19]	.315 **N.S.N.** 6150-01-148-2738	8.00	1250 Watts 10A-125V	SJT	Black
17501	290B 386A	9'10"	3	B-100 C-25, S	CEE	18 (41x34) [1.19]	.315 **N.S.N.** 6150-01-214-2350	8.00	1250 Watts 10A-125V	SJT	Black
17502	185 386E	6'7"	2	B-100 C-25, S	CEE	16 (65x34) [1.47]	.340 **N.S.N.** 6150-01-091-8022	8.64	1625 Watts 13A-125V	SJT	Black
17255	185 386E	7'6"	2.29	B-100 C-25,S	N.A.	16 (65x34) [1.47]	.340 **N.S.N.** 6150-01-144-7706	8.64	1625 Watts 13A-125V	SJT	Black
17503	185 386E	9'10"	3	B-100 C-25	CEE	16 (65x34) [1.47]	.340 **N.S.N.** 6150-01-127-2127	8.64	1625 Watts 13A-125V	SJT	Black
17504	173 386E	6'7"	2	B-100 C-25	CEE	14 (41x30) [1.91]	.380 **N.S.N.** 6150-01-151-4643	9.65	1875 Watts 15A-125V	SJT	Black
17505	173 386E	9'10"	3	B-100 C-25, S	CEE	14 (41x30) [1.91]	.380	9.65	1875 Watts 15A-125V	SJT	Black

CEE North American Color Coding. N.A. North American Color Coding. N.S.N. National Stock Number.

Power Supply Cords

BELDEN

Filtered Line Cord

Trade No.		Length of Cord		Pack-aging	Color Coding	AWG stranding [Dia. in mm]	Nominal O.D.		Rating	Fuse Rating	Type of Cordage	Jacket Color
Plug	Conn.	ft.	m				Inch	mm				

NEMA 5-15P

Connector IEC 320/C13

Contact View

Filtered Line Cord

17570	6'7"	2.00	S-10	CEE	18 (41x34) [1.19]	.270	6.86	1250 Watts 10A-125V	—	SVT Beldfoil Shielded	Black
	60°C										

Fused Line Cords

NEMA 5-15P

Molded PVC Fused Plug PHC-816

Outer Jacketed Stripped 1-1/2"
Conductors Stripped and Twisted 5/8"

3-Conductor Fused Cords

17790	6'	1.83	B-25 S	NA	18 (41x34) [1.19]	.315	8.00	750 Watts 6A-125V	6 amp	SJT	Black
816	60°C										
17791	6'	1.83	B-25 S	NA	18 (41x34) [1.19]	.315	8.00	500 Watts 4A-125V	4 amp	SJT	Black
816	60°C										
17792	6'	1.83	B-25 S	NA	18 (41x34) [1.19]	.315	8.00	250 Watts 2A-125V	2 amp	SJT	Black
816	60°C										

Replacement Fused Prongs

Replacement fuses are available from over 3500 Belden and Bussmann electronic and electrical distributor locations coast-to-coast. Each convenient package contains five ready-to-use fused prongs. Cord design prohibits replacement with an oversize (higher rated) fused prong.

Trade No.	Fuse Rating	Packaging	Equivalent Bussmann Part No.
17782	2 amp	B-100	ECF-2
17784	4 amp	B-100	ECF-4
17786	6 amp	B-100	ECF-6

NA North American Color Coding.
CEE European Color Coding.

Molded Cable Assemblies

BELDEN

25 Position D-Subminiature Cable Assemblies— Beldfoil Shielded (General Purpose)

Trade No.	Gender	Length ft.	Length m	Conductors No.	Conductors AWG (stranding)	Shield Type	Shield Drain Wire	Insulation Material Inch	Insulation Material mm	Jacket Material Inch	Jacket Material mm	Nominal O.D. Inch	Nominal O.D. mm
49668	Male/Male	5	1.5	25	24 (7x32) T.C. [.61]	Beldfoil®	24 (7x32)	S-R PVC .010	.254	PVC .040	1.016	.355	9.017
49669	Male/Male	10	3.0										
49670	Male/Male	25	7.6										
49671	Male/Male	50	15.2										
49672	Male/Male	70	21.3										
49673	Male/Female	5	1.5										
49674	Male/Female	10	3.0										
49675	Male/Female	25	7.6										
49676	Male/Female	50	15.2										
49677	Male/Female	70	21.3										

Cable 9543; see Belden Master Catalog.

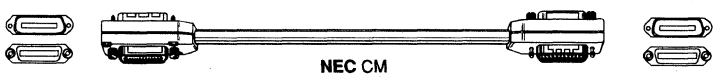
Contact View — 2464 300V 80°C — Contact View

Molded PVC Connector PH-793B Molded PVC Connector PH-793B

GPIB Unshielded Molded Cable Assemblies

49642	Male/Female Each End	3.3	1	23	26 (7x34) T.C. 6 pairs 26 (7x34) T.C. 10 singles 24 (7x32) T.C. 1 single	Beldfoil + 90% braid	26 (7x34)	S-R PVC .010	.254	PVC .035	.889	.350	8.89
49643	Male/Female Each End	6.6	2										
49657	Male/Female Each End	9.9	3										
49644	Male/Female Each End	13.1	4										
49645	Male/Female Each End	26.2	8										
49646	Male/Female Each End	52.5	16										

Color code chart No. 6; refer to Belden Master Catalog. RI38601, page 348.
Gull Gray jacket color.



Contact View — NEC CM — 2464 300V 80°C — Contact View

Molded PVC Connector PH-810C Molded PVC Connector PH-810C

IEEE 802.3 Molded LAN Transceiver Cable Assemblies (Office Version), Right Angle to Right Angle, Straight to Straight Handles

49780	Male/Female	6.5	2	8	28 (7x36) [.381]	Individual Beldfoil overall Duofoil + braid	24 (7x32)	Polypropylene .035	.889	PVC .044	1.117	.260	6.60
49781	Male/Female	16.4	5										

Light DEC Gray jacket color. Cable 9903; see Belden Master Catalog.

Contact View — NEC CL2 — 2919 30V 80°C — Contact View

Molded PVC Connector PH-792B Molded PVC Connector PH-792B

IEEE 802.3 Molded LAN Transceiver Cable Assemblies (Office Version), Right Angle Handles Both Ends

49782	Male/Female	6.5	2	8	28 (7x36) T.C. [.381]	Individual Beldfoil overall Duofoil + braid	24 (7x32)	Polypropylene .035	.889	PVC .044	1.117	.260	6.60
49783	Male/Female	16.4	5										

Light DEC Gray jacket color. Cable 9903; see Belden Master Catalog.

Contact View — NEC CL2 — 2919 30V 80°C — Contact View

Molded PVC Connector PH-784B Molded PVC Connector PH-784B

▲ Xerox trademark.

Molded Cable Assemblies

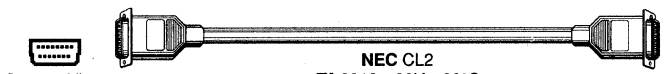
BELDEN

Trade No.	Gender	Length ft.	Length m	Conductors No.	Conductors AWG (stranding) [Dia. in mm]	Shield Type	Shield Drain Wire	Insulation Material Inch	Insulation Material mm	Jacket Material Inch	Jacket Material mm	Nominal O.D. Inch	Nominal O.D. mm

IEEE 802.3 PVC Molded LAN Transmission Assemblies— Straight Handles, Both Ends

49784	Male/Female	16.4	5.0	8	20 (7x28) T.C. [.76]	Individual Beldfoil® overall Duofoil® + braid	22 (7x30)	Datalene® .020	.508	PVC .035	.889	.420	10.16
49785	Male/Female	32.8	10.0										
49786	Male/Female	65.6	20.0										
49787	Male/Female	131.2	40.0										

Light DEC Gray jacket color. Cable 9901; see Belden Master Catalog.



Contact View — **NEC** CL2 — 2919 30V 80°C — Contact View

Molded PVC Connector PH-792B Molded PVC Connector PH-792B

IEEE 802.3 PVC Molded LAN Transmission Assemblies— Right Angle Handled, Both Ends

49788	Male/Female	16.4	5.0	8	20 (7x28) T.C. [.76]	Individual Beldfoil overall Duofoil + braid	22 (7x30)	Datalene .020	.508	PVC .035	.889	.420	10.16
49789	Male/Female	32.8	10.0										
49790	Male/Female	65.6	20.0										
49791	Male/Female	131.2	40.0										

Light DEC Gray jacket color. Cable 9901; see Belden Master Catalog.

Contact View — **NEC** CL2 — 30V 200°C — Contact View

Molded PVC Connector PH-784B Molded PVC Connector PH-784B

IEEE 802.3 Plenum Molded LAN Transmission Assemblies— Straight Handled, Both Ends

49792	Male/Female	16.4	5.0	8	20 (7x28) T.C. [.76]	Individual Beldfoil overall Duofoil + braid	22 (7x30)	FEP Teflon .019	.483	PVDF .015	.381	.386	9.60
49793	Male/Female	32.8	10.0										
49794	Male/Female	65.6	20.0										
49795	Male/Female	131.2	40.0										

Light DEC Gray jacket color. Cable 89901; see Belden Master Catalog.

Contact View — **NEC** CMP — 30V 200°C — Contact View

Molded PVC Connector PH-792B Molded PVC Connector PH-792B

IEEE 802.3 Plenum Molded LAN Transceiver Assemblies— Right Angle, Both Ends

49796	Male/Female	16.4	5.0	8	20 (7x28) T.C. [.76]	Individual Beldfoil overall Duofoil + braid	22 (7x30)	FEP Teflon .019	.483	PVDF .015	.381	.386	9.60
49797	Male/Female	32.8	10.0										
49798	Male/Female	65.6	20.0										
49799	Male/Female	131.2	40.0										

Light DEC Gray jacket color. Cable 89901; see Belden Master Catalog.

Contact View — **NEC** CMP — 30V 200°C — Contact View

Molded PVC Connector PH-784B Molded PVC Connector PH-784B

Molded Cable Assemblies

BELDEN

SCSI Cable Assemblies

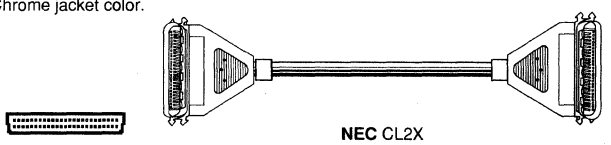
Trade No.	Gender	Length		Conductors		Shield		Insulation Material		Jacket Material		Nominal O.D.	
		ft.	m	No.	AWG (stranding) [Dia. in mm]	Type	Drain Wire	Inch	mm	Inch	mm	Inch	mm

SCSI Cable Assemblies, Straight Handles

Designed for SCSI (Small Computer Systems Interface) applications. All have 26 AWG stranded tinned copper conductors. The molded handles are 100% shielded to guard against EMI/RFI and assist in FCC compliance. These assemblies have tin-plated connectors and can be used in single-ended or differential configurations. Wiring is per SCSI standard.

49800	Male/Male	3.3	1.0	50	26 (7x34) T.C. [.48] 25 pairs	Duofoil + 90% braid	None	Poly-ethylene		PVC		.530	13.462
49801	Male/Male	6.6	2.0					.011	.279	.049	1.245		
49802	Male/Male	16.5	5.0										
49803	Male/Male	33.0	10.0										
49804	Male/Male	49.5	15.0										
49805	Male/Male	66.0	20.0										

Color code chart No. 5; refer to page BELDEN-51. Chrome jacket color. Cable RI37943; see Belden Master Catalog.



Contact View — **NEC** CL2X — Contact View

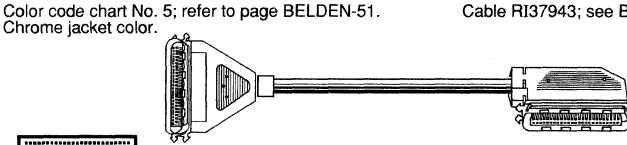
2464 300V 80°C

Molded PVC Connector PH-760B Molded PVC Connector PH-760B

SCSI Cable Assemblies, One Straight Handle, One Right Angle Handle

49810	Male/Male	3.3	1.0	50	26 (7x34) T.C. [.48] 25 pairs	Duofoil + 90% braid	None	Poly-ethylene		PVC		.530	13.462
49811	Male/Male	6.6	2.0					.011	.279	.049	1.245		
49812	Male/Male	16.5	5.0										
49813	Male/Male	33.0	10.0										
49814	Male/Male	49.5	15.0										
49815	Male/Male	66.0	20.0										

Color code chart No. 5; refer to page BELDEN-51. Chrome jacket color. Cable RI37943; see Belden Master Catalog.



Contact View — **NEC** CL2X — Contact View

2464 300V 80°C

Molded PVC Connector PH-760B Molded PVC Connector PH-831BS

Special Application

BELDEN

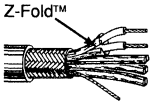
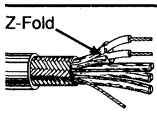
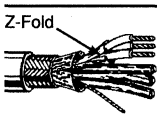
IEEE 802.3 10 Base 5

Trunk/Transceiver Coaxial Cable

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	AWG (stranding) Dia. in In. Nom. D.C.R.	No. of Shields & Material D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
1478 30V 60°C **I.E.C.Q.**[3] **Ethernet**[▲]	**9880**† **NEC** CL2 CXC FT 1	500 1000 1640	152.4 304.8 500.0	61.2 120.5 201.5	12 solid tinned copper .0855 1.42Ω/M′ 4.66Ω/km	Aluminum Polyester shield + 93% tinned copper braid + Duofoil® + 95% tinned copper braid 1.52Ω/M′ 5.0Ω/km	Cellular Polyethylene .247	6.27	.405	10.28	50	78%	26	85	1 5 10 50	.19 .37 .52 1.20	.62 1.20 1.70 3.94
							Product Description: Solid tinned copper center conductor; cellular PE insulation; foil shield, 93% tinned copper braid, Duofoil shield, 95% tinned copper braid; Yellow PVC jacket, ring-band stripes marked every 2.5 meters to aid users in tap placement.										

Ethernet[▲]

Transceiver/Drop Cable[⊗]

Description U.L. Style	Trade No. NEC Type C.S.A. Cert.	No. of Pairs	Standard Lengths ft.	Standard Lengths m	Std. Unit Lbs. ea.	Nominal D.C.R. Cond.	Nominal D.C.R. Shield	Nominal O.D. Inch	Nominal O.D. mm	Nom. Imp. (ohms)	Nom. Vel. of Prop.	Nominal Capacitance * pF/ft.	Nominal Capacitance * pF/m	Nominal Capacitance ** pF/ft.	Nominal Capacitance ** pF/m
Z-Fold™  2919 30V 80°C **Ethernet**	**9891**† **NEC** CL2 PCC FT 1	4	100 500 1000	30.4 152.4 304.8	10.6 47.2 92.4	3 Pair 22 (7x30) 14.7Ω/M′ 48.2Ω/km 1 pair 20 (7x28) 9.5Ω/M′ 31.2Ω/km	4 Beldfoil® shielded pairs + 94% braid overall 3.0Ω/M′ 10.0Ω/km	.400	10.03	78 (3 Pairs)	78	16.7	54.8	29.5	96.8
								Blue PVC jacket.		**Product Description:** Tinned copper, Datalene® insulated, twisted pairs, each pair individually shielded with Beldfoil aluminum-polyester shield (aluminum foil out), 22 AWG stranded tinned copper drain wire, 94% coverage tinned copper braid overall, Blue PVC jacket.(20 AWG pair PVC insulated.) 22 AWG Pair Color Code: Black-White, Yellow-Orange, Blue-Green. 20 AWG Pair Color Code: Gray-Purple.					
	9892† PCC FT 1	4	100 500 1000	30.4 152.4 304.8	11.0 56.3 110.9	20 (7x28) 9.3Ω/M′ 30.4Ω/km	4 Beldfoil shielded pairs + 93% braid overall 3.0Ω/M′ 10.0Ω/km	.398	10.11	78	78	16.7	54.8	29.5	96.8
								Blue PVC jacket.		(One pair PVC insulated) Color code: Black and Red. **For Plenum version, see 89892.** Color code: Gray-White, Yellow-Orange, Blue-Green.					
Z-Fold  2919 30V 80°C	**9893**† **NEC** CL2 PCC FT 1	5	100 500 1000	30.4 152.4 304.8	15.9 75.5 153.9	20 (7x28) 9.5Ω/M′ 31.2Ω/km	5 Beldfoil shielded pairs + 94% braid overall 3.0Ω/M′ 10.0Ω/km	.510	12.95	78	78	16.7	54.8	29.5	96.8
								Blue PVC jacket.		**Product Description:** Tinned copper, Datalene insulated, twisted pairs, each pair individually shielded with Beldfoil aluminum-polyester shield (aluminum foil out). 20 AWG stranded tinned copper drain wire, 94% coverage tinned copper braid overall, Blue PVC jacket. Color Code: Gray-White, Yellow-Orange, Blue-Green, Red-Brown, Red-Black.					
Z-Fold  2919 30V 80°C **Ethernet**	**9898** **NEC** CL2	1 Triplet	100 500 1000	30.4 152.4 304.8	4.9 23.5 47.5	1 Triplet 24 (7x32) 24Ω/M′ 78.7Ω/km	Beldfoil	.260	6.60	—	—	—	—	—	—
								Light Gray PVC jacket.		Pairs: Black-White, Yellow-Orange, Green-Blue.					
		3				3 Pair 28 (7x36) 65Ω/M′ 213.0Ω/km	Beldfoil on pairs + Duofoil 92% braid overall			78	66	19.7	64.6	35	113.8
										Product Description: Tinned copper, polypropylene insulated, three twisted pairs and one triplet, each individually shielded with Beldfoil aluminum polyester shield, foil out. Overall Duofoil shield with 24 AWG stranded tinned copper drain wire, 92% coverage tinned copper braid overall, Light Gray PVC jacket.					

▲ Xerox trademark.

⊗ **The 802.3 transceiver cables differ from those of Ethernet in shield arrangement. Therefore, Belden offers 9901, 9902, 9903, and 89901, which meet both 802.3 and Ethernet requirements.**

* Capacitance between conductors. **Capacitance between one conductor and other conductors connected to shield.

† Passes VW-1 Vertical Wire Flame Test.

[3] I.E.C.Q. is an international certification—the only worldwide (International Electronics Commission) certification for electronic components. Products with I.E.C.Q. designation may be used confidently by buyers throughout the world without need of further domestic testing.

Technical Information
Belden Color Code Charts

BELDEN

Color Code Chart No. 1

Cond.	Color
1st	Black
2nd	White
3rd	Red
4th	Green
5th	Brown
6th	Blue
7th	Orange
8th	Yellow
9th	Purple
10th	Gray
11th	Pink
12th	Tan

18 Gage conductors in cables 8446 through 8449 are Black and White.

Color Code Chart No. 2 and 2R (ICEA—Insulated Cable Engineers Association Standard) 2R—These cables feature a ring band striping. 2—These cables feature a spiral stripe.

Cond.	Color	Cond.	Color	Cond.	Color	Cond.	Color
1st	Black	14th	Green/White	27th	Blue/Black/White	40th	Red/White/Green
2nd	White	15th	Blue/White	28th	Black/Red/Green	41st	Green/White/Blue
3rd	Red	16th	Black/Red	29th	White/Red/Green	42nd	Orange/Red/Green
4th	Green	17th	White/Red	30th	Red/Black/Green	43rd	Blue/Red/Green
5th	Orange	18th	Orange/Red	31st	Green/Black/Orange	44th	Black/White/Blue
6th	Blue	19th	Blue/Red	32nd	Orange/Black/Green	45th	White/Black/Blue
7th	White/Black	20th	Red/Green	33rd	Blue/White/Orange	46th	Red/White/Blue
8th	Red/Black	21st	Orange/Green	34th	Black/White/Orange	47th	Green/Orange/Red
9th	Green/Black	22nd	Black/White/Red	35th	White/Red/Orange	48th	Orange/Red/Blue
10th	Orange/Black	23rd	White/Black/Red	36th	Orange/White/Blue	49th	Blue/Orange/Red
11th	Blue/Black	24th	Red/Black/White	37th	White/Red/Blue	50th	Black/Orange/Red
12th	Black/White	25th	Green/Black/White	38th	Black/White/Green		
13th	Red/White	26th	Orange/Black/White	39th	White/Black/Green		

Color Code Chart No. 3 for Paired Cables (Belden Standard)

Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination
1	Black paired with Red	11	Red paired with Yellow	21	White paired with Brown	31	Purple paired with White
2	Black paired with White	12	Red paired with Brown	22	White paired with Orange	32	Purple paired with Dark Green
3	Black paired with Green	13	Red paired with Orange	23	Blue paired with Yellow	33	Purple paired with Light Blue
4	Black paired with Blue	14	Green paired with White	24	Blue paired with Brown	34	Purple paired with Yellow
5	Black paired with Yellow	15	Green paired with Blue	25	Blue paired with Orange	35	Purple paired with Brown
6	Black paired with Brown	16	Green paired with Yellow	26	Brown paired with Yellow	36	Purple paired with Black
7	Black paired with Orange	17	Green paired with Brown	27	Brown paired with Orange	37	Gray paired with White
8	Red paired with White	18	Green paired with Orange	28	Orange paired with Yellow		
9	Red paired with Green	19	White paired with Blue	29	Purple paired with Orange		
10	Red paired with Blue	20	White paired with Yellow	30	Purple paired with Red		

Color Code Chart No. 5 for Paired Cables (Western Electric Standard)

Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination	Pair No.	Color Combination
1	White—Blue Stripe Blue—White Stripe	6	Red—Blue Stripe Blue—Red Stripe	11	Black—Blue Stripe Blue—Black Stripe	16	Yellow—Blue Stripe Blue—Yellow Stripe	21	Purple—Blue Stripe Blue—Purple Stripe
2	White—Orange Stripe Orange—White Stripe	7	Red—Orange Stripe Orange—Red Stripe	12	Black—Orange Stripe Orange—Black Stripe	17	Yellow—Orange Stripe Orange—Yellow Stripe	22	Purple—Orange Stripe Orange—Purple Stripe
3	White—Green Stripe Green—White Stripe	8	Red—Green Stripe Green—Red Stripe	13	Black—Green Stripe Green—Black Stripe	18	Yellow—Green Stripe Green—Yellow Stripe	23	Purple—Green Stripe Green—Purple Stripe
4	White—Brown Stripe Brown—White Stripe	9	Red—Brown Stripe Brown—Red Stripe	14	Black—Brown Stripe Brown—Black Stripe	19	Yellow—Brown Stripe Brown—Yellow Stripe	24	Purple—Brown Stripe Brown—Purple Stripe
5	White—Gray Stripe Gray—White Stripe	10	Red—Gray Stripe Gray—Red Stripe	15	Black—Gray Stripe Gray—Black Stripe	20	Yellow—Gray Stripe Gray—Yellow Stripe	25	Purple—Gray Stripe Gray—Purple

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

BRIM CHV CORONA RESISTANT HIGH VOLTAGE TEFLON* CABLE

BRIM CHV eliminates the need for bulky, thick insulation, as used with silicone rubber high voltage cables, and provides high temperature resistance not available with polyethylene insulated high voltage cables, plus the added benefit of retarding and detering corona discharges. Even under severe stress, including mechanical strain, moisture, corona or chemical, or high temperature conditions, there is no cracking of the insulation. Cable construction meets and exceeds MIL-W-16878D.

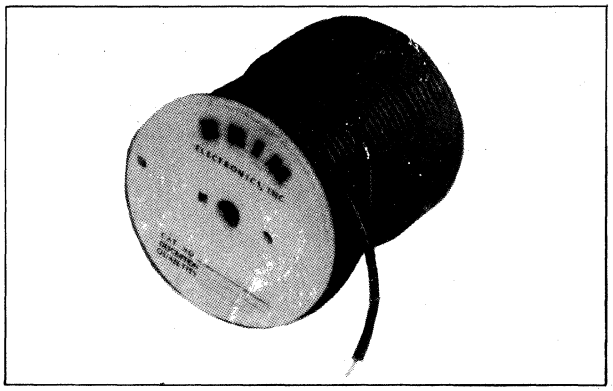
OPERATING VOLTAGE: Voltage capabilities are based on the thickness of the jacket.

OPERATING TEMPERATURE: −90°C to +250°C

DESCRIPTION: Silver plated copper conductor, per QQ-W-343, special corona retarding insulation, TFE tape wrap insulation, & a color coded jacket overall.

STD. COLORS: Red, White, Black, Green, Blue, Yellow, Orange, Brown, Purple, Gray. Stripped colors are also available.

STD. P-U: 250′, 500′, 1000′. * DuPont



Brim No.	AWG	Strand.	Volt Rating DC	Volt Rating AC	Nom. O.D.
CHV26-2	26	7/34	10000	2500	.074″
CHV26-2.5	26	7/34	12500	3800	.084″
CHV26-3	26	7/34	15000	4500	.094″
CHV26-3.5	26	7/34	17500	5400	.104″
CHV26-4	26	7/34	20000	6000	.114″
CHV26-5	26	7/34	25000	7500	.134″
CHV26-6.5	26	7/34	32500	10000	.164″
CHV26-8	26	7/34	40000	12000	.194″
CHV24-2	24	19/36	10000	2500	.080″
CHV24-2.5	24	19/36	12500	3800	.090″
CHV24-3	24	19/36	15000	4500	.100″
CHV24-3.5	24	19/36	17500	5400	.110″
CHV24-4	24	19/36	20000	6000	.120″
CHV24-5	24	19/36	25000	7500	.140″
CHV24-6.5	24	19/36	32500	10000	.170″
CHV24-8	24	19/36	40000	12000	.200″
CHV24-10	24	19/36	50000	15000	.240″
CHV22-2	22	19/34	10000	2500	.086″
CHV22-2.5	22	19/34	12500	3800	.096″
CHV22-3	22	19/34	15000	4500	.106″
CHV22-3.5	22	19/34	17500	5400	.116″
CHV22-4	22	19/34	20000	6000	.126″
CHV22-5	22	19/34	25000	7500	.146″
CHV22-6.5	22	19/34	32500	10000	.176″
CHV22-8	22	19/34	40000	12000	.206″
CHV22-10	22	19/34	50000	15000	.246″
CHV20-2	20	19/32	10000	2500	.094″
CHV20-2.5	20	19/32	12500	3800	.104″
CHV20-3	20	19/32	15000	4500	.114″
CHV20-3.5	20	19/32	17500	5400	.124″
CHV20-4	20	19/32	20000	6000	.134″
CHV20-5	20	19/32	25000	7500	.154″
CHV20-6.5	20	19/32	32500	10000	.184″
CHV20-8	20	19/32	40000	12000	.214″
CHV20-10	20	19/32	50000	15000	.254″
CHV18-2	18	19/30	10000	2500	.103″
CHV18-2.5	18	19/30	12500	3800	.113″
CHV18-3	18	19/30	15000	4500	.123″
CHV18-3.5	18	19/30	17500	5400	.133″
CHV18-4	18	19/30	20000	6000	.143″
CHV18-5	18	19/30	25000	7500	.163″
CHV18-6.5	18	19/30	32500	10000	.193″
CHV18-8	18	19/30	40000	12000	.223″
CHV18-10	18	19/30	50000	15000	.263″
CHV16-2	16	19/29	10000	2500	.109″
CHV16-2.5	16	19/29	12500	3800	.119″
CHV16-3	16	19/29	15000	4500	.129″
CHV16-3.5	16	19/29	17500	5400	.139″
CHV16-4	16	19/29	20000	6000	.149″
CHV16-5	16	19/29	25000	7500	.169″
CHV16-6.5	16	19/29	32500	10000	.199″
CHV16-8	16	19/29	40000	12000	.229″
CHV16-10	16	19/29	50000	15000	.269″
CHV14-2	14	19/27	10000	2500	.124″
CHV14-2.5	14	19/27	12500	3800	.134″
CHV14-3	14	19/27	15000	4500	.144″
CHV14-3.5	14	19/27	17500	5400	.154″
CHV14-4	14	19/27	20000	6000	.164″
CHV14-5	14	19/27	25000	7500	.184″
CHV14-6.5	14	19/27	32500	10000	.214″
CHV14-8	14	19/27	40000	12000	.244″
CHV14-10	14	19/27	50000	15000	.284″
CHV12-2	12	19/25	10000	2500	.139″
CHV12-2.5	12	19/25	12500	3800	.149″
CHV12-3	12	19/25	15000	4500	.159″
CHV12-3.5	12	19/25	17500	5400	.169″
CHV12-4	12	19/25	20000	6000	.179″
CHV12-5	12	19/25	25000	7500	.199″
CHV12-6.5	12	19/25	32500	10000	.229″
CHV12-8	12	19/25	40000	12000	.259″
CHV12-10	12	19/25	50000	15000	.299″
CHV10-2	10	37/26	10000	2500	.164″
CHV10-2.5	10	37/26	12500	3800	.174″
CHV10-3	10	37/26	15000	4500	.184″
CHV10-3.5	10	37/26	17500	5400	.194″

CONSTRUCTION VARIATIONS AVAILABLE TO ORDER.

BRIM HIGH TEMPERATURE LEAD WIRE

These small diameter high temperature lead wires allow unique constructions. The basic wire conforms to MIL-W-3861-stranded nickel plated copper; when shielded, nickel plated copper shielding is per MIL-N-46026A. Rated for 100 Volts RMS.*

Type 1: 800°F High Temperature Rating — Suitable for aircraft, or missile lead wire, heaters, furnaces, ovens and kilns for operations between 500°F to 800°F. Cond. insulation: Fiberglass braid, impregnated with a silicone varnish, over a stranded nickel plated conductor.

Type 2: 1500°F High Temperature Rating — Suitable as a radiation resistant aircraft, or missile lead wire, furnaces, ovens and kiins for operations between 800°F to 1500°F. Cond. insulation: Inorganic braid over a stranded nickel plated copper conductor.

Type 3: 2000°F High Temperature Rating — Suitable as a radiation resistant aircraft or missile lead wire for operations between 1500°F to 2000°F. Cond. Insulation: special formulated ceramic braid over a stranded nickel plated copper conductor, and a nickel plated braided shield overall.

* For dry locations.

UNSHIELDED

Brim No. Type 1	Brim No. Type 2	AWG	Strand.	Nom. O.D.	Std. P-U
2101/22	2102/22	22	19/34	.070″	500′, 1000′
2101/20	2102/20	20	19/32	.075″	500′, 1000′
2101/18	2102/18	18	19/30	.085″	500′, 1000′

SHIELDED

Brim No. Type 3	AWG	Strand.	Nom. O.D.	Std. P-U
2103/22	22	19/34	.108″	500′, 1000′
2103/20	20	19/32	.112″	500′, 1000′
2103/18	18	19/30	.122″	500′, 1000′

600 VRMS is available to order. CONSTRUCTION VARIATIONS ARE AVAILABLE TO ORDER

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792 WRITE FOR FREE CATALOG

BRIM WIRE — CABLE — TUBING — HARDWARE ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

TFE & FEP TEFLON SHIELDED CABLES • BRIMCROM • BRIMFLYX • STAINLESS STEEL TUBULAR BRAID TEFLON IMPREGNATED BRAID OVER SHIELD PER MIL-W-16878 • SHIELDED RETRACTILE CORD

DESCRIPTION: One to five twisted conductors of Type E extruded TFE* insulation (.010″ wall), over a stranded silver plated copper conductor. If shielded, braided silver plated shield with a min. coverage of 90% over the conductor(s). When jacketed, either a fused double reversed TFE tape wrap jacket, a Teflon* impregnated fiberglass braided jacket, or an extruded FEP jacket. Cables are fungus, solvent, flame, acid, alkali, and oil resistant. Rated for 600 Volts. Stranding: 26 AWG — 7 strands, 24 AWG to 16 AWG — 19 strands. Color code: 1-White, 2-Black, 3-Red, 4-Green, 5-Yellow. Jacket color: White. OPER. TEMP.: TFE −65°C to +250°C. FEP: −65°C to +200°C.

Brim No.	No. Cond.	AWG	Nom. O.D.	Brim No.	No. Cond.	AWG	Nom. O.D.
1751	1	26	.070″	1754/2	2	20	.154″
1751/2	2	26	.115″	1754/3	3	20	.163″
1752	1	24	.080″	1754/4	4	20	.179″
1752/2	2	24	.124″	1754/5	5	20	.195″
1752/3	3	24	.131″	1755	1	18	.105″
1752/4	4	24	.144″	1755/2	2	18	.172″
1752/5	5	24	.155″	1755/3	3	18	.183″
1753	1	22	.085″	1755/4	4	18	.200″
1753/2	2	22	.137″	1755/5	5	18	.222″
1753/3	3	22	.144″	1756	1	16	.114″
1753/4	4	22	.158″	1756/2	2	16	.187″
1753/5	5	22	.170″	1756/3	3	16	.200″
1754	1	20	.095″	1756/4	4	16	.220″

STD. P-U: 250′, 500′′, 1000′

TEFLON TAPE WRAP JACKET OVER SHIELD

Brim No.	No. Cond.	AWG	Nom. O.D.	Brim No.	No. Cond.	AWG	Nom. O.D.
1761	1	26	.076″	1764/2	2	20	.158″
1761/2	2	26	.119″	1764/3	3	20	.170″
1762	1	24	.084″	1764/4	4	20	.190″
1762/2	2	24	.128″	1764/5	5	20	.204″
1762/3	3	24	.135″	1765	1	18	.109″
1762/4	4	24	.155″	1765/2	2	18	.178″
1762/5	5	24	.162″	1765/3	3	18	.198″
1763	1	22	.090″	1765/4	4	18	.215″
1763/2	2	22	.142″	1765/5	5	18	.230″
1763/3	3	22	.150″	1766	1	16	.116″
1763/4	4	22	.163″	1766/2	2	16	.201″
1763/5	5	22	.183″	1766/3	3	16	.213″
1764	1	20	.099″	1766/4	4	16	.230″

STD. P-U: 250′, 500′′, 1000′

BRIMCROM™

MICROMINIATURE TEFLON* HOOK-UP WIRE

Conductors are silver plated copper dip coated with TFE Teflon* insulation. Rated for 300 Volts, −90°C to +250°C. BRIMCROM is highly flexible, chemically inert, weather resistant, nonflammable. Suitable wherever high temperatures and lack of space are absolutely critical, such as aircraft, missiles, medical, and microminiaturized electronic components, and system designs. STD. P-U: 1000′

Brim No.	AWG	Strand.	Nom. Wall	Nom. O.D.
1729/30	30	7/38	.0035″	.0188″
1729/32	32	7/40	.0030″	.0153″
1729/34	34	7/42	.0027″	.0129″
1729/36	36	7/44	.0020″	.0101″
1729/38	38	7/46	.0019″	.0086″

STD. COLORS: WHITE, RED, BLACK, GREEN. * DuPont
OTHER COLORS AVAILABLE TO ORDER. OTHER CONSTRUCTION AVAILABLE TO ORDER.

TWO AND THREE CONDUCTOR LAMINATED RIBBON CABLES USING BRIMCROM CONDUCTORS ARE AVAILABLE TO ORDER.

BRIMFLYX™ ULTRA-FLEXIBLE WIRE

DESCRIPTION: Soft bare copper conductor, insulated with a special flexible PVC formulation to minimize kinking & allow for ultra-low bending torque.

Designed for use where wires encounter continuous flexing, such as in data processing equipment, mercury thermostats, magnetic drums, and rotating servo platforms.

OPER. TEMP.: −40°C to +80°C

STD. COLORS: WHITE, BLACK, RED, GREEN. STD. P-U: 1000 FT. OTHER COLORS ARE AVAILABLE TO ORDER.

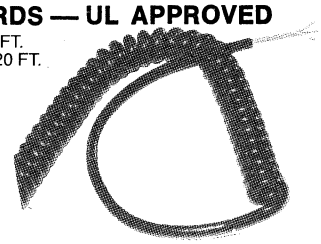
FEP TEFLON CABLES — SHIELDED — 600 VOLTS

Brim No.	No. Cond.	AWG	Strand.	Nom. O.D.	Std. P-U
1791	1	24	19/36	.087″	500′, 1000′
1791/2	2	24	19/36	.130″	500′, 1000′
1791/3	3	24	19/36	.136″	500′, 1000′
1791/4	4	24	19/36	.153″	500′, 1000′
1792	1	22	19/34	.092″	500′, 1000′
1792/2	2	22	19/34	.148″	500′, 1000′
1792/3	3	22	19/34	.155″	500′, 1000′
1792/4	4	22	19/34	.168″	500′, 1000′
1793	1	20	19/32	.100″	500′, 1000′
1793/2	2	20	19/32	.163″	500′, 1000′
1793/3	3	20	19/32	.172″	500′, 1000′
1793/4	4	20	19/32	.193″	500′, 1000′
1794	1	18	19/30	.110″	500′, 1000′
1794/2	2	18	19/30	.182″	500′, 1000′
1794/3	3	18	19/30	.200″	500′, 1000′
1794/4	4	18	19/30	.217″	500′, 1000′
1795	1	16	19/29	.118″	500′, 1000′
1795/2	2	16	19/29	.203″	500′, 1000′
1795/3	3	16	19/29	.215″	500′, 1000′
1795/4	4	16	19/29	.233″	500′, 1000′

OTHER COLOR CODES, JACKET COLORS OR CABLE CONSTRUCTIONS ARE AVAILABLE TO ORDER. * DuPont

BRIM OVERALL SHIELDED RETRACTILE COMMUNICATION CORDS — UL APPROVED

RETRACTED LENGTHS: 1, 2, 3, 4 FT.
EXTENDED LENGTHS: 5, 10, 15, 20 FT.
DESCRIPTION: 1 to 7 color coded conductors of 23 AWG 21/36 TC, spiral wrapped TC shield over the conductors, Black "BRYON" jacket overall. UL approved for 1 AMP & 300V max.
OPER. TEMP.: −20°C to +80°C.
STD. PKG.: 6



BRIM CAT. No. Retracted Lengths				No. Cond.	Nom. Coil O.D.	Nom. Cord O.D.
4 ft.	3 ft.	2 ft.	1 ft.			
135-4	135-3	135-2	135-1	1	5/8″	.175″
135/2-4	135/2-3	135/2-2	135/2-1	2	11/16″	.220″
135/3-4	135/3-3	135/3-2	135/3-1	3	3/4″	.230″
135/4-4	135/4-3	135/4-2	135/4-1	4	7/8″	.260″
135/5-4	135/5-3	135/5-2	135/5-1	5	1″	.285″
135/6-4	135/6-3	135/6-2	135/6-1	6	1 1/8″	.310″
135/7-4	—	135/7-2	135/7-1	7	1 1/4″	.340″

Brimflyx No.	AWG	Strand.	Nom. Wall	Max. Volt.	Nom. O.D.
1250/38	38	7/46	.005″	200	.015″
1250/36	36	7/44	.005″	200	.016″
1250/34	34	10/44	.005″	200	.018″
1250/32	32	18/44	.007″	300	.023″
1250/30	30	28/44	.010″	600	.031″
1250/29	29	51/46	.010″	600	.032″
1250/28	28	41/44	.010″	600	.035″
1250/27	27	48/44	.010″	600	.037″
1250/26	26	66/44	.010″	600	.042″
1250/24	24	105/44	.010″	600	.049″
1251/24	24	105/44	.015″	1000	.059″
1250/22	22	168/44	.010″	600	.054″
1251/22	22	168/44	.015″	1000	.064″
1250/20	20	259/44	.010″	600	.061″
1250/18	18	413/44	.010″	600	.072″
1250/16	16	665/44	.010″	600	.057″

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792 WRITE FOR FREE CATALOG

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

UL & CSA POWER RECTRACTILE CORDS

RETRACTED LENGTHS: 1 ft., 2 ft., 3 ft., 4ft. EXTENDED LENGTHS: 6 ft., 11 ft., 16 ft., 22 ft. BRIM retractile cords are long lasting, and useful where cords must change their length or position. Our cords will extend to approximately six times their retracted length, and will return to their original shape and length, when they are released. Retractile cords eliminate tangles, twists, knots. OPER TEMP.: −20°C to +60°C. COND. COLOR CODE: 1-Black, 2-White, 3-Red, 4-Green, 5-Orange, 6-Blue, 7-Yellow. VOLTAGE RATING: SVO SJO SVT & SJT—300V; SO & ST—600V.

NEOPRENE

BRIM CAT. NO. Retracted Lengths				No.			UL/ CSA		Nom. Coil	Nom. Cord
4 Ft.	3 Ft.	2 Ft.	1 Ft.	Cond.	Size	Strand.	Type	Amps	O.D.	O.D.
151-4	151-3	151-2	151-1	2	18	41/34	SVO	7	7/8"	.255"
151/3-4	151/3-3	151/3-2	151/3-1	3	18	41/34	SVO	7	1"	.275"
152-4	152-3	152-2	152-1	2	18	41/34	SJO	7	1 3/16"	.315"
152/3-4	152/3-3	152/3-2	152/3-1	3	18	41/34	SJO	7	1 3/8"	.345"
152/4-4	152/4-3	152/4-2	152/4-1	4	18	41/34	SJO	5.6	1 7/16"	.380"
152/5-4	—	152/5-2	—	5	18	41/34	SJO††	5.6	1 5/8"	.440"
152/7-4	—	152/7-2	—	7	18	41/34	SJO†	5	1 7/8"	.500"
152/15-4	—	—	—	15	18	41/34	SVO†	7	2 1/8"	.575"
156/3-4	156/3-3	156/3-2	156/3-1	3	18	41/34	SO	7	1 9/16"	.405"
156/4-4	156/4-3	156/4-2	156/4-1	4	18	41/34	SO	5.6	1 5/8"	.435"
156/10-4	156/10-3	156/10-2	156/10-1	10	18	41/34	SO	6	2 3/8"	.650"
153-4	153-3	153-2	153-1	2	16	65/34	SJO	10	1 3/8"	.355"
153/3-4	153/3-3	153/3-2	153/3-1	3	16	65/34	SJO	10	1 7/16"	.385"
153/4-4	153/4-3	153/4-2	153/4-1	4	16	65/34	SJO	8	1 1/2"	.445"
157/3-4	157/3-3	157/3-2	157/3-1	3	16	65/34	SO	10	1 13/16"	.470"
157/4-4	157/4-3	157/4-2	—	4	16	65/34	SO	8	1 7/8"	.500"
157/5-4	157/5-3	157/5-2	157/5-1	5	16	65/34	SO	5.6	2 1/8"	.550"
157/6-4	—	157/6-2	—	6	16	65/34	SO	8	2"	.545"
157/7-4	—	157/7-2	—	7	6/16	65/34	SO†	8	2 1/4"	.600"
					1/14	41/30		12		
154-4	154-3	154-2	154-1	2	14	41/30	SO	15	2 1/8"	.535"
154/3-4	154/3-3	154/3-2	154/3-1	3	14	41/30	SO	15	2 1/8"	.560"
154/4-4	154/4-3	154/4-2	154/4-1	4	14	41/30	SO	12	2 1/4"	.605"
154/7-4	154/7-3	154/7-2	154/7-1	7	14	41/30	SO	10	2 7/8"	.720"
155-4	—	155-2	—	2	12	65/30	SO	20	2 1/4"	.600"
155/3-4	155/3-3	155/3-2	155/3-1	3	12	65/30	SO	20	2 3/8"	.635"
155/4-4	155/4-3	155/4-2	155/4-1	4	12	65/30	SO	16	2 7/16"	.675"
155/7-4	—	155/7-2	—	7	12	65/30	SO	16	2 5/8"	.775"
158/4-4	—	—	—	4	10	104/30	SO	20	2 3/4"	.745"

PLASTIC

165-4	165-3	165-2	165-1	2	18	41/34	SVT*	7	3/4"	.250"
165/3-4	165/3-3	165/3-2	165/3-1	3	18	41/34	SVT*	7	7/8"	.260"
166-4	166-3	166-2	166-1	2	18	41/34	SJT*	7	1"	.290"
166/3-4	166/3-3	166/3-2	166/3-1	3	18	41/34	SJT*	7	1 3/8"	.325"
166/4-4	166/4-3	166/4-2	166/4-1	4	18	41/34	SJT*	5.6	1 3/8"	.350"
168-4	168-3	168-2	168-1	2	18	41/34	ST*	7	1 3/8"	.350"
168/3/4	168/3-3	168/3-2	168/3-1	3	18	41/34	ST*	7	1 7/16"	.375"
168/4-4	168/4-3	168/4-2	168/4-1	4	18	41/34	ST*	5.6	1 5/8"	.400"
167-4	167-3	167-2	167-1	2	16	65/34	SJT*	10	1 1/8"	.310"
167/3-4	167/3-3	167/3-2	167/3-1	3	16	65/34	SJT*	10	1 3/8"	.350"
167/4-4	167/4-3	167/4-2	167/4-1	4	16	65/34	SJT*	8	1 5/8"	.410"
169-4	169-3	169-2	169-1	2	16	65/34	ST*	10	1 3/8"	.375"
169/3-4	169/3-3	169/3-2	169/3-1	3	16	65/34	ST*	10	1 5/8"	.390"
169/4-4	169/4-3	169/4-2	169/4-1	4	16	65/34	ST*	8	1 5/8"	.430"

STD. PKG.: 6 When UL Type show, cord is also CSA Approved.
Other Constructions available to order. † Non-UL †† Non-CSA *UL only

RETRACTILE COMMUNICATION CORDS

UL APPROVED RETRACTED LENGTHS: 1, 2, 3, 4 ft.

EXTENDED LENGTHS: 6, 11, 16, and 22 ft. OPER. TEMP.: −20C to +80°C

DESCRIPTION: Cords are composed of multicond. 23 AWG 21/36 tinned soft copper for a longer flex life. Cords are jacketed in either TPR, or special vinyl-"Byron"-formulation, for a long service life. These cords are suitable for communication equipment, such as ham operations, head sets, radio equipment, telephone car carriers, etc. 300V working. 1 AMP carrying capacity. Nom. cond. resistance .022 ohms per linear foot, .185 ohms per retracted foot.
† Stocked in Bryon only. STD. PKG.: 6

BRIM CAT. NO. Retracted Lengths				No.	Nom. Coil	Nom. Cord
4 Ft.	3 Ft.†	2 Ft.†	1 Ft.	Cond.	O.D.	O.D.
132-4	132-3	132-2	132-1	2	5/8"	.210"
132/3-4	132/3-3	132/3-2	132/3-1	3	3/4"	.220"
132/4-4	132/4-3	132/4-2	132/4-1	4	7/8"	.250"
132/5-4	132/5-3	132/5-2	132/5-1	5	1"	.275"
132/6-4	132/6-3	132/6-2	132/6-1	6	1 1/8"	.300"
132/7-4	132/7-3	132/7-2	132/7-1	7	1 1/4"	.310"
132/8-4	132/8-3	132/8-2	132/8-1	8	1 1/4"	.340"
132/10-4	132/10-3	132/10-2	132/10-1	10	1 3/8"	.380"
132/12-4	132/12-3	132/12-2	132/12-1	12	1 1/2"	.390"
132/15-4	132/15-3	132/15-2	132/15-1	15	1 5/8"	.400"

COND. COLOR CODE: 1-Black, 2-White, 3-Red, 4-Green, 5-Orange, 6-Blue, 7-Yellow, 8-Brown, 9-Wh/Blk., 10-Red/Blk., 11-Green/Blk., 12-Orange/Blk., 13-Blue/Blk., 14-Yel./Blk., 15-Red/Wh.

UL APPROVED RETRACTILE POWER CORD SETS RETRACTED: 18". EXTENDS TO APPX.: 9 ft.

300V

SVT and SJT Plastic, SVO and SJO Neoprene jacketed cord sets with a molded plug on one end, other end, jacket stripped and cond. exposed for easy temination. For mobile office equipment and tools.
OPER. TEMP.: −20°C to +60°C STD. PKG.: 6

Brim No.	No. Cond.	AWG	Strand.	UL Ty.	Coil O.D.	Cord O.D.
120/3	3	18	41/34	SVO	1"	.275"
121/3	3	18	41/34	SJO	1 3/8"	.345"
122/3	3	16	65/34	SJO	1 7/16"	.385"
123/3	3	18	41/34	SVT	7/8"	.260"
124/3	3	18	41/34	SJT	1 3/8"	.330"

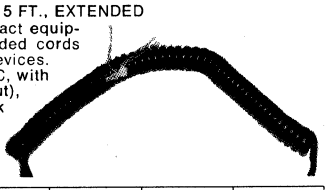
BRIM MINIATURE COMMUNICATION CORDS - UL

RETRACTED: 1, 2 & 4 ft. EXTENDED: 5, 10 & 20 ft. Miniature in size. Suitable for compact equipment. All cond. 28 AWG 19/40 T.C. ½ AMP rating. Black "Bryon" jacket overall.† OPER. TEMP.: −20°C to +60°C. STD. PKG.: 6

BRIM CAT. NO. Retracted Lengths			No.		Cond.	Nom. Coil	Nom. Cord
4 ft. +	2 ft.	1 ft. +	Cond.	AWG	Strand	O.D.	O.D.
118-4‡	118-2†‡	118-1‡	2	28	19/40	1/2"	.150"
118/3-4‡	118/3-2†‡	118/3-1‡	3	28	19/40	1/2"	.160"
119-4‡	119-2†‡	119-1‡	4	28	19/40	1/2"	.170"
124-4‡	125-2†‡	125-1‡	5	28	19/40	9/16"	.180"
125/6-4‡	125/6-2†‡	125/6-1‡	6	28	19/40	9/16"	.190"
125/7-4‡	125/7-2†‡	125/7-1‡	7	28	19/40	5/8"	.200"
126-4‡	126-2†‡	126-1‡	8	28	19/40	3/4"	.220"
—	127-2	—	9	28	19/40	3/4"	.230"
—	127/10-2	—	10	28	19/40	3/4"	.240"
—	127/11-2	—	11	28	19/40	3/4"	.250"
—	127/12-2	—	12	28	19/40	7/8"	.260"
—	127/13-2	—	13	28	19/40	7/8"	.270"
—	127/15-2	—	15	28	19/40	1"	.280"
—	127/17-2*	—	17	28	19/40	1"	.290"

*STD PKG.: 12 † Also available in TPE insulation; cable O.D. slightly larger.
‡ PVC Constructions are UL approved.

BRIM MINIATURE SHIELDED COMMUNICATION CORDS 1 FT. RETRACTED FOR 5 FT., EXTENDED



Miniature in size. Suitable for compact equipment, such as FCC †required shielded cords for computers or other interfaced devices. All conductors are 28 AWG 19/40 TC, with an aluminum mylar foil shield (foil out), a spiral TC shield, & then a Black Byron VW-1 vinyl jacket overall. 18" & 2" straight ends, cut blunt. Long lasting.
OPER. TEMP.: −20° to +60°C

BRIM No.	Cord Length	No. of Cond.	AWG	Cond. Strand	Coil O.D.	Cord O.D.
170/2-1*	1 Ft.	2	28	19.40	19/32"	.170"
170/4-1*	1 Ft.	4	28	19/40	21/32"	.175"
170/5-1*	1 Ft.	5	28	19/40	23/32"	.180"
170/6-1	1 Ft.	6	28	19/40	3/4"	.185"
170/7-1*	1 Ft.	7	28	19/40	25/32"	.190"
170/8-1	1 Ft.	8	28	19/40	13/16"	.195"
170/9-1	1 Ft.	9	28	19/40	7/8"	.200"
170/10-1*	1 Ft.	10	28	19/40	7/8"	.210"

MODULAR PLUGS ARE AVAILABLE FOR SOME OF THESE CABLES.
STD. PKG.: 25 *STD. PKG.: 6 †FCC DOCKET NO. 20780.

RETRACTILE TEST LEAD WIRE: 1 FT. & 2 FT.

Stretch these coiled test lead wire/cords repeatedly without fear of kinks. 1 ft. extends to appx. 6 ft., 2 ft. to appx. 12 ft. One cond. 20 AWG flexible stranded soft T.C., TPR insulation, for 1000V, 4 AMPS working. STD. COLORS: Black, Red. OPER. TEMP.: −20°C to +60°C.

Brim No.	Cord Lgth.	AWG	Strand.	Nom. Coil O.D.	Nom. Cond. O.D.
114T	12"	20	41/36	5/16"	.165"
115T	24"	20	41/36	5/16"	.165"

STD. PKG.: 6 PVC test lead wire available to order.

SHIELDED RETRACTILE COMMUNICATION CORDS

RETRACTED LENGTHS: 1, 2 and 4 ft.
EXTENDED LENGTHS: 6, 11 and 22 ft.

DESCRIPTION: Single and multi-cond. spiral shielded communication cables, jacketed in TPR or "Bryon" plastic. Shielded conductors are individually shielded. Shield can be pigtailed for soldering. Safe and reliable as a mike cord.
OPER. TEMP.: −20°C to +80°C.

BRIM CAT. NO. Retracted Lengths			No.			Nom. Coil	Nom. Cord	Volt.	Capacitance MMF/Ft.	
4 Ft.	2 Ft.†	1 Ft.†	Cond.	Size	Strand.	O.D.	O.D.	Rating	Linear	Ret'rd
146-4T	—	—	1	23	21/36	1/2"	.160"	300	56	440
143-4	143-2	143-1	3	2-23 23(S)	21/36	7/8"	.250"††	300	56	450
144-4T	—	—	2	23(S)*	21/36	7/8"	.250"	300	56	450
145-4	145-2	145-1	4	2-23 4 2-23(S)*	21/36	1 1/8"	.290"	300	56	450
147-4T	147-2T	147-1T	2	23(S)**	21/36	7/8"	.250"	300	56	450

*Individual conductors are shielded and jacketed. †Stocked in Bryon only. STD. PKG.: 6
**Individually shielded only. ††The nom. coil and cord. O.D.'s for TPR cables are slightly smaller.

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792

WRITE FOR FREE CATALOG

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886
BRIM MINIATURE CABLES • COMMERCIAL RG59/U CABLE

BRIM COMMERCIAL RG 59/U CO-AX

DESCRIPTION: A type RG 59/U construction, composed of 22(1) bare Copperweld, .055″ wall of cellular Polyethylene dielectric, 4x28 AWG drain wires over an Aluminum Polypropylene tape shield, for 100% coverage, and a Black* PVC jacket overall. MAX. OPER. VOLTAGE: 500V RMS. Dielectric Strength: 1000V RMS. OPER. TEMP.: 80°C
STD. P-U: 1000′

ATTENUATION RATINGS FOR BC-59/U

83 MHz CH. 6	211 MHz CH. 13
2.3	4.0

BRIM No.	AWG	% of Shield	Nom. Imp.	Nom. Vel. of Prop.	Nom. Cap. Pf/ft.	Wall Thick.	Jck. Thick.	Nom. O.D.
BC-59/U	22(1)	100%	75 Ohms	81%	17	.058″	.042″	.242″

HI-FI STEREO CABLE

DESCRIPTION: Stranded tinned copper conductors, special soft PVC insulation, twisted, shielded or unshielded. Designed for low hum & noise pickup. Very flexible.
OPER. VOLTAGE: 200V OPER. TEMP.: −40°C to +80°C.

BRIM No.	Cond.	AWG	Strand.	Nom. Wall	Nom. O.D.
UNSHIELDED					
1542	2	32	7/40	.010″	.047″
1543	3	32	7/40	.010″	.053″
1544	4	32	7/40	.010″	.061″
SHIELDED					
1545	1	32	7/40	.010″	.040″
1546	2	32	7/40	.010″	.067″
1547	3	32	7/40	.010″	.073″
1548	4	32	7/40	.010″	.081″
1551*	2	32	7/40	.010″	.080″

STD. P-U: 500′, 1000′ * Individually shielded.
COLOR CODE: 1-White, 2-Red, 3-Black, 4-Green.

MINIATURE UNSHIELDED HI-FI & STEREO CABLE

DESCRIPTION: 2 to 4 conductors of MIL-W-16878D Type B, twisted, no jacket.
OPERATING VOLTAGE: 600V.
OPERATING TEMPERATURE: −55°C to +105°C.

BRIM No.	AWG	Cond.	Strand.	Wall	Nom. O.D.
1605/2	30	2	7/38	.010″	.058″
1605/3	30	3	7/38	.010″	.064″
1605/4	30	4	7/38	.010″	.072″

STD. P-U: 500′, 1000′. COLOR CODE: 1-Black, 2-White, 3-Red, 4-Green.

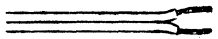
MINIATURE CABLES — SHIELDED, UNSHIELDED, JACKETED, UNJACKETED 105°C—600V.

DESCRIPTION: 2 to 4 conductors of MIL-W-16878D Type B, twisted, shielded or unshielded, jacketed or unjacketed.

BRIM No.	AWG	No. Cond.	Strand	Nom. Wall	Nom. O.D.
UNSHIELDED, CLEAR PVC JACKET					
1610/2	28	2	7/36	.010″	.090″
1610/3	28	3	7/36	.010″	.096″
1610/4	28	4	7/36	.010″	.105″
SHIELDED, UNJACKETED					
1615/2	28	2	7/36	.010″	.093″
1615/3	28	3	7/36	.010″	.099″
1615/4	28	4	7/36	.010″	.108″
SHIELDED, CLEAR PVC JACKET					
1618/2	28	2	7/36	.010″	.113″
1618/3	28	3	7/36	.010″	.119″
1618/4	28	4	7/36	.010″	.128″

STD. P-U: 500′, 1000′
COLOR CODE: 1-Black, 2-White, 3-Red, 4-Green.

MINIATURE ZIP CORD

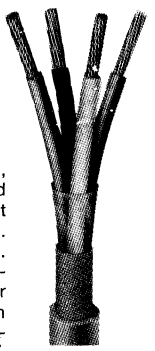


DESCRIPTION: 2 conductors of 28 AWG stranded tinned copper, insulated with 80°C PVC, extruded into a parallel or miniature zip cord. Polarity identification.

BRIM No.	AWG	Strand.	Cond.	Nom. O.D.	STD. P-U
1528	28	7/36	2	.040 x .082″	1000′
1529	29	16/40	2	.040 x .082″	1000′

STD. COLORS: White, Black.

MINIATURE SHIELDED CONTROL AND INSTRUMENTATION CABLES — 600V 105°C MIL-W-16878D TYPE B



DESCRIPTION: Stranded tinned copper conductors, .010″ wall PVC, cabled, mylar binder, braided tinned copper shield, 90% min. coverage, gray PVC jacket overall. All material pass UL VW-1 test. OPER. VOLT.: 600 Volts. OPER. TEMP.: −55°C to +105°C. PVC is resistant to acid, fungus, oils, moisture, solvents, flame. Used as an interconnecting cable for electronic equipment, control and instrumentation cable telemetry and remote control cable for sensitive recording instruments. STD. P-U: 500′, 1000′.

Brim No.	Conductor No.	Conductor AWG	Conductor Strand.	Nom. Wall	Nom. Jck.	Nom. O.D.
1202/2	2	B-28	7/36	.010″	.010″	.115″
1202/3	3	B-28	7/36	.010″	.012″	.125″
1202/4	4	B-28	7/36	.010″	.012″	.135″
1202/6	6	B-28	7/36	.010″	.015″	.160″
1202/8	8	B-28	7/36	.010″	.015″	.175″
1202/10	10	B-28	7/36	.010″	.018″	.210″
1202/12	12	B-28	7/36	.010″	.018″	.215″
1202/15	15	B-28	7/36	.010″	.020″	.230″
1202/20	20	B-28	7/36	.010″	.022″	.245″
1202/25	25	B-28	7/36	.010″	.025″	.270″
1202/30	30	B-28	7/36	.010″	.028″	.301″

COLOR CODE: 1-White, 2-Black, 3-Red, 4-Green, 5-Orange, 6-Lt. Blue, 7-Wh/Black, 8-Red/Black, 9-Green/Blk, 10-Orange/Blk, 11-Blue/Blk, 12-Black/Wh, 13-Red/Wh, 14-Green/Wh, 15-Blue/Wh, 16-Black/Red, 17-White/Red, 18-Orange/Red, 19-Blue/Red, 20-Red/Green, 21-Org./Green, 22-Blk/Wh/Red, 23-Wh/Blk/Red, 24-Red/Blk/Wh, 25-Grn/Blk/Wh, 26-Org/Blk/Wh, 27-Blu/Blk/Wh, 28-Blk/Red/Grn, 29-Wh/Red/Grn, 30-Red/Blk/Grn.

BRIM MINIFLYX™ SUBMINIATURE ULTRA-FLEXIBLE INSTRUMENTATION CABLES

DESCRIPTION: Ultra-flexible stranded bare copper conductors, .005″ wall of soft flexible PVC, braided shield, White .010″ soft flexible PVC jacket overall. Suitable as an instrumentation cable where Ultra-flexibility & subminiaturization are essential, in low voltage applications. For example: biomedical instruments, missiles, computer, miniature relays, disc drives, servo systems, recorders.
OPERATING TEMPERATURE: −40°C to +90°C.
OPERATING VOLTAGE: 200 Volts.

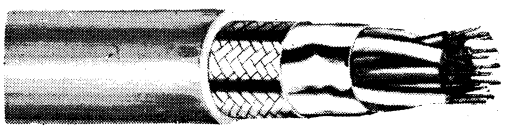
BRIM No.	No. Cond.	AWG	Strand.	Nom. Wall	Nom. Jck.	Nom. O.D.	Std. P-U
1210/2	2	30	40/46	.005″	.010″	.073″	1000′
1210/3	3	30	40/46	.005″	.010″	.076″	1000′
1210/4	4	30	40/46	.005″	.010″	.082″	1000′
1210/5	5	30	40/46	.005″	.010″	.088″	1000′
1211/2	2	32	65/50	.005″	.010″	.069″	1000′
1211/3	3	32	65/50	.005″	.010″	.072″	1000′
1211/4	4	32	65/50	.005″	.010″	.077″	1000′
1211/5	5	32	65/50	.005″	.010″	.083″	1000′
1212/2	2	34	40/50	.005″	.010″	.065″	1000′
1212/3	3	34	40/50	.005″	.010″	.068″	1000′
1212/4	4	34	40/50	.005″	.010″	.072″	1000′
1212/5	5	34	40/50	.005″	.010″	.078″	1000′
1213/2	2	36	25/50	.005″	.010″	.061″	1000′
1213/3	3	36	25/50	.005″	.010″	.063″	1000′
1213/4	4	36	25/50	.005″	.010″	.068″	1000′
1213/5	5	36	25/50	.005″	.010″	.072″	1000′
1214/2	2	38	16/50	.005″	.010″	.057″	1000′
1214/3	3	38	16/50	.005″	.010″	.059″	1000′
1214/4	4	38	16/50	.005″	.010″	.063″	1000′
1214/5	5	38	16/50	.005″	.010″	.067″	1000′

COLOR CODE: 1-White, 2-Black, 3-Red, 4-Green, 5-Yellow.

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

BRAIDED TC SHIELDED CONTROL — INSTRUMENTATION — MICROPHONE CABLES

UL SHIELDED COMPUTER AND CONTROL CABLES

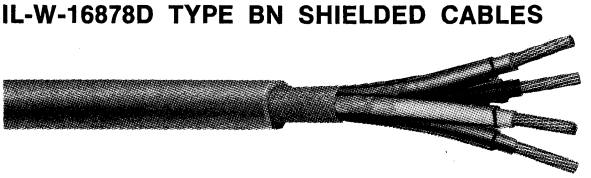


DESCRIPTION: Each conductor UL Type 1061, 24 AWG 7/32 T.C., UL VW-1. Conductors are paired, cabled, mylar wrap, braided tinned copper shield, chrome PVC jacket overall. Color coded. Shielding coverage a minimum of 85%. Cable meets UL Styles 2343 & 2344. Suitable as a control cable, computer cable, shielded audio cable. OPERATING VOLTAGE: 300V UL. OPERATING TEMPERATURE: −40°C to +80°C. STD. P-U: 500′, 1000′.

Brim No.	No. of Pairs	AWG	Strand.	Nom. Wall	Nom. Jack.	Nom. O.D.
1886/5	5	24	7/32	.009″	.062″	.355″
1886/7	7	24	7/32	.009″	.062″	.375″
1886/12	12	24	7/32	.009″	.062″	.460″
1886/15	15	24	7/32	.009″	.062″	.510″
1886/19	19	24	7/32	.009″	.062″	.530″
1886/27	27	24	7/32	.009″	.062″	.620″
1886/37	37	24	7/32	.009″	.062″	.690″
1886/48	48	24	7/32	.009″	.062″	.775″
1886/60	60	24	7/32	.009″	.062″	.845″

See color code for paired cables.
OTHER CONSTRUCTIONS AVAILABLE TO ORDER.

MIL-W-16878D TYPE BN SHIELDED CABLES

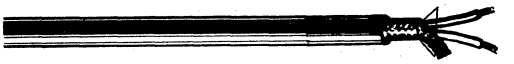


DESCRIPTION: One to four conductors, stranded tinned copper, Tyne BN insulation — .010″ wall PVC, clear nylon jacket — conductors are cabled, braided tinned copper shield, white PVC jacket overall. Cable components meet UL VW-1 vertical flame test requirements, and is resistant to oils, acids, solvents, alkalis, moisture, fungus. OPERATING VOLTAGE: 600V. OPERATING TEMPERATURE: −55°C to +105°C. STD. P-U: 500′, 1000′.

Brim No.	No. Cond.	AWG-Strand.	PVC Wall	Nylon Jack.	Nom. Jack.	Nom. O.D.
1450	1	26-7/34	.010″	.003″	.010″	.087″
1450/2	2	26-7/34	.010″	.003″	.014″	.138″
1450/3	3	26-7/34	.010″	.003″	.014″	.142″
1450/4	4	26-7/34	.010″	.003″	.016″	.162″
1451	1	24-19/36	.010″	.003″	.010″	.092″
1451/2	2	24-19/36	.010″	.003″	.016″	.155″
1451/3	3	24-19/36	.010″	.003″	.016″	.162″
1451/4	4	24-19/36	.010″	.003″	.017″	.172″
1452	1	22-19/34	.010″	.003″	.010″	.100″
1452/2	2	22-19/34	.010″	.003″	.016″	.170″
1452/3	3	22-19/34	.010″	.003″	.016″	.180″
1452/4	4	22-19/34	.010″	.003″	.019″	.194″
1453	1	20-19/32	.010″	.003″	.010″	.108″
1453/2	2	20-19/32	.010″	.003″	.019″	.190″
1453/3	3	20-19/32	.010″	.003″	.019″	.200″
1453/4	4	20-19/32	.010″	.003″	.021″	.216″
1454	1	18-19/30	.010″	.003″	.012″	.122″
1454/2	2	18-19/30	.010″	.003″	.021″	.210″
1454/3	3	18-19/30	.010″	.003″	.021″	.225″
1454/4	4	18-19/30	.010″	.003″	.023″	.250″
1455	1	16-19/29	.010″	.003″	.016″	.137″
1455/2	2	16-19/29	.010″	.003″	.023″	.236″
1455/3	3	16-19/29	.010″	.003″	.023″	.242″
1455/4	4	16-19/29	.010″	.003″	.025″	.267″
1456	1	14-19/27	.010″	.004″	.020″	.150″
1456/2	2	14-19/27	.010″	.004″	.027″	.266″

COLOR CODE: 1-White, 2-Black, 3-Red, 4-Green.

SHIELDED MICROPHONE CABLE



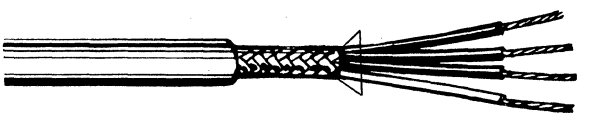
DESCRIPTION: 2 Cond. stranded tinned copper .016″ wall polyethylene, fillers, mylar wrap, tinned copper shield, .030″ Hi-gloss Black PVC jacket overall. OPER. VOLT.: 1000V.

COLOR CODE: 1-Black, 2-Red.

OPERATING TEMPERATURE: −20°C to +80°C. Nom. Cap./ft. between one cond. remaining cond. connected to shield: 1884/24—38MMF, 1884/22 — 31MMF.

BRIM No.	No. Cond.	AWG-Strand	Shield	Nom. Wall	Nom. O.D.
1884/24	2	24-10/34	Spiral	.016″	.190″
1884/22	2	22-16/34	Braid	.025″	.240″

MICROPHONE — REMOTE-CONTROL CABLE



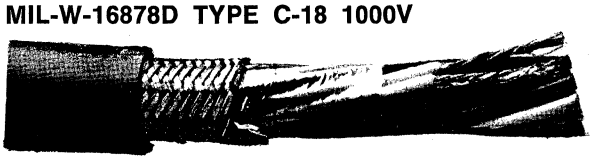
DESCRIPTION: Each conductor stranded TC .014″ wall polyethylene, cabled with fillers, mylar wrap, braided TC shield, chrome PVC jacket overall. OPER. VOLT.: 1000V.

OPERATING TEMPERATURE: −20°C to +80°C.

BRIM No.	No. Cond.	AWG	Strand	Nom. Wall	Nom. Jack.	Nom. O.D.
1883/2	2	20	26/34	.014″	.030″	.245″
1883/3	3	20	26/34	.014″	.035″	.250″
1883/4	4	20	26/34	.014″	.035″	.260″
1883/5	5	20	26/34	.014″	.035″	.275″
1883/6	6	20	26/34	.014″	.035″	.295″
1883/8	8	20	26/34	.014″	.035″	.325″
1883/10	10	20	26/34	.014″	.035″	.370″
1883/12	12	20	26/34	.014″	.035″	.380″
1883/15	15	20	26/34	.014″	.035″	.405″
1883/20	20	20	26/34	.014″	.035″	.445″

STD. P-U: 500′, 1000′

HEAVY DUTY SHIELDED CONTROL CABLES MIL-W-16878D TYPE C-18 1000V



DESCRIPTION: MIL-W-16878D Ty C-18, 19/30 TC conductors, twisted, mylar wrap braided tinned copper shield — 90% minimum coverage — chrome PVC jacket overall. Color coded. Cable resistant to acids, oils, moisture, solvents, alkalis, fungus. Cable meets UL VW-1 vertical flame test requirements. OPERATING VOLTAGE: 1000V. OPERATING TEMPERATURE: −55°C to +105°C. Suitable as an interconnecting cable for electronic equipment, instrumentation, control, telemetry data, and remote control of sensitive recording instruments.
STD. P-U: 500′, 1000′.

Brim No.	No. Cond.	AWG	Strand.	Nom. Wall	Nom. Jack.	Nom. O.D.
3019/5	5	C-18	19/30	.016″	.025″	.302″
3019/10	10	C-18	19/30	.016″	.035″	.407″
3019/15	15	C-18	19/30	.016″	.040″	.472″
3019/20	20	C-18	19/30	.016″	.045″	.531″
3019/30	30	C-18	19/30	.016″	.055″	.651″

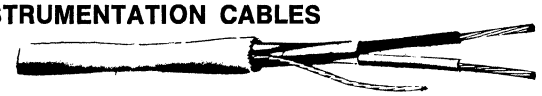
OTHER CONSTRUCTIONS AVAILABLE TO ORDER.

COLOR CODE FOR 3019 SERIES: 1-Black, 2-White, 3-Red, 4-Green, 5-Orange, 6-Blue, 7-White/Black, 8-Red/Black, 9-Green/Black, 10-Orange/Black, 11-Blue/Black, 12-Black/White, 13-Red/White, 14-Green/White, 15-Blue/White, 16-Black/Red, 17-White/Red, 18-Orange/Red, 19-Blue/Red, 20-Red/Green, 21-Orange/Green, 22-Black/White/Red, 23-White/Black/Red, 24-Red/Black/White, 25-Green/Black/White, 26-Orange/Black/White, 27-Blue/Black/White, 28-Black/Red/Green, 29-White/Red/Green, 30-Red/Black/Green.

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

ALUMINUM MYLAR FOIL SHIELDED CABLES

ALUMINUM MYLAR FOIL SHIELDED CABLE — INSTRUMENTATION CABLES

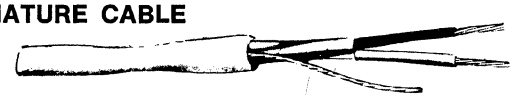


DESCRIPTION: Stranded TC conductors, polyethylene insulation, conductors twisted, an aluminum mylar foil shield, foil out, TC drain wire, gray PVC jacket overall. Color coded. Suitable as a light weight shielded instrumentation cable. Shield provides 100% coverage, and drain wire provides quick and easy grounding. OPERATING VOLTAGE: 400V.
OPERATING TEMPERATURE: −20°C to +60°C.
COLOR CODE 1-Black, 2-Red, 3-White, 4-Green.

BRIM No.	No. Cond.	AWG	Strand	Nom. Wall	Nom. Jck.	Nom. O.D.
1639	2	24	7/32	.015″	.020″	.155″
1639/3	3	24	7/32	.015″	.020″	.172″
1639/4	4	24	7/32	.015″	.020″	.195″
1640	2	22	7/30	.015″	.020″	.165″
1640/3	3	22	7/30	.015″	.020″	.182″
1640/4	4	22	7/30	.015″	.020″	.205″
1641	2	20	10/30	.015″	.020″	.184″
1641/3	3	20	10/30	.015″	.020″	.202″
1641/4	4	20	10/30	.015″	.020″	.221″
1642	2	18	16/30	.017″	.020″	.215″
1642/3	3	18	16/30	.017″	.020″	.233″
1642/4	4	18	16/30	.017″	.020″	.258″
1643	2	16	26/30	.017″	.020″	.250″
1643/3	3	16	26/30	.017″	.020″	.273″
1644	2	14	41/30	.017″	.025″	.295″
1644/3	3	14	41/30	.017″	.025″	.315″

STD. P-U: 500′, 1000′

ALUMINUM MYLAR FOIL SHIELDED CABLES — MINIATURE CABLE



DESCRIPTION: 2 conductors 22 AWG SOLID or STRANDED TC, .008″ wall of polypropylene, aluminum mylar foil shield, foil out, TC drain wire, chrome PVC jacket overall. Suitable for miniature instrumentation.
OPERATING VOLTAGE: 200V.
OPERATING TEMPERATURE: −40°C to +105°C.
COLOR CODE: 1-Red, 2-Black, 3-White, 4-Green.

BRIM No.	No. Cond.	AWG	Strand	Nom. Wall	Nom. Jck.	Nom. O.D.
1636	2	22	1	.008″	.018″	.117″
1637	2	22	7/30	.008″	.020″	.134″
1637/2*	4	22	7/30	.008″	.020″	.165″

STD. P-U: 500′, 1000′
* Common drain wire, and common axis.

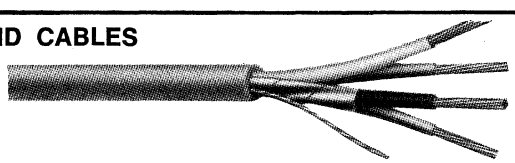
MULTIPLE PAIRED COMMUNICATION CABLES

DESCRIPTION: 22 AWG SOLID TC conductors, .008″ wall polypropylene, or .010″ wall PVC, color coded, conductors are twisted into pairs, the pairs are cabled, an aluminum mylar foil shield over all pairs, foil out, a stranded TC drain wire, chrome PVC jacket overall. Suitable for communication telephone and sound systems, control and instrumentation cable. OPERATING VOLTAGE: 200V. OPERATING TEMPERATURE: −40°C to +105°C.

BRIM NO.	NO. PAIRS	AWG	INSULA.	NOM. WALL	NOM. JCK.	NOM. O.D.
1633/38	38	22-1	Polyprop.	.008″	.045″	.575″
1633/51	51	22-1	PVC	.010″	.050″	.686″

STD. P-U: 500′, 1000′ **SEE FIGURE 1**

SOUND CABLES



DESCRIPTION: Four conductors, stranded TC, .009″ wall polypropylene, two conductors inside an aluminum mylar foil shield, foil out, a stranded TC drain wire and two conductors outside of shield, chrome PVC jacket overall. Polypropylene insulation is used because of its mechanical toughness and excellent high frequency properties. OPERATING VOLTAGE: 300V. OPERATING TEMPERATURE: −40°C to +105°C. COLOR CODE: Shielded: 1-Black, 2-Red. Unshielded: 3-Green, 4-White.

Brim No.	No. Cond.	AWG/ Strand.	No. Shld.	Nom. Wall	Nom. Jck.	Nom. O.D.
1620/4	4	20-7/28	2	.009″	.020″	.185″
1622/4	4	22-7/30	2	.009″	.020″	.167″
1624/4	4	24-7/32	2	.009″	.020″	.150″

STD. P-U: 500′, 1000′.

ALUMINUM MYLAR FOIL SHIELDED CABLES

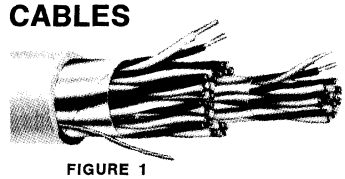


FIGURE 1

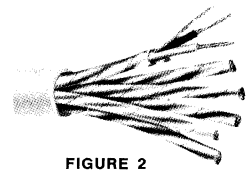


FIGURE 2

INDIVIDUALLY SHIELDED PAIRS — 22 and 18 AWG — POLYETHYLENE

DESCRIPTION: 22 AWG 7/30 TC or 18 AWG 16/30 TC, wall of polyethylene insulated conductors, conductors are twisted into pairs, an aluminum mylar foil shield with a stranded TC drain wire over each pair, the shielded pairs are cabled, chrome PVC jacket overall. Color coded. Nom. Cap. between conductors: 25PF/Ft. Nom. Cap. between one conductor and remaining conductor connected to shield: 45PF/Ft. Suitable for audio, R.F. data and pulse applications requiring superior circuit isolation.
OPERATING VOLTAGE: 300V.
OPERATING TEMPERATURE: −20°C to +60°C.

22 AWG 7/30

Brim No.	No. Pairs	No. Cond.	Nom. Wall	Nom. Jck.	Nom. O.D.
1630/3	3	6	.010″	.025″	.255″
1630/6	6	12	.010″	.030″	.345″
1630/9	9	18	.010″	.035″	.410″
1630/11	11	22	.010″	.040″	.460″
1630/15	15	30	.010″	.045″	.535″
1630/19	19	38	.010″	.050″	.575″
1630/27	27	54	.010″	.055″	.690″

18 AWG 16/30

Brim No.	No. Pairs	No. Cond.	Nom. Wall	Nom. Jck.	Nom. O.D.
1632/3	3	6	.016″	.035″	.375″
1632/6	6	12	.016″	.045″	.555″
1632/9	9	19	.016″	.055″	.620″
1632/11	11	22	.016″	.060″	.745″
1632/15	15	30	.016″	.065″	.820″
1632/19	19	38	.016″	.075″	.870″
1632/27	27	54	.016″	.085″	.995″

STD. P-U: 500′, 1000′. CONSTRUCTION VARIATIONS TO ORDER.
SEE FIGURE 2

INDIVIDUALLY SHIELDED PAIRS — 22 AWG STRANDED — POLYPROPYLENE

DESCRIPTION: 22 AWG 7/30 TC conductors, .010″ wall polypropylene, conductors are twisted into pairs, pairs are cabled, an aluminum mylar foil shield with a stranded TC drain wire over each twisted pair, chrome PVC jacket overall. Jacket passes UL VW-1 vertical flame test. For audio, pulse, data, and RF applications requiring superior circuit isolation. Polypropylene is used for its mechanical toughness and high frequency properties. OPER. VOLT.: 300V. OPER. TEMP.:− 55°C to +105°C. STD. P-U: 500′, 1000′.

Brim No.	No. Pairs	No. Cond.	Strand.	Nom. Wall	Nom. Jck.	Nom. O.D.
1638/3	3	6	7/30	.010″	.025″	.250″
1638/6	6	12	7/30	.010″	.030″	.340″
1638/9	9	18	7/30	.010″	.035″	.405″
1638/11	11	22	7/30	.010″	.040″	.455″
1638/15	15	30	7/30	.010″	.045″	.530″
1638/19	19	38	7/30	.010″	.050″	.570″
1638/27	27	54	7/30	.010″	.055″	.685″

SEE FIGURE 2

INDIVIDUALLY SHIELDED PAIRS — 22 AWG SOLID

DESCRIPTION: 22 AWG SOLID T.C. conductors, .013″ wall PVC, conductors are twisted into pairs, an aluminum mylar foil shield with a TC drain wire over each pair, the pairs are cabled, chrome PVC jacket overall. Color coded. Suitable for audio, pulse, R.F., data applications requiring superior circuit isolation. OPER. VOLT.: 300V. OPERATING TEMPERATURE: −20°C to +60°C. **SEE FIGURE 2**

Brim No.	No. Pairs	No. Cond.	AWG/ Strand.	Nom. Wall	Nom. Jck.	Nom. O.D.
1635/3	3	6	22-1	.013″	.035″	.275″
1635/6	6	12	22-1	.013″	.037″	.395″
1635/9	9	18	22-1	.013″	.040″	.440″
1635/11	11	22	22-1	.013″	.040″	.485″
1635/15	15	30	22-1	.013″	.045″	.540″
1635/19	19	38	22-1	.013″	.055″	.660″
1635/27	27	54	22-1	.013″	.070″	.800″

STD. P-U: 500′, 1000′. CONSTRUCTION VARIATIONS TO ORDER.

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

CONTROLLED IMPEDANCE CABLE — ELECTRONIC LACING CORDS & TAPES

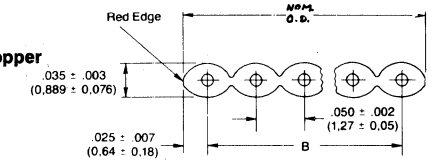
BRIM BRIBBON™ 100 OHM CONTROLLED IMPEDANCE CABLE — UL 2651

DESCRIPTION: Flexible .010" UL VW-1 PVC insulation over 28 AWG 7/36 TC conductors, laid parallel. All conductors are colored Gray, with one edge Red for polarity identification. MEETS UL 2651.

BRIBBON™ cables are designed for fast, mass termination to all standard .050" IDC connectors. Double contour allows reverse plane terminations. Easy conductor separation for circuit routing, and uniform breakouts for harness production.

BRIBBON™ cables replace bulky round twisted paired cables, providing easy routing & greater space utilization within confined chassis. Precise spacing for controlled electrical characteristics — controlled crosstalk thru precisely controlled impedance and capacitance.

CONDUCTORS:
28 AWG (7/36)
Stranded Tinned Copper



Dimensions and charactertiscs subject to change without notice.

BRIM No.	No. Cond.	AWG (Str.)	Cond. to Cond. Spacing	Nom. Wall	Nom. O.D.	Dim. B
2828/9	9	28 (7/36)	.050"	.010"	.035"x .450"	.400"
2828/10	10	28 (7/36)	.050"	.010"	.035"x .500"	.450"
2828/14	14	28 (7/36)	.050"	.010"	.035"x .700"	.650"
2828/15	15	28 (7/36)	.050"	.010"	.035"x .750"	.700"
2828/16	16	28 (7/36)	.050"	.010"	.035"x .800"	.750"
2828/20	20	28 (7/36)	.050"	.010"	.035"x1.000"	.950"
2828/24	24	28 (7/36)	.050"	.010"	.035"x1.200"	1.150"
2828/25	25	28 (7/36)	.050"	.010"	.035"x1.250"	1.200"

STD. P-U: 100 ft.

OPER. TEMP.: 105°C — OPER. VOLTAGE: 300V — OPER. CURRENT: 1 AMP nom. — OPER. IMPEDANCE: 105 Ohms nom.* — OPER. CAPACITANCE: 15 pf/ft. nom.* OPER. PROPAGATION DELAY: 1.4 ns/ft. nom. INSULATION RESISTANCE: >1,000 mΩ/ft. — CONDUCTOR RESISTANCE: 67.5 Ohms/Mft.

BRIM No.	No. Cond.	AWG (Str.)	Cond. to Cond. Spacing	Nom. Wall	Nom. O.D.	Dim. B
2828/26	26	28 (7/36)	.050"	.010"	.035"x1.300"	1.250"
2828/34	34	28 (7/36)	.050"	.010"	.035"x1.700"	1.650"
2828/37	37	28 (7/36)	.050"	.010"	.035"x1.850"	1.800"
2828/40	40	28 (7/36)	.050"	.010"	.035"x2.000"	1.950"
2828/50	50	28 (7/36)	.050"	.010"	.035"x2.500"	2.450"
2828/60	60	28 (7/36)	.050"	.010"	.035"x3.000"	2.950"
2828/64	64	28 (7/36)	.050"	.010"	.035"x3.200"	3.150"

* Measured Ground-Signal-Ground-Signal, etc., with all grounds common.

NYLON FLAT BRAIDED LACING TAPE MIL-T-43435 TYPE I FINISH B

Nylon flat braid, treated with a microcrystalline fungicidal wax finish. Stays flat, flexible, and creates a wider contact to distribute stress. Won't slip when tied. Resistant to fungus, flame, abrasion, and acids.

BRIM No.	Color	Size	Nom. Width	Nom. Thick.	Tensile Strength	Std. P-U
800	White	1	.200"	.016"	135	250 yards
800B	Black	1	.200"	.016"	135	250 yards
801	White	2	.110"	.015"	80	250 yards
801B	Black	2	.110"	.015"	80	250 yards
802	White	3	.085"	.014"	50	500 yards
802B	Black	3	.085"	.014"	50	500 yards
803	White	4	.060"	.012"	25	500 yards
803B	Black	4	.060"	.012"	25	500 yards
804	White	5	.050"	.010"	15	500 yards
804B	Black	5	.050"	.010"	15	500 yards

DACRON FLAT BRAIDED LACING TAPE MIL-T-43435 TYPE II FINISH B

Dacron flat braid, treated with a microcrystalline fungicidal wax finish to help prevent slipping when tying knots, resists fungus and mildew. Won't cut or damage items being held together. Stays flat. Superior to nylon in resistance to acids, and elongation.

BRIM No.	Color	Size	Nom. Width	Nom. Thick.	Tensile Strength	Std. P-U
819	White	2	.110"	.015"	80#	250 yards
819B	Black	2	.110"	.015"	80#	250 yards
820	White	3	.085"	.014"	50#	500 yards
820B	Black	3	.085"	.014"	50#	500 yards
821	White	4	.060"	.012"	25#	500 yards
821B	Black	4	.060"	.012"	25#	500 yards
822	White	5	.050"	.010"	15#	500 yards
822B	Black	5	.050"	.010"	15#	500 yards

TEFLON FLAT BRAIDED LACING TAPE MIL-T-43435 TYPE III FINISH A

OPERATING TEMPERATURE: −100°F TO +450°F. Highly resistant to fluids, fuels and chemicals. Won't outgas under critical vacuum conditions.

BRIM No.	Color	Size	Nom. Width	Nom. Thick.	Tensile Strength	Std. P-U
808	Brown	2	.120"	.011"	30#	250 yards
809	Brown	4	.065"	.011"	15#	500 yards

Hazardous vapors above 400°F (204°C).

TEFLON FIBERGLASS FLAT BRAIDED LACING TAPE — MIL-T-43435 TYPE IV

OPERATING TEMPERATURE: −103°F to +800°F FINISH D. Teflon impregnated fiberglass braided flat, gives high temperature performance, and strength. Stays flat. Teflon finish adds strength and abrasion protection. Will not cut or damage item tied.

BRIM No.	Color	Size	Nom. Width	Nom. Thick.	Tensile Strength	Yds./ Tube
805	White	1	.225"	.016"	200#	250
806	White	2	.110"	.016"	100#	250
807	White	3	.085"	.016"	75#	500

ROUND TWISTED NYLON LACING TAPE MIL-T-713D TYPE P

Round twisted nylon, treated with a microcrystalline fungicidal wax to resist mildew, fungus, and help in tying. OPERATING TEMPERATURE: −67°F to +250°F. P-U: 1 # tubes.

BRIM No.	Color	Class	Tensile Strength	Nom. O.D.	Yds/ Tube
810	White	1	70#	.039"	550
810B	Black	1	70#	.039"	550
811	White	2	48#	.029"	750
811B	Black	2	48#	.029"	750
812	White	3	32#	.025"	1100
812B	Black	3	32#	.025"	1100
813	White	—	20#	.020"	2400
813B	Black	—	20#	.020"	2400

ROUND TWISTED LINEN LACING CORD MIL-T-713 TYPE N

Mfg. from pure flax and treated with a microcrystalline fungicidal wax finish to resist fungus, mildew, and aid in tying. MIL-T-713E TyN. OTHER SIZES AND FINISHES ARE AVAILABLE TO ORDER. P-U: 1# tubes.

BRIM No. Natural	Black	Class	Ply	Nom. O.D.	Tensile Strength	Yds./ Tube
814	814B	—	4	.036"	22#	850
815	815B	3	6	.044"	32#	600
816	816B	2	8	.051"	48#	450
817	817B	—	9	.054"	56#	400
818	818B	1	12	.063"	70#	300

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792 WRITE FOR FREE CATALOG

BRIM WIRE — CABLE — TUBING — HARDWARE
ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

FLAT BRAIDED TINNED COPPER SHIELDING — TUBULAR BRAID PER QQ-B-575A

FLAT BRAIDED TINNED COPPER

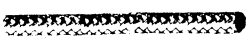
TINNED COPPER FLAT shielded braid, woven then rolled flat. Conductors are annealed for flexibility. Used as grounding cable, bonding strap for aircrafts, marine equipment, vehicles, etc., to eliminate ignition interference. Easily slides over wire and cables. Also used as a high current conductor at low voltages.

BRIM No.	Construction	Flattened I.D.	Flattened O.D.	Appx. AWG Equiv.	Nom. CMA	Current Carrying Cap.* Amps	Std. P-U	BRIM No.	Construction	Flattened I.D.	Flattened O.D.	Appx. AWG Equiv.	Nom. CMA	Current Carrying Cap.* Amps	Std. P-U
1110-1/32	12x 2 of #36	1/32"	3/64"	#22	600	7	100',1000'	1110-3/4	48x11 of #36	3/4"	13/16"	# 9	13200	62	100', 500'
1110-3/64	12x 2 of #36	3/64"	1/16"	#22	600	7	100',1000'	1110-25/32	48x19 of #36	25/32"	27/32"	# 7	22800	88	100', 250'
1110-1/16	16x 3 of #36	1/16"	5/64"	#19	1200	11	100',1000'	1110-1	48x19 of #36	1"	1 1/16"	# 7	22800	88	100', 250'
1110-3/32	16x 3 of #36	3/32"	1/8"	#17	1800	11	100',1000'	1110-1-3/8	48x19 of #36	1 3/8"	1 7/16"	# 7	22800	88	50', 100'
1110-1/8	24x 5 of #36	1/8"	5/32"	#15	3000	25	100',1000'	1110-1-1/2	48x19 of #36	1 1/2"	1 9/16"	# 7	22800	88	50', 100'
1110-3/16	24x 5 of #36	3/16"	7/32"	#15	3000	25	100',1000'	1110-1-3/4	48x27 of #30	1 3/4"	1 7/8"	#00	129600	230	50', 100'
1110-1/4	24x 7 of #36	1/4"	9/32"	#14	4200	32	100',1000'	1110-2	48x32 of #30	2"	2 1/4"	#000	153600	270	50', 100'
1110-3/8	48x 4 of #36	1/8"	15/32"	#13	4800	35	100', 500'	1110-2-1/4	48x35 of #30	2 1/4"	2 1/2"	#000	168000	300	50', 100'
1110-1/2	48x 7 of #36	1/2"	19/32"	#11	8400	50	100', 500'	1110-2-1/2	48x45 of #30	2 1/2"	2 3/4"	#0000	216000	320	50', 100'
1110-5/8	48x 8 of #36	5/8"	23/32"	#10	9600	53	100', 500'	1110-3	48x64 of #30	3"	3 1/4"	300MCM	307200	430	50', 100'

* Values are based on copper in free air at 65°F — intended as a guide only.

TUBULAR BRAID PER QQ-B-575A

TINNED COPPER TUBULAR shielded braid mfg. round per MIL Spec. QQ-B-575A. Shielding coverage of 95% or more. Used in military or critical commercial applications where maximum shielding coverage is required against electrostatic interference. Also useful as grounding wire/cable, bonds, leads, flexible connectors, and protection against mechanical abrasion and stresses for wires/cables. Each wire is soft drawn tinned copper.

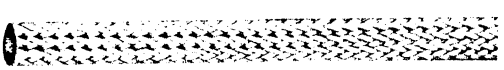


BRIM No.	Nom. I.D. Round	No. of Wires	Const.	Indiv. Wire AWG	Appx. AWG Equiv.	Nom. CMA	Current Carrying Cap.* Amps	Std. P-U	BRIM No.	Nom. I.D. Round	No. of Wires	Const.	Indiv. Wire AWG	Appx. AWG Equiv.	Nom. CMA	Current Carrying Cap.* Amps	Std. P-U
1100-1/32	1/32"	24	24-1	36	#22	600	7	100',1000'	1100-1/2	1/2"	528	48-11	36	# 9	13200	62	100', 500'
1100-1/16	1/16"	48	24-2	36	#19	1200	11	100',1000'	1100-9/16	9/16"	528	48-11	36	# 9	13200	62	100', 250'
1100-5/64	5/64"	72	24-3	36	#17	1800	16	100',1000'	1101-9/16	9/16"	480	48-10	30	# 3	48000	145	100', 250'
1100-7/64	7/64"	96	24-4	36	#16	2400	19	100',1000'	1101-21/32	21/32"	768	48-16	30	# 1	77180	190	100', 250'
1100-1/8	1/8"	120	24-5	36	#15	3000	25	100',1000'	1100-11/16	11/16"	720	48-15	36	# 8	18000	70	100', 250'
1100-5/32	5/32"	240	24-10	36	#12	6000	40	100',1000'	1100-25/32	25/32"	864	48-18	36	# 7	21600	88	100', 250'
1100-11/64	11/64"	168	24-7	36	#14	4200	32	100',1000'	1100-13/16	13/16"	864	48-18	36	# 7	21600	88	100', 250'
1100-3/16	3/16"	192	24-8	36	#13	4800	33	100',1000'	1101-7/8	7/8"	336	48-7	30	# 5	33600	100	50', 100'
1100-13/64	13/64"	312	24-13	36	#11	7800	46	100',1000'	1101-1	1"	384	48-8	30	# 4	38400	120	50', 100'
1100-1/4	1/4"	384	24-16	36	#10	9600	53	100',1000'	1101-1-1/8	1 1/8"	432	48-9	30	# 4	43200	130	50', 100'
1101-9/32	9/32"	120	24-5	30	# 9	12000	60	100', 500'	1101-1-1/4	1 1/4"	480	48-10	30	# 3	48000	145	50', 100'
1100-3/8	3/8"	384	48-8	36	#10	9600	53	100', 500'	1101-1-3/8	1 3/8"	528	48-11	30	# 3	52800	150	50', 100'
1101-7/16	7/16"	240	24-10	30	# 6	24000	90	100', 500'	1101-1-1/2	1 1/2"	576	48-12	30	# 3	57600	165	50', 100'

Larger sizes, and construction variations available to order. All of the above available in bare copper or silver plated copper.
* Values based on copper in free air at 65°F. OVAL & FLAT BRAID PER QQ-B-575 IS AVAILABLE TO ORDER.

STAINLESS STEEL TUBULAR

Shielded braid mfg. with type 304 soft drawn Stainless Steel. Used where higher temperatures and/or greater mechanical strength is needed. STD. P-U 100 feet



BRIM No.	Nom. I.D. When Rounded	Total No. of Wires	Construction	AWG of Indiv. Wires	AWG Equiv.	Nom. CMA	BRIM	Nom. I.D. When Rounded	Total No. of Wires	Construction	AWG of Indiv. Wires	AWG Equiv.	Nom. CMA
1150-1/32	1/32"	48	16-3	#36	#19	1200	1150-3/8	3/8"	336	48-7	#36	#11	8400
1150-1/16	1/16"	48	24-2	#36	#19	1200	1150-7/16	7/16"	384	48-8	#36	#10	9600
1150-5/64	5/64"	72	24-3	#36	#17	1800	1150-1/2	1/2"	432	48-9	#36	#10	10800
1150-7/64	7/64"	96	24-4	#36	#16	2400	1150-5/8	5/8"	528	48-11	#36	# 9	13200
1150-1/8	1/8"	120	24-5	#36	#15	3000	1150-3/4	3/4"	720	48-15	#36	# 8	18000
1150-3/16	3/16"	192	24-8	#36	#13	4800	1150-1	1"	336	48-7	#30	# 5	33600
1150-7/32	7/32"	240	24-10	#36	#12	6000	1150-1-1/2	1-1/2"	480	48-10	#30	# 3	48000
1150-1/4	1/4"	312	24-13	#36	#11	7800							

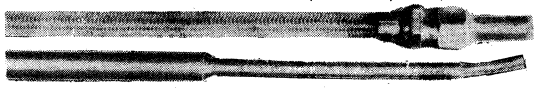
OTHER CONSTRUCTIONS AVAILABLE TO ORDER. OVAL BRAID — PER QQ-B-575 AVAILABLE TO ORDER.

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792 WRITE FOR FREE CATALOG

BRIM WIRE — CABLE — TUBING — HARDWARE ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

HEAT SHRINKABLE TUBINGS: BRIFLON™ TEFLON • TEFZEL – SILICONE RUBBER TUBING

SH200, SH250, SH254 & SHTF tubings have excellent resistance to weathering, chemicals (oils, fuels, solvents, acids, alkalis, fluids), & fungus, are non-corrosive, low water absorption (.01%), will not burn nor support combustion, have hi dielectric strength (850V/MIL dry), low dielectric constant, & a very low coefficient of friction. Hi mechanical strength yet flexible. (Low temp. flexibility −67°C). Their excellent electrical characteristics remain stable throughout their electrical range. Longitudinal change with full shrinkage: FEP −15%: TFE −20%. Color: Natural (FEP-transparent; TFE-translucent).



SH200 (FEP) MIL-I-23053/11

SH200: an extruded modified FEP (Fluorinated-Ethylene-Propylene) Teflon* tubing, with a continuous Oper. Temp. of +205°C (400°F). SH200 completely shrinks at 350°F (partial shrinkage possible at 200°F). Shrinkage ratio — 1.3:1. It melts at 525-563°F so it can be used to encapsulate. Now many sensitive components, parts, devices, etc. can be protected with Teflon*. Fills void between the hi temp. of TFE, and low temp. of PVC and polyolefin tubings.

Briflon No.	Min. Exp. I.D.	Max. Rec. Dimen.** I.D	Max. Rec. Dimen.** Wall	±Wall Toler.
SH200-24	.031″	.027″	.008″	.002″
SH200-22	.036″	.032″	.008″	.002″
SH200-20	.045″	.039″	.008″	.002″
SH200-18	.060″	.049″	.008″	.002″
SH200-16	.075″	.061″	.009″	.002″
SH200-14	.092″	.072″	.009″	.002″
SH200-12	.115″	.089″	.009″	.002″
SH200-10	.141″	.114″	.010″	.003″
SH200-9	.158″	.124″	.010″	.003″
SH200-8	.180″	.143″	.010″	.003″
SH200-7	.197″	.158″	.011″	.004″
SH200-6	.225″	.180″	.011″	.004″
SH200-5	.248″	.198″	.011″	.004″
SH200-4	.290″	.226″	.011″	.004″
SH200-3	.310″	.249″	.011″	.004″
SH200-2	.365″	.280″	.012″	.004″
SH200-1	.400″	.311″	.012″	.004″
SH200-0	.440″	.349″	.012″	.004″
SH200-3/8″	.500″	.383″	.015″	.004″
SH200-7/16″	.580″	.448″	.020″	.004″
SH200-1/2″	.666″	.510″	.020″	.004″
SH200-5/8″	.830″	.637″	.025″	.004″
SH200-3/4″	1.000″	.764″	.030″	.004″
SH200-7/8″	1.170″	.891″	.035″	.004″
SH200-1″	1.330″	1.020″	.035″	.004″
SH200-1 1/4″	1.660″	1.270″	.035″	.004″
SH200-1 1/2″	2.000″	1.520″	.035″	.004″

STD. P-U: 100′, 4 foot minimum lengths. * DuPont.

** All dimensions are based on full recovery.

OTHER SIZES IN TFE AND FEP, AND COLORS ARE AVAILABLE TO ORDER. ETCHING FOR BONDING IS AVAILABLE TO ORDER.

SH254 4:1 SHRINKABLE TFE

SH254 tubing can recover to approximately ¼ of its expanded size when heated to its "gel" point (621°F-625°F). Because of its exceptional shrinkage capability, its recommended that the outside diameter of the object to be shrunk down upon should not be more than 50% of the expanded I.D. of the size of the tubing used. Many constructions conform to AMS 3584 and MIL-I-23053/12 class 5. SH254 is non-flammable, non-corrosive, and offers all of the other outstanding electrical, chemical, and mechanical properties of Teflon*. * DuPont

Briflon No.	Max. Exp. I.D.	Max. Rec. Dimin.** I.D.	Max. Rec. Dimin.** Wall	±Wall Toler.
SH254-5/64″*	.078″	.025″	.009″	.002″
SH254-1/8″*	.125″	.037″	.010″	.002″
SH254-3/16″	.187″	.050″	.012″	.003″
SH254-1/4″*	.250″	.063″	.012″	.003″
SH254-5/16″	.312″	.079″	.012″	.003″
SH254-3/8″*	.375″	.096″	.012″	.003″
SH254-7/16″	.438″	.112″	.012″	.003″
SH254-1/2″*	.500″	.144″	.015″	.004″
SH254-9/16″	.562″	.155″	.015″	.004″
SH254-5/8″*	.625″	.178″	.015″	.004″
SH254-11/16″	.687″	.198″	.015″	.004″
SH254-3/4″*	.750″	.224″	.015″	.004″
SH254-7/8″	.875″	.244″	.015″	.004″
SH254-1″*	1.000″	.278″	.015″	.004″
SH254-1 1/4″*	1.250″	.347″	.015″	.004″

STD. P-U: 100′, in 4 foot lengths. Std. Color: Natural (Clear)
* Per MIL-I-23053/12 Class 5

SH250 (TFE) MIL-I-23053/12

SH250: an extruded modified TFE (PolyTetra-FluoroEthylene) Teflon* tubing, with a continuous Operating Temperature of +250°C (550°F). SH250 will shrink when heated to 621°F. Shrinkage ratio — 2:1. Used wherever hi-temperature protection required. Applications: Protective covers in corrosive environments, protection for electronic components, cable jacketing, covers on immersion heaters, heat exchangers, light duty bearing surfaces, roll covers.

Briflon No.	Class	Min. Exp. I.D.	Max. Rec. Dimen.** I.D.	Max. Rec. Dimen.** Wall	±Wall Toler.
SH250-30	3	.034″	.015″	.009″	.002″
SH250-28	3	.038″	.018″	.009″	.002″
SH250-26	3	.046″	.022″	.010″	.002″
SH250-24	3	.050″	.027″	.010″	.002″
SH250-22	3	.055″	.032″	.012″	.003″
SH250-20	3	.060″	.039″	.012″	.003″
SH250-19	3	.065″	.043″	.012″	.003″
SH250-18	3	.076″	.049″	.012″	.003″
SH250-17	3	.085″	.054″	.012″	.003″
SH250-16	3	.093″	.061″	.012″	.003″
SH250-15	3	.110″	.067″	.012″	.003″
SH250-14	3	.120″	.072″	.012″	.003″
SH250-13	3	.140″	.080″	.012″	.003″
SH250-12	3	.150″	.089″	.012″	.003″
SH250-11	3	.170″	.101″	.012″	.003″
SH250-10	3	.191″	.112″	.012″	.003″
SH250-9	3	.205″	.124″	.015″	.004″
SH250-8	3	.240″	.141″	.015″	.004″
SH250-7	3	.270″	.158″	.015″	.004″
SH250-6	3	.302″	.178″	.015″	.004″
SH250-5	3	.320″	.198″	.015″	.004″
SH250-4	3	.370″	.224″	.015″	.004″
SH250-3	3	.390″	.249″	.015″	.004″
SH250-2	3	.430″	.278″	.015″	.004″
SH250-1	3	.450″	.311″	.015″	.004″
SH250-0	3	.470″	.347″	.015″	.004″
SH250-3/8″	2	.560″	.399″	.025″	.006″
SH250-1/2″	2	.750″	.524″	.025″	.006″
SH250-5/8″	2	.930″	.655″	.030″	.006″
SH250-3/4″	2	1.125″	.786″	.035″	.008″
SH250-1″	2	1.500″	1.036″	.035″	.008″

STD. P-U 100′, Sizes 26-14: 3 foot minimum lengths. 13-1″ 1 foot minimum length. Sizes 30 to 0 are per class 3. Sizes 3/8″ to 1″ are per class 2.

SHTF SHRINKABLE TFE/FEP

SHTF is made with a combination of TFE and FEP Teflons*. The inner wall is made of FEP and the outer wall of TFE. When the tubing is heated, the TFE begins to shrink down tightly over the FEP. The FEP inner wall melts and flows-squeezes-into and around the item covered, creating a solid or near solid encapsulation. The fit is so tight that it is safe against most environmental hazards, involving pull or vibrations. It can be used as a strain relief, or moisture-proof covering for wires, connectors, terminals, splices, electronic devices, etc. SHTF is non-flamable, non-corrosive, and offers all of the other outstanding electrical, chemical, and mechanical properties of Teflon*. Color: Natural (Transparent). OPERATING TEMPERATURE: −85°F to +450°F.

Briflon No.	Min. Exp. I.D.	Max. Rec. Dimen.** I.D.	Max. Rec. Dimen.** Wall	Std. P-U+
SHTF-1	.065″	.000″**	.015″	100′
SHTF-2	.115″	.045″	.015″	100′
SHTF-3	.130″	.060″	.015″	100′
SHTF-4	.180″	.065″	.015″	100′
SHTF-5	.190″	.070″	.015″	100′
SHTF-6	.240″	.150″	.020″	100′
SHTF-7	.350″	.210″	.025″	100′
SHTF-8	.480″	.315″	.032″	100′
SHTF-9	.700″	.440″	.055″	100′
SHTF-10	1.000″	.700″	.045″	100′

** Fully closes off. +In random lengths of 1 foot to 3 feet. * DuPont

OTHER SIZES AND COLORS AVAILABLE TO ORDER.

BRIMFLEX BSR SILICONE RUBBER TUBING— ZZ-R-765 200°C

BRIMFLEX BSR Silicone Rubber tubing is an extremely elastic and stable high temperature and low temperature tubing. Besides being extremely flexible, it has excellent mechanical strength (tear resistance, tensile strength, elongation, and weather resistance), and outstanding dielectric strength, and corona resistance. BSR meets MIL-R-5847 and Fed. Spec. ZZ-R-765, Class 2b, STD. COLOR: WHITE. OPERATING VOLTAGE: 28 AWG-5/8″ — 300V, 3/4″-1″ — 600V.

Brimflex No.	Size	Nom. I.D.	Nom. Wall	Std. P.U.
BSR-28	28	.015″	.016″	1000′
BSR-26	26	.018″	.016″	1000′
BSR-24	24	.022″	.016″	1000′
BSR-22	22	.027″	.016″	1000′
BSR-20	20	.034″	.016″	1000′
BSR-19	19	.038″	.016″	1000′
BSR-18	18	.042″	.016″	1000′
BSR-17	17	.047″	.016″	1000′
BSR-16	16	.053″	.016″	1000′
BSR-15	15	.059″	.016″	500′
BSR-14	14	.066″	.016″	500′
BSR-13	13	.076″	.016″	500′
BSR-12	12	.085″	.016″	500′
BSR-11	11	.095″	.016″	500′
BSR-10	10	.106″	.016″	500′
BSR-9	9	.118″	.020″	500′
BSR-8	8	.133″	.020″	500′
BSR-7	7	.148″	.020″	500′
BSR-6	6	.166″	.020″	500′
BSR-5	5	.186″	.020″	250′
BSR-4	4	.208″	.020″	250′
BSR-3	3	.233″	.020″	250′
BSR-2	2	.262″	.020″	250′
BSR-1	1	.294″	.020″	250′
BSR-0	0	.329″	.025″	250′
BSR-3/8″	3/8″	.382″	.025″	250′
BSR-7/16″	7/16″	.446″	.025″	250′
BSR-1/2″	1/2″	.508″	.025″	100′
BSR-5/8″	5/8″	.636″	.030″	100′
BSR-3/4″	3/4″	.760″	.060″	100′
BSR-7/8″	7/8″	.895″	.070″	100′
BSR-1″	1″	1.010″	.080″	100′

SHRINKABLE E-TFE TEFZEL* TUBING — MIL-I-23053/14

Designed for ruggedness. Excellent chemical resistance and high dielectric qualities which exist over a wide temperature range. Superior to Teflon* in its mechanical strength. Shrink Ratio-1.5:1. Shrinks quickly on application of only 300°F (150°C). Because of its quick shrinking ability at a relatively low temperature, many heat sensitive components and materials (solder joints, plastics, wood, metal) can now be easily protected. It is also heat sealable, chemically inert, self-extinguishing (non-flamable in air). Dielectric Strength: 400V/MIL. Uses: cable jacketing, wire markers, terminal covers, temperature probes, immersion tubing, heat exchanger coils, sight glasses, roll covers, chafe guards, component insulation. STD. COLOR: Translucent.

Brimflex No.	Min. Expd. I.D.	Recovered Dimen. I.D. Max.	Recovered Dimen. Wall	±Wall† Toler.
SH150-1/8″	.125″	.083″	.010″	.002″
SH150-3/16″	.188″	.125″	.011″	.002″
SH150-1/4″	.250″	.166″	.013″	.003″
SH150-3/8″	.375″	.250″	.013″	.003″
SH150-1/2″	.500″	.345″	.013″	.003″
SH150-3/4″	.750″	.500″	.018″	.004″
SH150-1″	1.000″	.665″	.022″	.004″

Brimflex No.	AWG**	Rec. M.M.	STD. P-U
SH150-1/8″	12	2.11	100′, 1000′
SH150-3/16″	8	3.18	100′, 1000′
SH150-1/4″	6	4.62	100′, 1000′
SH150-3/8″	2	6.35	100′, 1000′
SH150-1/2″	00	8.76	100′, 1000′
SH150-3/4″	0000	12.70	100′, 500′
SH150-1″	350MCM	16.89	100′, 500′

STD. LENGTHS: 4 foot lengths with random lengths of 1 foot minimum. † If full recovery allowed.

E-TFE TEFZEL* SPAGHETTI TUBING IS AVAILABLE TO ORDER. ** O.D. of closest equivalent wire. * DuPont SHRINKABLE PVC TUBING per MIL-I-23053/2 IS AVAILABLE.

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792 WRITE FOR FREE CATALOG

BRIM WIRE — CABLE — TUBING — HARDWARE ELECTRONICS, INC. FAIR LAWN, N.J. 201-796-2886

BRIMFLEX™ SHRINKABLE TUBINGS — SPIRAL WRAP TUBINGS

BRIFLEX™ SHRINKABLE PVC TUBINGS: MIL-I-23053/2B & HEAVY WALL PVC TUBING

SHRINKABLE IRRADIATED POLYOLEFIN: MIL-I-23053/5 — SPIRAL WRAP TUBING

BRIMFLEX™ POLYVINYLCHLORIDE SHRINKABLE TUBING — MIL-I-23053/2B & UL VW-1

SHRINK RATIO: 2:1 (50%) — OPERATING TEMPERATURE: −20°C to +105°C

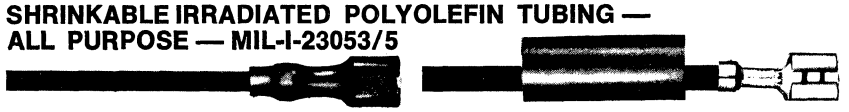
BRIMFLEX™ SH105 is a flexible all purpose shrinkable PVC tubing that shrinks 50% of its expanded size when exposed to temperatures below 200°F (within one minute). SH105 meets MIL-I-23053/2B, Class 2, and conforms to MIL-I-631D, Grade C. Longitudinal shrinkage: approximately 20%. SH105 is self-extinguishing, resistant to fungus, most oils, and chemicals, sunlight, moisture, and is non-corrosive. SH105 is suitable for insulating wires, cables, and electronic components, that vary in shapes, and dimensions. Produces a smooth snug flexible fit, in most applications — even around sharp bends. Dielectric Strength: 700V/MIL min., ASTM-D922. Tensile Strength: 2000PSI min. Suggested Storage Temperature: under 70°F for up to 10 months. UL Approved SH105 is available to order.

STD. COLORS: Black, Clear, Red, White. Other colors available to order.

Brimflex No.	Min. Exp. I.D.	Recovered Dimen.* I.D. Max.	Recovered Dimen.* Wall	±Wall Toler.	AWG**	Rec. M.M.	Std. P-U
SH105-3/64"	.046"	.023"	.020"	.003"	24-22	0.59	— — 1000'
SH105-1/16"	.063"	.031"	.020"	.003"	22-20	0.80	100', 500', 1000'
SH105-3/32"	.093"	.046"	.025"	.003"	18-16	1.19	100', 500', 1000'
SH105-1/8"	.125"	.063"	.025"	.003"	14	1.59	100', 500', 1000'
SH105-3/16"	.187"	.093"	.025"	.003"	12-10	2.39	100', 500', 1000'
SH105-1/4"	.250"	.125"	.025"	.005"	8	3.18	100', 500', 1000'
SH105-5/16"	.312"	.156"	.028"	.005"	7	3.97	100', 250', 500'
SH105-3/8"	.375"	.187"	.028"	.005"	5	4.77	100', 250', 500'
SH105-1/2"	.500"	.250"	.028"	.005"	2	6.35	100', 250', 500'
SH105-3/4"	.750"	.375"	.033"	.005"	00	9.52	100', 250', 500'
SH105-1"	1.000"	.500"	.038"	.005"	0000	12.70	100', 250', 500'
SH105-1 1/2"	1.500"	.750"	.043"	.005"	450MCM	19.05	25', 50', 100'
SH105-2"	2.000"	1.000"	.048"	.006"	750MCM	25.40	25', 50', 100'
SH105-3"	3.000"	1.500"	.068"	.007"	1750MCM	38.10	— — 100'
SH105-4"	4.000"	2.000"	.073"	.008"	2750MCM	50.80	— — 100'

* If full recovery allowed. ** O.D. of closest equivalent wire.

SHRINKABLE IRRADIATED POLYOLEFIN TUBING — ALL PURPOSE — MIL-I-23053/5

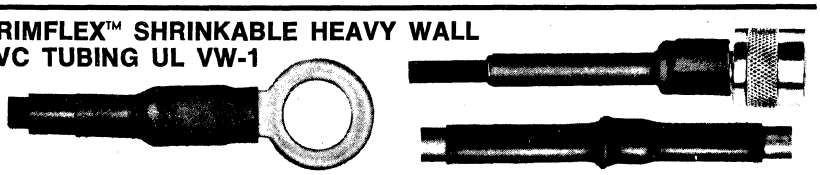


Flexible, yet greater electrical, chemical, and abrasion resistance, and greater mechanical strength than that of shrinkable PVC tubing. It not only insulates, it can also encapsulate, giving a watertight fit. Won't crack or peel. Its non-corrosive, has excellent resistance to soldering irons, oils, solvents, acids, alkalis, fuels, hydraulic fluids, fungus. Shrink Ratio-2:1 (50%). Shrinks when exposed to 250°F. Longitudinal shrinkage: 5%. Dielectric Strength: 1300V/MIL. Colored tubing is self-extinguishing; clear tubing is slow burning. Uses: Strain relief, jacketing material, component insulation. OPERATING TEMPERATURE: −55°C to +135°C. Meets MIL-I-23053/5, Class 1, 2. MIL-I-7444B, AMS 3636B, AMS 3637A, ASTM D876, ASTM D150, ASTM D257, ASTM D2671, ASTM D792.

Brimflex No.	Min. Exp. I.D.	Recovered Dimen.* I.D. Max.	Recovered Dimen.* Wall	±Wall Toler.	AWG**	Rec. M.M.	Std. P-U
SH135-3/64"	.046"	.023"	.016"	.003"	24-22	0.59	100', 500', 1000'
SH135-1/16"	.063"	.031"	.016"	.003"	22-20	0.80	100', 500', 1000'
SH135-3/32"	.093"	.046"	.020"	.003"	18-16	1.19	100', 500', 1000'
SH135-1/8"	.125"	.063"	.020"	.003"	14	1.59	100', 500', 1000'
SH135-3/16"	.187"	.093"	.020"	.003"	12-10	2.39	100', 500', 1000'
SH135-1/4"	.250"	.125"	.025"	.003"	8	3.18	100', 500', 1000'
SH135-3/8"	.375"	.187"	.025"	.003"	5	4.77	50', 100', 200'
SH135-1/2"	.500"	.250"	.025"	.003"	2	6.35	50', 100', 200'
SH135-3/4"	.750"	.375"	.030"	.005"	00	9.52	25', 50', 100'
SH135-1"	1.000"	.500"	.035"	.006"	0000	12.70	25', 50', 100'
SH135-1 1/2"	1.500"	.750"	.040"	.006"	450MCM	19.05	25', 50', 100'
SH135-2"	2.000"	1.000"	.045"	.007"	750MCM	25.40	25', 50', 100'
SH135-3"	3.000"	1.500"	.050"	.008"	1750MCM	38.10	10', 25', 50'
SH135-4"	4.000"	2.000"	.055"	.009"	2750MCM	50.80	10', 25', 50'

STD. COLORS: Black, Clear, Red, White. Other colors are available to order.
* If full recovery allowed. ** O.D. of closest equivalent wire.

BRIMFLEX™ SHRINKABLE HEAVY WALL PVC TUBING UL VW-1



Brmflex No.	Min. Exp. I.D.	Recovered Dimen.* I.D. Max.	Recovered Dimen.* Wall	±Wall Toler.	AWG**	Rec. M.M.	Std. P-U
SH110-1/8"	.125"	.063"	.032"	0.05"	14	1.59	1000'
SH110-3/16"	.187"	.093"	.032"	0.05"	12-10	2.39	1000'
SH110-1/4"	.250"	.125"	.032"	0.05"	8	3.18	1000'
SH110-5/16"	.312"	.156"	.032"	0.05"	6	3.97	500'
SH110-3/8"	.375"	.187"	.032"	0.05"	4	4.77	500'
SH110-1/2"	.500"	.250"	.032"	0.05"	2	6.35	250'

* If full recovery allowed. ** O.D. of closest equivalent wire.

SEMI-RIGID POLYOLEFIN SHRINKABLE TUBING IS AVAILABLE TO ORDER.
CUT AND PRINTED WIRE MARKERS ARE AVAILABLE TO ORDER.

SPIRAL WRAP TUBINGS FOR HARNESSING

Easily twists on and off. Can be repeatedly flexed without cracking or breaking. Expandable. Holds wire, and cable bundles securely, and allows leadoffs or additions at any point. Bends around sharp corners, and protection against sharp edges. Available in 4 types of insulations: Polyethylene, Rulan (a flame retardent type of polyethylene), Nylon, Teflon. All are resistant to organic solvents, alkalis, and acids (nylon satisfactory except for strong acids). OSHA and UL approved for harnessing cables.

Brimflex No.	Covers Max. Wire Group	Nom. O.D.	Nom. Wall
POLYETHYLENE (CLEAR)*		−105°F to +215°F	
PSW-1/8"	1/16" to 1/2"	1/8"	.032"
PSW-3/16"	1/8" to 1"	3/16"	.032"
PSW-1/4"	3/16" to 2"	1/4"	.045"
PSW-3/8"	3/16" to 3"	3/8"	.052"
PSW-1/2"	3/8" to 4"	1/2"	.062"
PSW-3/4"	3/4" to 5"	3/4"	.065"
PSW-1"	1" to 6"	1"	.095"
RULAN (WHITE)**		−8°F to +200°F	
RSW-1/8"	1/16" to 1/2"	1/8"	.032"
RSW-1/4"	3/16" to 2"	1/4"	.045"
RSW-3/8"	5/16" to 3"	3/8"	.052"
RSW-1/2"	3/8" to 4"	1/2"	.062"
RSW-3/4"	5/8" to 5"	3/4"	.065"
RSW-1"	1" to 7"	1"	.095"
NYLON (NATURAL)***		−121°F to +300°F	
NSW-1/8"	1/16" to 1/2"	1/8"	.015"
NSW-1/4"	3/16" to 2"	1/4"	.025"
NSW-3/8"	5/16" to 3"	3/8"	.032"
NSW-1/2"	3/8" to 4"	1/2"	.032"
NSW-3/4"	1/2" to 5"	3/4"	.032"
NSW-1"	1" to 7"	1"	.032"
TEFLON (NATURAL)****		−275°F to +500°F	
TSW-1/8"	1/16" to 1/2"	1/8"	.030"
TSW-3/16"	1/8" to 1"	3/16"	.030"
TSW-1/4"	3/16" to 2"	1/4"	.030"
TSW-3/8"	3/16" to 2 1/2"	3/8"	.030"
TSW-1/2"	3/8" to 3"	1/2"	.030"
TSW-3/4"	5/8" to 4"	3/4"	.032"
TSW-1"	3/4" to 5"	1"	.040"

STD. P-U 1/8" to 1/4" — 100', 1000'; 3/8" to 1/2" — 100', 500'; 3/4" and 1" — 100'

* MIL-E-16400, MIL-P-3803, MIL-I-631D, MIL-E- 5400F, Fed. Spec. L-P-390, ASTM D1248-65T.
** UL-70, ASTM D635, MIL-E-5400F.
*** MIL-P-20693A, MIL-P-17091B, L-P-4100, MIL-T-47287
**** MIL-1-22129C, AMS3653C, AMS3655, MIL-T-47287

BLACK NYLON AND POLYETHYLENE SPIRAL WRAP FOR ULTRAVIOLET RAY PROTECTION IS AVAILABLE.

LOW & HI TEMP. PVC TUBING PER MIL-I-631 & MIL-I-7444 STOCKED.

SHRINK RATIO: 2:1 (50%) — OPERATING TEMPERATURE: −20°C to +105°C

SH110 meets or exceeds the performance requirements of MIL-I-23053/2B, Class 2 but for its dimensions — its heavier wall. SH110 is a Heavy Wall Shrinkable PVC tubing, yet its flexible, and will shrink at temperatures below 200°F (within one minute). Provides outstanding dielectric and mechanical protection without damage to enclosed or adjacent components, even around sharp bends. Longitudinal shrinkage: approximately 20%. SH110 is self-extinguishing, resistant to fungus, moisture, sunlight, and most oils, and chemicals. Dielectric Strength: 600V/MIL min,. ASTM-D922. Suitable as a heavy duty all-purpose shrinkable tubing that is less expensive, almost as flexible, and has a higher temperature ability than that of Shrinkable Neoprene tubing. Suggested Storage Temperature: Under 70°F for up to 10 months.

BRIM ELECTRONICS, INC., DEPT. EM, P.O. BOX 336E, FAIR LAWN, NJ 07410 (201) 796-2886 FAX 201-778-2792 WRITE FOR FREE CATALOG

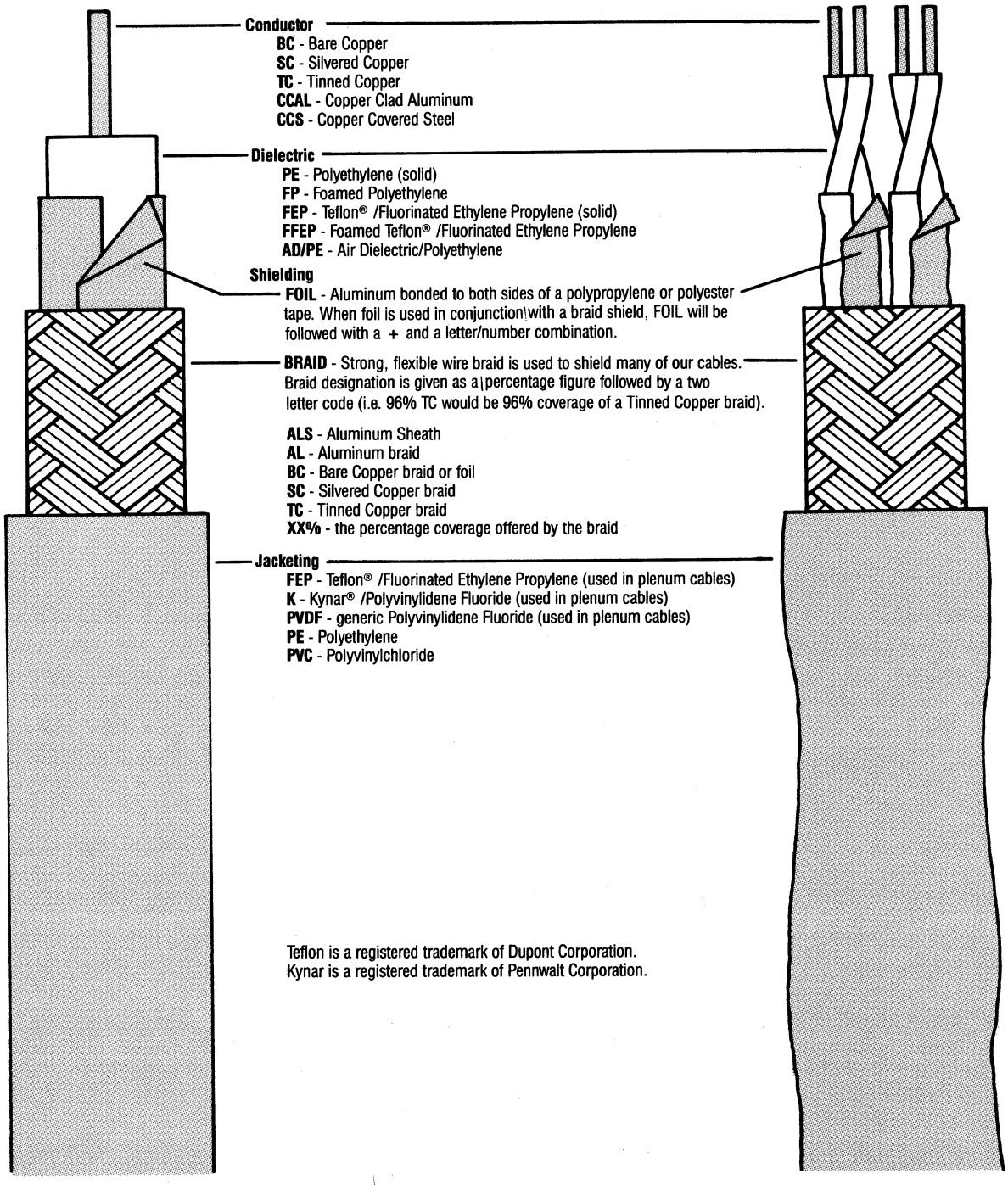
MINIGLOSSARIES
FORMULAS • CHARTS
PRODUCT SELECTION GUIDES
FORMS
CODES TECHNICAL INFORMATION

WHERE TO FIND THEM IN THE 88/89 EDITION OF EEM

Abbreviations/Acronyms ..... **A**•1404, **B**•1090, **C**•1119 **D**•1156
AC Power Supplies, Product Selection Guide ..... **D**•2156
ASCII Code ..... **D**•1080
Batteries, Product Selection Guide .... **D**•1447
Batteries & Fuel Cells, Characteristics ..... **D**•1450
Cabinets, Enclosures, Racks & Chassis, Product Selection Guide ..... **C**•1003
Capacitors, Basic Formulas ..... **A**•1093
Capacitors, Miniglossary ..... **A**•1066
Capacitors, Product Selection Guide **A**•1002
Coils, Chokes, Inductors, Product Selection Guide ..... **A**•1197
Conductors, Maximum Current Capacity of Copper & Aluminum ... **A**•2272, **C**•1316
Connectors, Miniglossary ..... **C**•1271
Connectors, Terminals & Sockets, Product Selection Guide ..... **C**•1127
Crystals, Oscillators, Crystal & Piezoelectric Filters, Product Selection Guide ..... **A**•1339
DC Power Supplies, Product Selection Guide ..... **D**•1537
Delay Lines, Product Selection Guide ..... **A**•1503
Dielectrics, Thermal Conductivity ..... **B**•1916
Discrete Semiconductors, Product Selection Guide ..... **A**•2154
Displays, Readouts, & CRTs, Product Selection Guide ..... **B**•1041
EBCDIC Code ..... **D**•1086
Encapsulation, Miniglossary ..... **C**•1124
Fans, Blowers, Cooling Equipment, & Heat Exchangers, Product Selection Guide ..... **C**•1631
Fiber Optics, Miniglossary ..... **B**•1185
Fiber Optics, Product Selection Guide ..... B•1204
Filters, Power, Product Selection Guide ..... **A**•1642
Filters, Signal, Product Selection Guide ..... **A**•1683
IC Master ..... **A**•1740
Instruments, Test & Measuring, Product Selection Guide ..... **D**•1210
Interconnection Systems, Product Selection Guide ..... **C**•1702
Keyboards & Keypads, Product Selection Guide ..... **B**•1854
Lamps, Lights, & Indicators, Product Selection Guide ..... **B**•1126
Logofinder & Trademark Directories ... **C**•901
Microwave Components, Product Selection Guide ..... **A**•1776
Military Qualified Products List ..... **B**•1002
Motors, Drives, & Rotating Components, Product Selection Guide ..... **B**•1221
Opto Semiconductors, Miniglossary ..... **A**•2169
Oscilloscopes, Product Selection Guide ..... **D**•1426
Panel Hardware, Product Selection Guide ..... **C**•1583
Panel Meters, Analog & Digital, Product Selection Guide ..... **D**•1376
Potentiometers, Trimmers, Controls, & Rheostats, Product Selection Guide ..... **A**•2078
Power Supplies, Miniglossary ..... A•2276, **D**•1541
Power Supplies, AC, Product Selection Guide ..... **D**•2156
Power Supplies, DC, Product Selection Guide ..... **D**•1537
Protective Components (Fuses, Circuit Breakers, etc.), Product Selection Guide ..... **B**•1351
Relay Contact Forms ..... **B**•1450
Relays, Electromechanical, Miniglossary ..... **B**•1414
Relays, Product Selection Guide ..... **B**•1411
Resistor Color Codes ..... **A**•1952
Resistors, Product Selection Guide ... **A**•1867
Servo Components, Miniglossary ..... **B**•1266
SI Units, Basic Guide To, ... **A**•1434, **B**•1472, **C**•1692, **D**•1386
Solenoids, Product Selection Guide ... **B**•1655
Switches, Product Selection Guide .... **B**•1673
Symbols—International Authorities ..... **A**•1454, **B**•1064, **C**•1104, **D**•1166
Thermal Components, Product Selection Guide ..... **B**•1886
Thermal Conductivity of Dielectrics at Room Temperature ..... **B**•1916
Thyristors/High Power Diodes, Miniglossary ..... **A**•2211
Timers, Miniglossary ..... **B**•1492, **D**•1140
Trademark & Logofinder Directories ... **C**•901
Transducers & Encoders, Product Selection Guide ..... **B**•1928
Transformers, Product Selection Guide ..... **A**•2215
Voltage Drop Nomograph ..... **A**•2262, **C**•1469, **C**•1960 **D**•1718
Wire & Cable, Product Selection Guide ..... **C**•1755
Wire Gauges—Diameter, Area, Copper Weight ..... **C**•1343, **C**•1759

Cable Construction

Comm/Scope, Inc.
NETWORK CABLE DIVISION



Conductor
- **BC** - Bare Copper
- **SC** - Silvered Copper
- **TC** - Tinned Copper
- **CCAL** - Copper Clad Aluminum
- **CCS** - Copper Covered Steel

Dielectric
- **PE** - Polyethylene (solid)
- **FP** - Foamed Polyethylene
- **FEP** - Teflon® /Fluorinated Ethylene Propylene (solid)
- **FFEP** - Foamed Teflon® /Fluorinated Ethylene Propylene
- **AD/PE** - Air Dielectric/Polyethylene

Shielding

FOIL - Aluminum bonded to both sides of a polypropylene or polyester tape. When foil is used in conjunction with a braid shield, FOIL will be followed with a + and a letter/number combination.

BRAID - Strong, flexible wire braid is used to shield many of our cables. Braid designation is given as a percentage figure followed by a two letter code (i.e. 96% TC would be 96% coverage of a Tinned Copper braid).

- **ALS** - Aluminum Sheath
- **AL** - Aluminum braid
- **BC** - Bare Copper braid or foil
- **SC** - Silvered Copper braid
- **TC** - Tinned Copper braid
- **XX%** - the percentage coverage offered by the braid

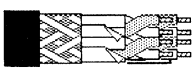
Jacketing
- **FEP** - Teflon® /Fluorinated Ethylene Propylene (used in plenum cables)
- **K** - Kynar® /Polyvinylidene Fluoride (used in plenum cables)
- **PVDF** - generic Polyvinylidene Fluoride (used in plenum cables)
- **PE** - Polyethylene
- **PVC** - Polyvinylchloride

Teflon is a registered trademark of Dupont Corporation.
Kynar is a registered trademark of Pennwalt Corporation.

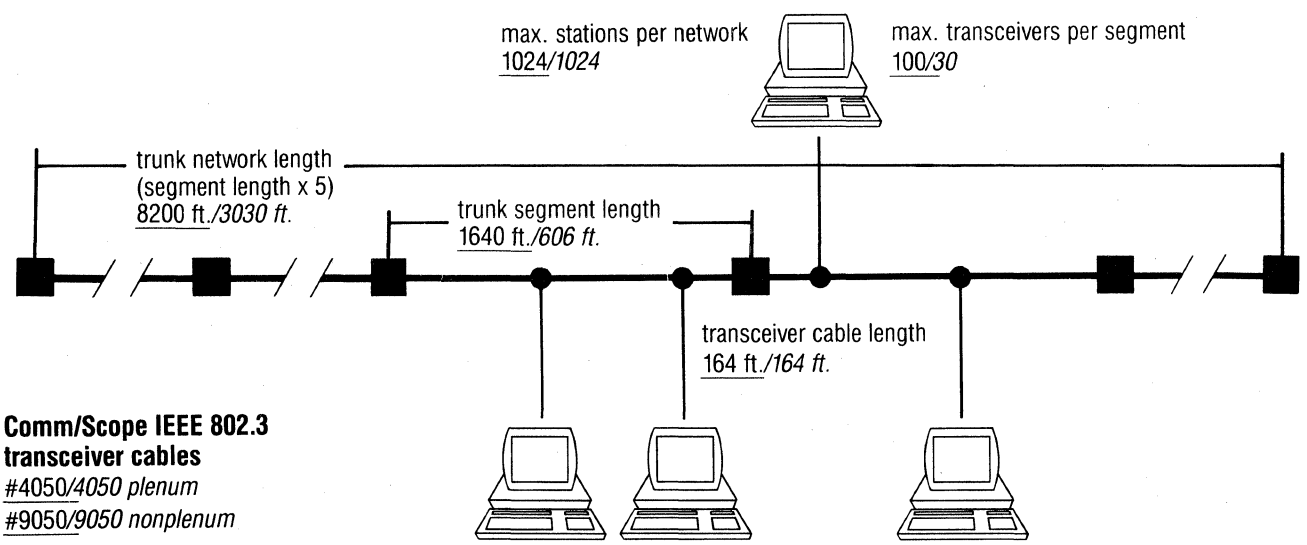
Comm/Scope, Inc. Network Cable Division • PO Box 1729 • 1375 Lenoir-Rhyne Blvd. • Hickory, NC 28602 • (800) 982-1708 • (704) 324-2200 • FAX (704) 328-3400

Recommended ETHERNET*/Thinnet Cables (IEEE 802.3)

Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION / QUALIFICATIONS	PART NUMBER	NO. OF CONDUCTORS AWG / WIRE TYPE	INSULATION NOM. O.D. IN INCHES	CONDUCTOR NOM. DCR OHMS/1000'	DATA PAIR SHIELD CONSTRUCTION NOM. DCR OHMS/1000'	JACKET THICKNESS NOM. O.D. IN INCHES	NOM. CAP. PF/Ft	NOM. VEL. OF PROP.	NOM. IMP. (OHMS)
	DESCRIPTION: Stranded Conductors, tinned copper, 3 pair polyethylene insulated, 1 pair PVC insulated, twisted pairs each individually shielded with aluminum-polyester shield, 20 AWG stranded tinned copper drain wire, Mylar isolation wrap and overall aluminum-polyester shield, 94% tinned copper braid shield, PVC jacket, CL2 rated.								
IEEE 802.3 NON PLENUM TRANSCEIVER **CL2**	**9050**	4 Pairs 20 (7 x 28)	3 Pairs .078 1 Pair .058	10.5	Individual FOIL + 94% TC Overall 3	PVC .035 .405	18.9	66%	78
	DESCRIPTION: Stranded Conductors, tinned copper, Teflon insulated, twisted pairs individually shielded with aluminum-polyester shield, 20 AWG stranded tinned copper drain, Mylar isolation wrap, and overall aluminum-polyester shield, 94% tinned copper braid shield, Teflon or Kynar jacket. NEC 725 Class 2 Classified for use in an air plenum non-conduit, CL2P rated.								
IEEE 802.3 PLENUM TRANSCEIVER  **CL2P**	**4050** **4050K**	4 Pairs 20 (7 x 22)	3 Pairs .078 1 Pair .060	10.5	Individual FOIL + 94% TC Overall 3	FEP or KYNAR .020	18.9	70%	78

ETHERNET (IEEE 802.3)/*Thinnet (IEEE 802.3)*



Comm/Scope IEEE 802.3 transceiver cables
#4050/*4050 plenum*
#9050/*9050 nonplenum*

Comm/Scope IEEE 802.3 trunk cables
#2280/*#2135 (#2104 DEC**) plenum*
#2281/*#2135 (#2104 DEC) plenum*
#3250/*#3135 (#3104 DEC) nonplenum*

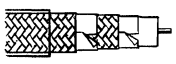
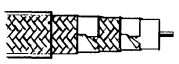
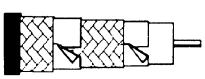
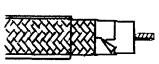
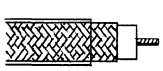
NOTE: The dimensions and statistics given here are for reference only and may vary depending upon your particular application. Consult with your system installer for the exact parameters of your planned system.

*ETHERNET is a registered trademark of Xerox, Inc.
**Digital Equipment Corp.

"K" after the part number indicates a KYNAR jacket.
No initial indicates a FEP (Teflon) jacket.

Recommended ETHERNET*/Thinnet Cables (IEEE 802.3)

Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION / QUALIFICATIONS	PART NUMBER	CENTER CONDUCTOR AWG OR DIA. IN IN. / WIRE TYPE / NOM DCR OHMS/1000'	DIELECTRIC NOM O.D. IN INCHES	SHIELD CONSTRUCTION / NOM DCR OHMS/1000'	JACKET & NOM O.D. IN INCHES	NOM CAP. Pf/Ft	NOM VEL. OF PROP.	NOM IMP. (OHMS)	NOMINAL ATTENUATION MHz / db/100'
ETHERNET **DEC #(17-00324)** **IEEE 802.3**  **CL2P**	**2280** **2280K**	.0855 Solid BC 1.42	FFEP .247	2 FOIL + 90% 2 TC 1.4	FEP .375 KYNAR .366	25.0	78%	50	10 0.52
ETHERNET **IEEE 802.3**  **CL2P**	**2281K**	.0855 Solid BC 1.42	FFEP .228	2 FOIL + 90% 2 TC 1.4	KYNAR .347	25.0	84%	50	10 0.52
ETHERNET **DEC #(17-00451)** **IEEE 802.3**  **CL2 ℛ1478**	**3250**	.0855 Solid BC 1.42	FP .247	2-FOIL + 90% 2 TC 1.5	PVC .405	26.0	78%	50	10 0.52 50 1.20 150 2.00 300 3.10 400 3.60
THINWIRE ETHERNET **DEC #(17-01246)**  **CL2P**	**2104** **2104K**	20 19/32 (.037) TC 9.0	FFEP .101	FOIL + 93% TC 4.23	FEP or KYNAR .166	26.2	78%	50	5 0.99 10 1.40
THINWIRE ETHERNET **DEC #(17-01248)** **CL2**	**3104**	20 19/32 (.037) TC 9.0	FP .101	FOIL + 95% TC 4.23	PVC .184 (Gray)	26.2	78%	50	5 0.99 10 1.40
RG58 C/U **IEEE 802.3 THINNET**  **CL2P**	**2135** **2135K**	20 19/33 TC 10.0	FEP .116	95% TC 4.1	FEP or KYNAR .174	29.5	69.5%	50	5 0.80 10 1.20
RG58 A/U MIL-C-17 **IEEE 802.3 THINNET** **CL2**	**3135**	20 19/33 TC 10.0	PE .116	95% TC 4.1	PVC .195	30.5	66%	50	5 0.80 10 1.20

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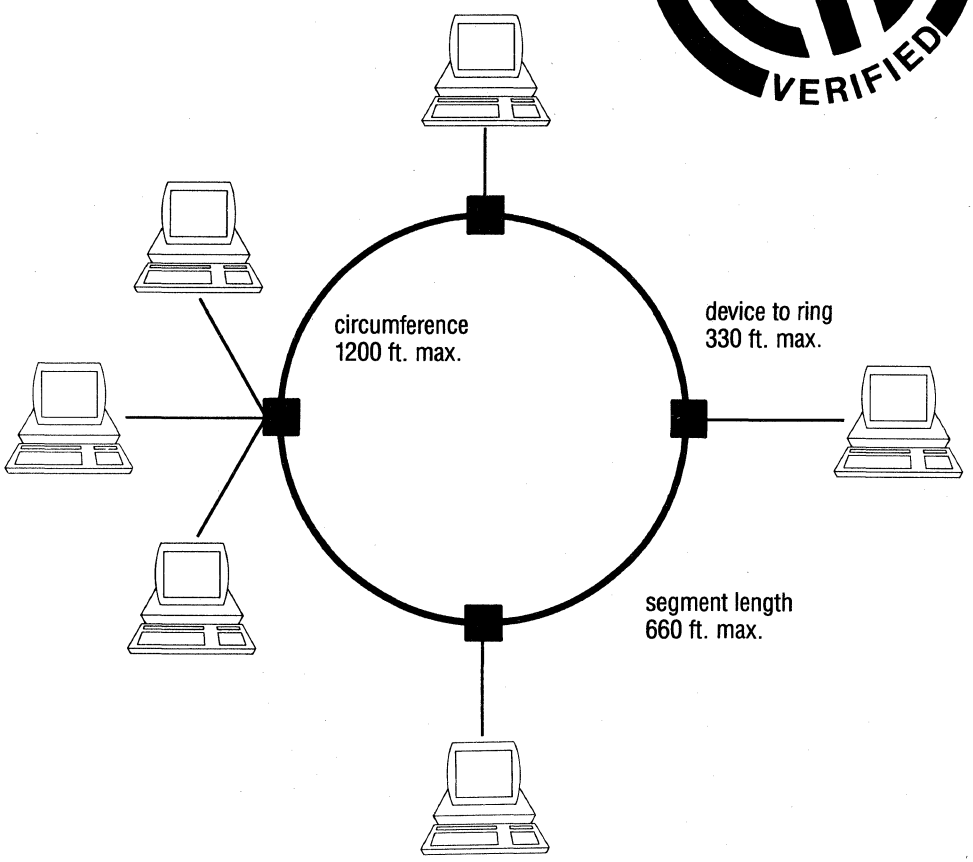
Recommended IBM*Token Ring Cables (IEEE 802.5)

Comm/Scope, Inc.
NETWORK CABLE DIVISION



Comm/Scope IBM token ring cables have been verified for use with IBM systems by ETL.

Comm/Scope IBM token ring cables
#4901 Type 1 plenum or
#9901 Type 1 nonplenum (data only)
#4902 Type 2 plenum or
#9902 Type 1 nonplenum (data & voice)
#4903 Type 3 plenum (voice only)
#4909 Type 9 plenum (short run only)

NOTE: The dimensions and statistics given here are for reference only and may vary depending upon your particular application.

*IBM is a registered trademark of IBM, Inc.

Recommended IBM*Token Ring Cables (IEEE 802.5)

Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION QUALIFICATIONS	PART NUMBER	NO. OF CONDUCTORS AWG WIRE TYPE	INSULATION	DATA PAIR SHIELD CONSTRUCTION	NOMINAL JACKET O.D. IN INCHES	NOM. IMP. (OHMS)	MAXIMUM ATTENUATION MHz / db/km
TYPE I PLENUM **#4716749** **CL2P**	**4901**	2 Data Pairs 22 AWG Solid Copper	FFEP	Individual FOIL + 65% TC Overall	PVDF .365	Data 150@ 1-20 MHz	4 22 16 45
TYPE I NONPLENUM **#4716748, #6339585** **CMR**	**9901**	2 Data Pairs 22 AWG Solid Copper	Flame retardant foam PE	Individual FOIL + 65% TC Overall	PVC .385	Data 150@ 1-20 MHz	4 22 16 45
TYPE II PLENUM **#4716738** **CMP**	**4902**	2 Data Pairs 22 AWG Solid Copper 4 Voice Pairs 22 AWG Solid Copper	FFEP FEP	Individual FOIL + 65% TC Overall No Voice Shielding	PVDF .440	150 @ 1-20 MHz Voice 100@ 4 MHz	Data 4 22 16 45 Voice .256 13.12 1 26.24
TYPE II NONPLENUM **#4716739** **CMR**	**9902**	2 Data Pairs 22 AWG Solid Copper 4 Voice Pairs 22 AWG Solid Copper	Flame retardant foam PE FEP	Individual FOIL + 65% TC Overall	PVC .460	150 @ 1-20 MHz Voice 100@ 4 MHz	Data 4 22 16 45 Voice .256 13.12 1 26.24
TYPE III VOICE GRADE **#TYPE 3 TELEPHONE** **CMP**	**4903**	4 Voice Pairs 22 AWG Solid Copper	FEP	No Shielding	PVDF .238	Voice 105@ 256 KHz 100@ 4 MHz	Voice .150 7.13 .256 13.12 .772 16.82 1 26.24
TYPE 9 PLENUM **#6339583** **CL2P**	**4909**	2 Data Pairs 26 AWG Solid Copper	FFEP	Individual FOIL + 65% TC Overall	PVDF .250	Data 150@ 1-20 MHz	Data 4 33 16 66

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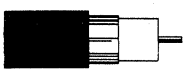
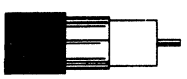
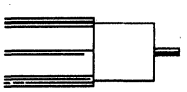
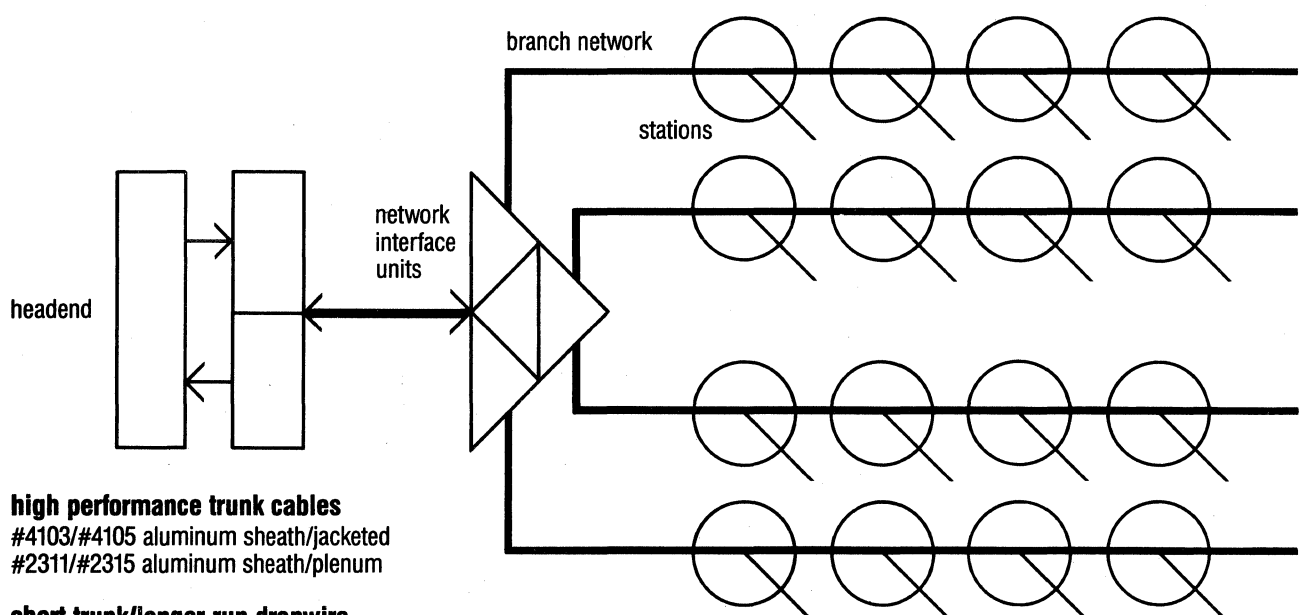
Recommended Cables for Broadband Networks (IEEE 802.7)

Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION / QUALIFICATIONS	PART NUMBER	CENTER CONDUCTOR AWG OR DIA. IN IN. / WIRE TYPE / NOM DCR OHMS/1000'	DIELECTRIC NOM O.D. IN INCHES	SHIELD CONSTRUCTION / NOM DCR OHMS/1000'	JACKET & NOM O.D. IN INCHES	NOM CAP. PI/Ft	NOM VEL. OF PROP.	NOM IMP. (OHMS)	NOMINAL ATTENUATION MHz / db/100'
QR® QUANTUM REACH .540 MAP/TOP CARRIER BAND 	**4103**	.124 Solid CCAL 1.0	FP .513	ALS .540 0.59	PE .610	15.3	88%	75	5 0.14 10 0.20 20 0.28 100 0.64 450 1.41
QR® .860 MAP/TOP CARRIER BAND 	**4105**	.203 Solid CCAL 0.4	FP .828	ALS .860 0.32	PE .960	15.3	88%	75	5 0.09 10 0.13 20 0.18 100 0.45 450 0.95
.500 PLENUM TRUNK  **CL2P & CATVP**	**2311**	.109 Solid CCAL 1.32	FFEP .450	ALS .500 20.4	N/A	16.4	86%	75	5 0.17 50 0.58 100 0.86 200 1.29 300 1.67 450 2.16



high performance trunk cables
#4103/#4105 aluminum sheath/jacketed
#2311/#2315 aluminum sheath/plenum

short trunk/longer run dropwire
#2285 plenum
#5913 nonplenum

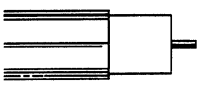
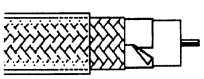
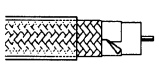
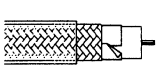
medium run dropwire
#2275 plenum
#5726 nonplenum

short run dropwire
#2020 plenum
#5572 nonplenum

"K" after the part number indicates a KYNAR jacket.
No initial indicates a FEP (Teflon) jacket.

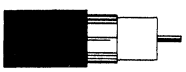
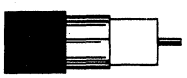
Recommended Cables for Broadband Networks (IEEE 802.7)

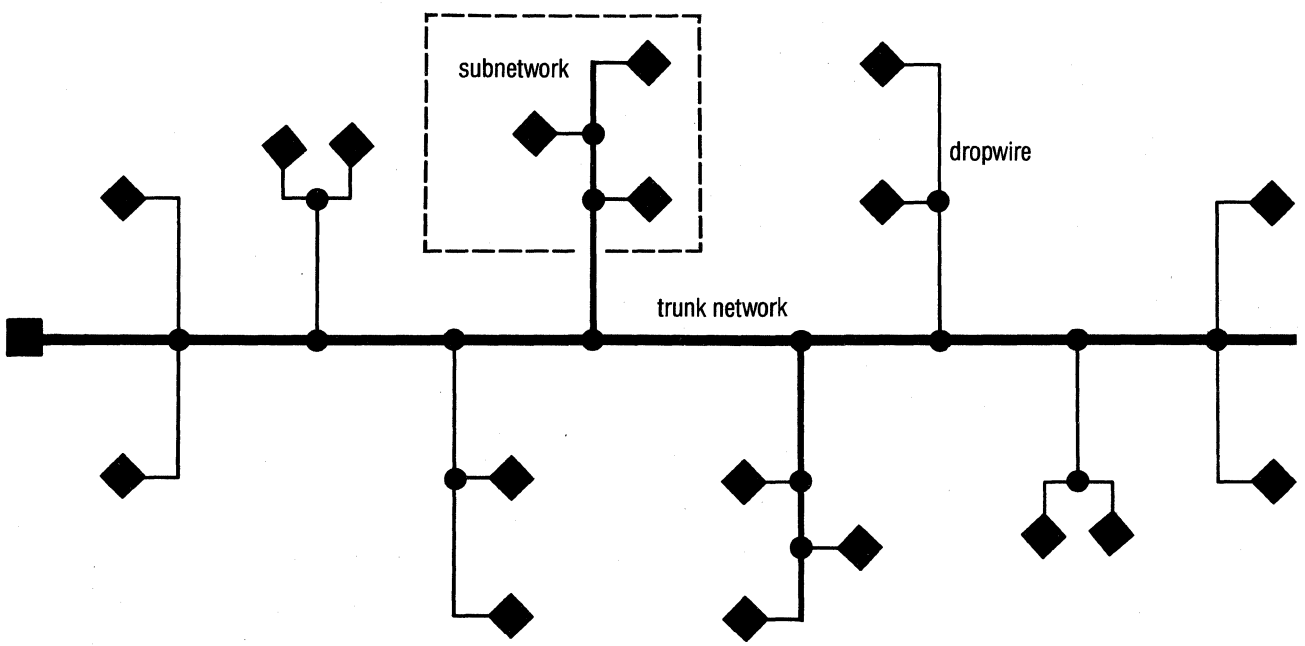
Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION / QUALIFICATIONS	PART NUMBER	CENTER CONDUCTOR AWG OR DIA. IN IN. / WIRE TYPE / NOM DCR OHMS/1000'	DIELECTRIC NOM O.D. IN INCHES	SHIELD CONSTRUCTION / NOM DCR OHMS/1000'	JACKET & NOM O.D. IN INCHES	NOM CAP. PF/Ft	NOM VEL. OF PROP.	NOM IMP. (OHMS)	NOMINAL ATTENUATION MHz / db/100'
.625 PLENUM TRUNK  **CL2P & CATVP**	**2315**	.137 Solid CCAL 0.56	FFEP .563	ALS .625 0.23	N/A	16.4	86%	75	5 0.10 50 0.43 100 0.68 200 1.08 300 1.44 450 1.96
RG11 MATV  **CL2P & CATVP**	**2285** **2285K**	14 Solid CCS 6.4	FFEP .280	FOIL + 60% AL 7.1	FEP or KYNAR .351	16.0	84%	75	5 0.34 55 1.06 83 1.31 211 2.19 300 2.68 400 3.24 450 3.51
RG 11 MATV **CL2**	**5913**	14 Solid CCS 14.29	FP .280	FOIL + 60% AL 7.1	PVC .405	16.2	82%	75	5 .35 50 .94 100 1.28 200 1.78 300 2.20 400 2.57 450 2.75
RG6 MATV  **CL2P & CATVP**	**2275** **2275K**	18 Solid CCS 16.3	FFEP .180	FOIL + 60% AL 9.0	FEP or KYNAR .251	15.8	84%	75	5 0.53 50 1.50 100 2.06 200 2.97 300 3.77 400 4.52 450 4.86
RG6 MATV **CL2**	**5726**	18 Solid CCS 35.5	FP .180	FOIL + 60% AL 9.0	PVC .272	16.2	82%	75	5 .65 50 1.44 100 1.98 200 2.75 300 3.35 400 3.95 450 4.21
RG59 MATV  **CL2P & CATVP**	**2020** **2020K**	20 Solid CCS 25.9	FFEP .144	FOIL + 67% AL 10.3	FEP or KYNAR .207	16.9	82%	75	5 0.65 50 1.88 100 2.57 211 3.70 300 4.62 400 5.49 450 5.88
RG59 MATV **CL2**	**5572**	20 Solid CCS 56.4	FP .146	FOIL + 67% AL 10.5	PVC .242	16.2	82%	75	5 0.88 50 1.80 100 2.48 200 3.45 300 4.26 400 4.97 450 5.30

Recommended Cables for MAP/TOP (IEEE 802.4)

Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION / QUALIFICATIONS	PART NUMBER	CENTER CONDUCTOR AWG OR DIA. IN IN. / WIRE TYPE / NOM DCR OHMS/1000'	DIELECTRIC NOM O.D. IN INCHES	SHIELD CONSTRUCTION / NOM DCR OHMS/1000'	JACKET & NOM O.D. IN INCHES	NOM CAP. Pf/Ft	NOM VEL. OF PROP.	NOM IMP. (OHMS)	NOMINAL ATTENUATION MHz / db/100'
QR® QUANTUM REACH .540 MAP/TOP CARRIER BAND 	**4103**	.124 Solid CCAL 1.0	FP .537	ALS .540 0.59	PE .510	15.3	88%	75	5 0.14 10 0.20 20 0.28 100 0.64 450 1.41
QR®/.860 MAP/TOP CARRIER BAND 	**4105**	.203 Solid CCAL 0.4	FP .855	ALS .860 0.32	PE .960	15.3	88%	75	5 0.09 10 0.13 20 0.18 100 0.45 450 0.95



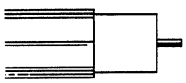
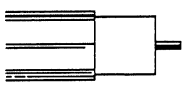
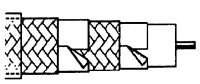
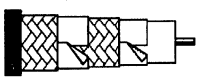
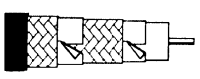
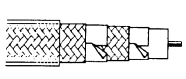
high performance trunk cables
#4103/#4105 aluminum sheath/jacketed
#2311/#2315 aluminum sheath/plenum
#5955 armored/quad shielded
#2288 quad shielded/plenum
#5950 quad shielded/nonplenum

dropwire cables
#2228 quad shielded/plenum
#5750 quad shielded/nonplenum

"K" after the part number indicates a KYNAR jacket.
No initial indicates a FEP (Teflon) jacket.

Recommended Cables for MAP/TOP (IEEE 802.4)

Comm/Scope, Inc.
NETWORK CABLE DIVISION

PRODUCT DESCRIPTION / QUALIFICATIONS	PART NUMBER	CENTER CONDUCTOR AWG OR DIA. IN IN. / WIRE TYPE / NOM DCR OHMS/1000′	DIELECTRIC NOM O.D. IN INCHES	SHIELD CONSTRUCTION / NOM DCR OHMS/1000′	JACKET & NOM O.D. IN INCHES	NOM CAP. PI/FI	NOM VEL. OF PROP.	NOM IMP. (OHMS)	NOMINAL ATTENUATION MHz	db/100′
.500 PLENUM TRUNK  **CL2P & CATVP**	**2311**	.109 Solid CCAL 1.32	FFEP .450	ALS .500 20.4	N/A	16.4	86%	75	5 50 100 200 300 450	0.17 0.58 0.86 1.29 1.67 2.16
.625 PLENUM TRUNK  **CL2P & CATVP**	**2315**	.137 Solid CCAL 0.56	FFEP .563	ALS .625 0.23	N/A	16.4	86%	75	5 50 100 200 300 450	0.10 0.43 0.68 1.08 1.44 1.96
RG11 QUAD SHIELD MAP/TOP CARRIER BAND  **CL2P**	**2288** **2288K**	14 Solid CCS 6.4	FFEP .280	2 FOILS + 60% AL 60% AL 3.7	FEP .378 KYNAR .372	16.0	84%	75	5 10 20 100 450	0.34 0.47 0.65 1.42 3.51
MAP/TOP CARRIER BAND RG11 QUAD SHIELD  **CL2**	**5950**	14 Solid CCS 14.29	FP .280	2 FOILS + 40% 1 AL 60% 1 AL	PVC .405	16.0	84%	75	5 10 20 100 450	.35 0.45 0.63 1.28 2.75
MAP/TOP RG11 CARRIER BAND  **CL2**	**5951**	14 Solid CCS 14.3	FP .273	2 FOILS + 40% 1 AL 60% 1 AL	PVC .405	16.0	84%	75	5 10 20 100 450	.27 .37 .54 1.33 2.76
RG6 QUAD SHIELD MAP/TOP  **CL2P**	**2228** **2228K**	18 Solid CCS 16.3	FFEP .180	2 FOILS + 60% 1-AL 60% 1-AL 5.26	FEP or KYNAR .264	15.8	84%	75	5 10 20 100 450	0.53 0.72 0.99 2.06 4.86
MAP/TOP RG6 QUAD SHIELD **CL2**	**5750**	18 Solid CCS 35.5	FP .180	2 FOILS + 60% 1 AL 40% 1 AL 5.26	PVC .302	16.2	82%	75	5 10 20 100 450	0.65 0.76 0.96 1.98 4.21

Comm/Scope, Inc. Network Cable Division • PO Box 1729 • 1375 Lenoir-Rhyne Blvd. • Hickory, NC 28602 • (800) 982-1708 • (704) 324-2200 • FAX (704) 328-3400

Consolidated electronic wire & cable

Computer Cable

"LOW-CAP" CABLE (UL) CL2 STYLE 2919

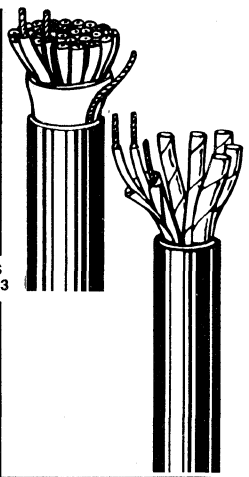
Stranded tinned copper conductors. Color coded foamed polypropylene aluminum foil shield and stranded tin copper drain, plus 65% coverage tin copper braid shield. Gray PVC outer jacket. **Temperature Range:** −20°C. to +80°C. Meets RS-422 requirements. Low distortion data handling. Low dielectric constant. **Applications:** computer; data; FCC Docket 20780 Class A and B.

"LOW-CAP" INSULATED OVERALL FOIL AND BRAID MULTI-PAIR CABLE

Consolidated Number	Pairs No.	Size	Strand	Jacket Wall	O.A. Dia.	Cap. pF Ft.
5755	2	24	7.32	.035	.290	12.5
5756	3	24	7.32	.035	.305	12.5
5757	4	24	7.32	.035	.330	12.5
5758	5	24	7.32	.035	.340	12.5
5759	6	24	7.32	.035	.370	12.5
5760	7	24	7.32	.035	.380	12.5
5761	8	24	7.32	.035	.410	12.5
5762	10	24	7.32	.045	.460	12.5
5763	12½	24	7.32	.045	.480	12.5
5764	15	24	7.32	.045	.540	12.5
5765	18	24	7.32	.045	.570	12.5
5766	25	24	7.32	.050	.650	12.5

"LOW-CAP" INSULATED INDIVIDUAL SHIELDED PLUS OVERALL FOIL AND BRAID MULTI-PAIR CABLE UL2493

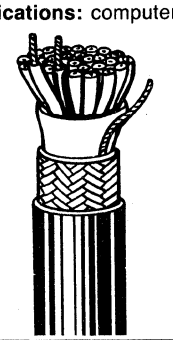
5390	2	24	7.32	.040	.376	12.5
5380	3	24	7.32	.040	.396	12.5
5381	4	24	7.32	.045	.430	12.5
5382	5	24	7.32	.060	.460	12.5
5383	6	24	7.32	.060	.495	12.5
5384	7	24	7.32	.060	.500	12.5
5385	8	24	7.32	.060	.575	12.5
5386	10	24	7.32	.060	.650	12.5
5387	15	24	7.32	.060	.720	12.5
5388	19	24	7.32	.060	.770	12.5
5389	25	24	7.32	.060	.935	12.5



OVERALL FOIL AND BRAID MULTIPAIR CABLE SUITABLE FOR RS 422 APPLICATION (UL) CL2

Stranded tinned copper conductors. Color coded polyethylene insulation. Conductors are cabled into pairs. Overall aluminum foil shield with stranded tin copper drain, plus 90% coverage tin copper braid shield. Gray PVC outer jacket. **Temperature Range:** −20°C. to +80°C. UL 2919 30 Volts. Low dielectric constant. Low distortion data handling. Meets RS-422 requirements. **Applications:** computer; data.

Consolidated Number	Pairs No.	Size	Strand	Jacket Wall	O.A. Dia.	Cap. pF Ft.
5980	2	24	7.32	.035	.300	15.5
5981	3	24	7.32	.035	.310	15.5
5982	4	24	7.32	.035	.330	15.5
5983	5	24	7.32	.035	.350	15.5
5984	7	24	7.32	.035	.370	15.5
5985	9	24	7.32	.035	.420	15.5
5986	10	24	7.32	.045	.450	15.5
5987	12	24	7.32	.045	.470	15.5
5988	18	24	7.32	.045	.570	15.5
5989	25	24	7.32	.050	.660	15.5
5990	1	24	7.32	.035	.270	12.8
5991	2	24	7.32	.035	.355	12.8
5992	3	24	7.32	.035	.370	12.8
5993	4	24	7.32	.035	.395	12.8



OVERALL FOIL SHIELD AND BRAID MULTICONDUCTOR CABLE (UL) CL2

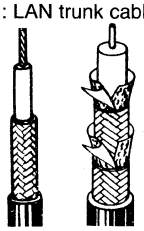
Stranded tinned copper conductors. Color coded semi-rigid PVC insulation. Conductors are cabled. Overall Mylar aluminum foil shield plus 70% coverage tin copper braid shield. Gray PVC outer jacket. **Temperature Range:** −20°C. to +80°C. UL 2464 300 Volts. Passes UL VW-1. Meets FCC requirements. Docket 20780 class A and B. **Applications:** computer; data.

Consolidated Number	Conductors No.	Size	Strand	Ins. Wall	Jacket Wall	O.A. Dia.	Cap. pF Ft.
5850	2	24	7.32	.010	.035	.180	35
5851	3	24	7.32	.010	.035	.190	35
5852	4	24	7.32	.010	.035	.200	35
5862	5	24	7.32	.010	.035	.210	35
5853	6	24	7.32	.010	.035	.225	30
5863	7	24	7.32	.010	.035	.230	30
5854	8	24	7.32	.010	.035	.240	30
5864	9	24	7.32	.010	.035	.255	30
5855	10	24	7.32	.010	.035	.270	30
5856	15	24	7.32	.010	.035	.300	30
5857	20	24	7.32	.010	.040	.330	30
5858	25	24	7.32	.010	.040	.370	30
5859	30	24	7.32	.010	.040	.385	30
5865	37	24	7.32	.010	.040	.410	30
5860	40	24	7.32	.010	.040	.435	30
5861	50	24	7.32	.010	.045	.485	30
5870	2	22	7.30	.010	.035	.190	37
5871	3	22	7.30	.010	.035	.202	37
5872	4	22	7.30	.010	.035	.215	37
5882	5	22	7.30	.010	.035	.230	37
5873	6	22	7.30	.010	.035	.245	35
5883	7	22	7.30	.010	.035	.250	35
5874	8	22	7.30	.010	.035	.260	35
5884	9	22	7.30	.010	.035	.280	35
5875	10	22	7.30	.010	.035	.300	35
5876	15	22	7.30	.010	.035	.335	35
5877	20	22	7.30	.010	.035	.375	35
5878	25	22	7.30	.010	.040	.410	35
5879	30	22	7.30	.010	.040	.435	35
5885	37	22	7.30	.010	.040	.460	35
5880	40	22	7.30	.010	.040	.475	35
5881	50	22	7.30	.010	.045	.555	35

LOCAL AREA NETWORK TRUNK COAXIAL CABLES (UL) CL2

Solid bare copper center conductor. Cellular polyethylene dielectric. Shield construction: Mylar aluminum foil shield, plus 92% tin copper braid (4880); Mylar aluminum foil shield plus 60% aluminum braid (4585). 4880 has yellow PVC outer jacket. 4585 has black PVC outer jacket. **Applications:** Local Area Networks (LAN): LAN trunk cable: computer; data; information handling.

Consolidated Number	Shield Construction	Imp. Ohms	Gauge & Strand	Core O.D.	O.A. Dia.	Cap. pF Ft.
4880	Ethernet	50	12 AWG	.247	.405	26
4585	6 U Type	75	18 Solid	N/A	.262	17.3

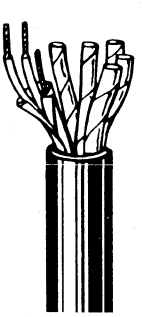


INDIVIDUALLY SHIELDED PAIR CABLE (UL) CL2

Stranded, tinned copper conductors. Color-coded polypropylene insulation; color codes available on request. Conductors twisted into pairs. Each pair individually shielded with Mylar† polyester reinforced aluminum facing inward. Shields are electrically isolated from each other. Stranded, tinned copper drain wire, each pair. Gray PVC outer jacket. **Temperature Range:** −40°C to +105°C. **Applications:** Audio, data, broadcast sound, instrumentation.

Cat. No.	No. of Pairs	Insul. Wall in.	Jacket Wall in.	Overall Dia. in.	Rated Volts	Cap. pF/ft.*
22 (7 × 30) STRANDED—UL STYLE 2493						
5594	2	.010	.020	.165	300	35
5323	3	.010	.030	.265	300	30
5326	6	.010	.037	.355	300	30
5329	9	.010	.040	.425	300	30
5331	11	.010	.040	.455	300	30
5332	12	.010	.040	.465	300	30
5335	15	.010	.045	.525	300	30
5339	19	.010	.050	.575	300	30
5347	27	.010	.070	.705	300	30
20 (10 × 30) STRANDED—UL STYLE 2493						
5573	1	.015	.025	.200	300	35
5363	3	.013	.048	.355	300	35

Cat. No.	No. of Pairs	Insul. Wall in.	Jacket Wall in.	Overall Dia. in.	Rated Volts	Cap. pF/ft.*
20 (10 × 30) STRANDED—UL STYLE 2493—Continued						
5366	6	.013	.048	.470	300	35
5369	9	.013	.065	.550	300	35
5371	11	.013	.065	.580	300	35
5372	12	.013	.065	.600	300	35
5375	15	.013	.065	.650	300	35
18 (16 × 30) STRANDED—UL STYLE 2493						
5574	1	.018	.025	.200	400	50
5353	3	.016	.045	.405	400	30
5356	6	.016	.055	.575	400	30
5359	9	.016	.065	.660	400	30
5362	12	.016	.070	.765	400	30
5365	15	.016	.070	.820	400	30



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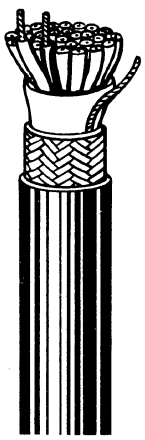
Consolidated electronic wire & cable

Computer Cable

OVERALL FOIL SHIELD AND BRAID MULTICONDUCTOR CABLE (UL) CL2

Stranded tinned copper conductors. Color coded semi-rigid PVC insulation. Conductors are cabled. Overall Mylar™/aluminum foil shield plus 70% coverage tin copper braid shield. Gray PVC outer jacket. **Temperature Range:** 20°C. to +80°C (UL +80°C). CSA-SR-PVC. Passes UL 2464. Meets FCC requirements Docket 20780 Class A and B. **Applications:** computer, data. **Trademark:** Mylar of DuPont.

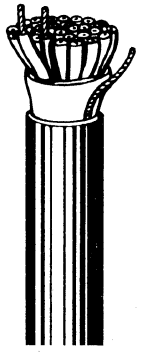
Consolidated Number	Pairs			Ins. Wall	Jacket Wall	O.A. Dia.	Cap. pF/Ft.
	No.	Size	Strand				
5940	1	24	7/32	.010	.032	.180	35
5941	2	24	7/32	.010	.032	.250	35
5942	3	24	7/32	.010	.032	.265	30
5943	4	24	7/32	.010	.032	.290	30
5944	5	24	7/32	.010	.035	.295	30
5945	6	24	7/32	.010	.035	.311	30
5952	7	24	7/32	.010	.035	.320	30
5953	8	24	7/32	.010	.035	.335	30
5946	9	24	7/32	.010	.035	.370	30
5954	10	24	7/32	.010	.040	.385	30
5947	11	24	7/32	.010	.040	.395	30
5955	12½	24	7/32	.010	.040	.405	30
5948	15	24	7/32	.010	.040	.445	30
5956	18	24	7/32	.010	.040	.480	30
5949	19	24	7/32	.010	.040	.492	30
5957	25	24	7/32	.010	.045	.550	30
5950	27	24	7/32	.010	.045	.580	30
5951	51	24	7/32	.010	.050	.745	30
5960	1	22	7/30	.010	.032	.192	40
5961	2	22	7/30	.010	.032	.265	40
5962	3	22	7/30	.010	.032	.290	35
5963	4	22	7/30	.010	.032	.318	35
5964	5	22	7/30	.010	.035	.322	35
5965	6	22	7/30	.010	.035	.345	35
5972	7	22	7/30	.010	.035	.365	35
5973	8	22	7/30	.010	.035	.384	35
5966	9	22	7/30	.010	.035	.408	35
5974	10	22	7/30	.010	.040	.430	35
5967	11	22	7/30	.010	.040	.440	35
5975	12½	22	7/30	.010	.040	.455	35
5968	15	22	7/30	.010	.040	.502	35
5976	18	22	7/30	.010	.040	.535	35
5969	19	22	7/30	.010	.040	.545	35
5977	25	22	7/30	.010	.045	.620	35
5970	27	22	7/30	.010	.045	.655	35
5971	51	22	7/30	.010	.050	.885	35



OVERALL SHIELDED CABLE RS 232C (UL) CL2

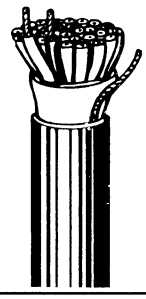
Color coded semi-rigid PVC insulation. Conductors are cabled and twisted into pairs where applicable. Overall Mylar/aluminum foil shield and stranded tinned copper drain wire. Gray PVC jacket. **Temperature Range:** −20°C. to +80°C. (UL +80°C). UL 2464 300V. CSA-SR-PVC. Meets RS 232C. **Applications:** computer; data.

Consolidated Number	Conductors			Ins. Wall	Jacket Wall	O.A. Dia.	Cap. pF/Ft.
	No.	Size	Strand				
5722	2	22	7/30	.010	.025	.170	35
5723	3	22	7/30	.010	.035	.185	35
5724	4	22	7/30	.010	.035	.200	35
5731	5	22	7/30	.010	.035	.210	35
5726	6	22	7/30	.010	.035	.230	35
5727	7	22	7/30	.010	.035	.240	35
5728	8	22	7/30	.010	.035	.245	35
5729	9	22	7/30	.010	.035	.258	35
5732	10	22	7/30	.010	.035	.275	35
5735	15	22	7/30	.010	.035	.305	35
5736	20	22	7/30	.010	.035	.345	35
5737	25	22	7/30	.010	.040	.400	35
5738	30	22	7/30	.010	.040	.420	35
5739	40	22	7/30	.010	.040	.465	35
5741	50	22	7/30	.010	.045	.505	35
5710	2	24	7/32	.010	.035	.168	30
5711	3	24	7/32	.010	.035	.172	30
5712	4	24	7/32	.010	.035	.180	30
5713	5	24	7/32	.010	.035	.190	30
5714	6	24	7/32	.010	.035	.205	30
5715	7	24	7/32	.010	.035	.205	30
5716	8	24	7/32	.010	.035	.220	30
5717	9	24	7/32	.010	.035	.240	30
5718	10	24	7/32	.010	.035	.250	30
5719	15	24	7/32	.010	.035	.280	30
5720	20	24	7/32	.010	.035	.310	30
5725	25	24	7/32	.010	.040	.370	30
5730	30	24	7/32	.010	.040	.390	30
5740	40	24	7/32	.010	.040	.440	30
5750	50	24	7/32	.010	.045	.490	30



SHIELDED MULTIPAIR CABLE RS 232C (UL) CL2

Consolidated Number	Pairs			Ins. Wall	Jacket Wall	O.A. Dia.	Cap. pF/Ft.
	No.	Size	Strand				
5771	1	24	7/32	.010	.032	.156	40
5772	2	24	7/32	.010	.032	.222	30
5773	3	24	7/32	.010	.032	.232	30
5774	4	24	7/32	.010	.032	.265	30
5775	5	24	7/32	.010	.035	.295	30
5776	6	24	7/32	.010	.035	.295	30
5777	7	24	7/32	.010	.035	.300	30
5778	8	24	7/32	.010	.035	.330	30
5779	9	24	7/32	.010	.035	.340	30
5780	10	24	7/32	.010	.040	.380	30
5785	15	24	7/32	.010	.040	.425	30
5789	19	24	7/32	.010	.040	.450	30
5790	25	24	7/32	.010	.045	.515	30
5791	50	24	7/32	.010	.050	.700	30



COAXIAL COMPUTER CABLE (UL) CL2

Solid Copperweld™ (CW), stranded CW, or stranded copper conductors. Solid PE, foam PE, air foam "FEP" Teflon™. Overall bare copper braid shield. Non-contaminating black PVC or (4479) "FEP" Teflon outer jacket. **Temperature:** −20°C. to +80°C. Poly PVC. **Temperature:** −40°C. to +200°C. FEP Teflon. **Applications:** computer, data transmission. **Trademarks:** Teflon of DuPont and Copperweld of Copperweld Steel Co.

Consolidated Number	RG Type	Imp. Ohms	Center Conductor		Nom. O.D.	V.P. %	Cap. pF/Ft.
			Size	Strand			
4414	59 U	75	22	7/30	.242	78	17.3
4452	62 U	93	22	solid	.242	84	13.5
4456	62A U	93	22	(solid)	.242	84	13.5
4499	62A U	93	22	(solid)	.260	80	14.5
4472	62B U	93	24	7/32	.242	84	13.5
4479	62A U	93	22	(solid)	.216	85	14.5

TWIN COAXIAL WANG STYLE WORD PROCESSING CABLE (UL) CL2

(4599) Solid bare CW conductors. Solid polyethylene insulation. Overall bare copper braid shield. Conductors laid parallel. Figure "eight" construction with black noncontaminating PVC jacket. **Temperature Range:** −20°C. to +80°C. **Applications:** computer; data; word processing cable.

(4799) Solid bare CW conductors. FEP Teflon™ insulation. Overall bare copper braid shield. Conductors laid parallel. Figure "eight" construction. FEP Teflon outer jacket. **Temperature Range:** −40°C. to +200°C. UL Listed-Subject 13. NEC Article 725-2(b). **Applications:** Computer; data; word processing cable.

Consolidated Number	RG Type	Imp. Ohms	Center Conductor		Nom. O.D.	V.P. %	Cap. pF/Ft.
			Size	Strand			
4599	59B U	75	22	(solid)	.250 .595	66	20.5
4799	59B U	75	22	(solid)	.206 .450	70	19.7

TWINAXIAL DATA CABLE

Stranded copper or bare copper conductors. Color coded polyethylene insulation. Color coded PVC outer jacket. **Temperature Range:** −20°C. to +60°C. (UL +60°C). UL 2092, UL2582. No crosstalk. UL 2498. UL 2772. Balanced line operation. **Applications:** data transmission; broadcast.

Consolidated Number	RG UL Type	Imp. Ohms	Center Conductors			Nom. O.D.	V.P. %	Cap. pF/Ft.
			No.	Size	Strand			
4591	2092	78	2	20	7/28	.242	66	19.7
4465	108A U	78	2	20	7/28	.235	66	23.5
4598	2582	78	2	20	7/28	.243	66	19.7
4475	22B U	95	2	18	7/26	.420	66	16.0
4592	2498	100	2	20	7/28	.330	66	15.5
4594	2092	124	2	25	7/33	.242	66	12.2
4596	2772	150	2	22	19/34	.350	78	8.8

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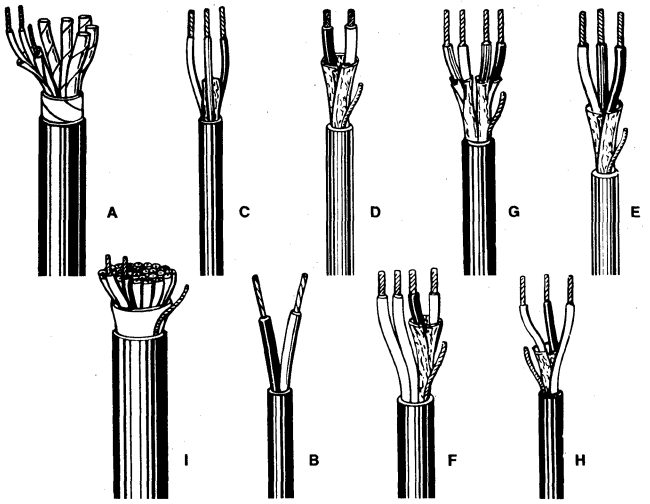
Multiconductor Cables



PVC JACKETED 2-PAIR & 3-COND. CABLES

Stranded, tinned copper conductors. Color coded polyethylene (PE), polypropylene (polyp) or polyvinylchloride (PVC) insulation: color codes available upon request. Conductors shielded. Mylar† polyester reinforced aluminum foil shield overall. Tinned copper drain wire. Gray PVC jacket. **Temperature Range:** −20°C to +80°C (UL to +80°C). **Voltage Rating:** 300 V.

Cat. No.	Gauge and Strand	Insulation Wall In.	Insulation Wall Type	Jacket Wall In.	Overall Dia. In.	Cap. pF/ft.*
INDIVIDUALLY SHIELDED 2-PAIR CABLES (FIG. G)—UL LISTED						
5594	22 (7×30)	.008	Polyp.	.019	.165	35
5592#	22 (7×30)	.008	Polyp.	.030	.198	35
ONE PAIR SHIELDED, ONE PAIR UNSHIELDED (FIG. F)—UL LISTED						
5571	22 (7×30)	.009	PE	.019	.185	34
5595	20 (7×28)	.015	PE	.028	.230	42
3-COND. CABLES—ONE PAIR SHIELDED ONE COND. UNSHIELDED (FIG. H)						
5701	22 (7×30)	.013	PVC	.032	.199	28
5702	20 (7×28)	.014	PE	.028	.210	26

*Capacitance between conductors and shield. #Same as No. 5594, but with addition of an overall Mylar† polyester reinforced aluminum foil shield and 24 AWG stranded, tinned copper drain wire.

"LOW-CAP" INDIVIDUALLY SHIELDED PAIR COMPUTER CABLE (FIG. A)

(Meets EIA RS-422B Type Requirements)

Stranded, tinned copper conductors. Color-coded "Low-Cap" foamed polypropylene insulation. Conductors are cabled. Each pair shielded with Mylar† polyester reinforced aluminum foil and contains stranded, tinned copper drain wire. Overall Mylar† polyester reinforced aluminum foil shield with stranded, tinned copper drain wire. Black PVC jacket. **Temperature Range:** −20°C to +80°C. UL Listed, Style 2493. **Voltage Range:** 300 V.

Cat. No.	No. of Pairs	Gauge and Strand	Overall Dia. In.	Imp. Ohms	Cap. pF/ft.*
5343	3	24 (7×32)	.350	100	12.5
5346	6	24 (7×32)	.460	100	12.5
5349	9	24 (7×32)	.570	100	12.5
5341	11	24 (7×32)	.610	100	12.5
5342	12	24 (7×32)	.630	100	12.5
5345	15	24 (7×32)	.700	100	12.5
5357	17	24 (7×32)	.730	100	12.5
5340	19	24 (7×32)	.740	100	12.5
5344	27	24 (7×32)	.920	100	12.5

Capacitance between conductors. †Registered Trade Mark of E.I. DuPont de Nemours & Co., Inc.

UL SUBJECT 13 POWER LIMITED TRAY CABLE (UL) CL3

Stranded, tinned copper conductors. Color-coded PVC insulation; color codes available upon request. Overall Mylar† polyester reinforced aluminum foil shield. Stranded, tinner copper drain wire (shielded versions). Gray PVC jacket. **Temperature Range:** −30°C to +105°C. (UL Subject 13 to −105°C). **Voltage Rating:** 300 V. Article 725 NEC. Applicance Wiring Material Style 2464. Certified CSA-IR-64, UL 70,000 BTU Flame and Tray Cable Teat. UL listed as tray and cable. Class 2 and 3 circuits.

Cat. No.	No. of Cond.	Gauge and Strand	Insul. Wall In.	Jacket Wall In.	Overall Dia. In.
UNSHIELDED 2-CONDUCTOR CABLE (FIG. B)					
5001	2	22 (7×30)	.016	.038	.200
5002	2	20 (10×30)	.016	.038	.214
5003	2	18 (16×30)	.016	.038	.230
5004	2	16 (26×30)	.016	.038	.260
5005	2	14 (41×30)	.020	.043	.324
5006	2	12 (65×30)	.032	.053	.410
UNSHIELDED 3-CONDUCTOR CABLE (FIG. C)					
5020	3	22 (7×30)	.016	.038	.210
5021	3	20 (10×30)	.016	.038	.225
5022	3	18 (16×30)	.016	.038	.246
5023	3	16 (26×30)	.016	.038	.274
5024	3	14 (41×30)	.022	.043	.342
SHIELDED 2-CONDUCTOR CABLE (FIG. D)					
5010	2	22 (7×30)	.016	.038	.202
5011	2	20 (10×30)	.016	.038	.216
5012	2	18 (16×30)	.016	.038	.236
5013	2	16 (26×30)	.016	.038	.262
5014	2	14 (41×30)	.022	.043	.326
5015	2	12 (65×30)	.032	.053	.412
SHIELDED 3-CONDUCTOR CABLE (FIG. E)					
5030	3	22 (7×30)	.016	.038	.212
5031	3	20 (10×30)	.016	.038	.227
5032	3	18 (16×30)	.016	.038	.248
5033	3	16 (26×30)	.016	.038	.276
5034	3	14 (41×30)	.020	.043	.344
OVERALL SHIELDED MULTIPLE-PAIR CABLE (FIG. I)					
5040	2	22 (7×30)	.016	.043	.310
5041	3	22 (7×30)	.016	.043	.326
5042	4	22 (7×30)	.016	.043	.353
5043	6	22 (7×30)	.016	.053	.425
5044	9	22 (7×30)	.016	.053	.488
5045	11	22 (7×30)	.016	.053	.536
5046	15	22 (7×30)	.016	.053	.594
5047	19	22 (7×30)	.016	.063	.631
5048	27	22 (7×30)	.016	.063	.761
5049	51	22 (7×30)	.016	.075	.950
5050	2	18 (16×30)	.016	.043	.375
5051	3	18 (26×30)	.016	.053	.416
5052	4	18 (26×30)	.016	.053	.451
5053	6	18 (26×30)	.016	.053	.516
5054	9	18 (26×30)	.016	.053	.576
5055	11	18 (26×30)	.016	.063	.676
5056	15	18 (26×30)	.016	.063	.751
INDIVIDUALLY SHIELDED-PAIR CABLE (FIG. A)					
5060	2	22 (7×30)	.016	.043	.316
5061	3	22 (7×30)	.016	.043	.331
5062	4	22 (7×30)	.016	.043	.360
5063	6	22 (7×30)	.016	.053	.431
5064	9	22 (7×30)	.016	.053	.500
5065	11	22 (7×30)	.016	.053	.551
5066	15	22 (7×30)	.016	.053	.606
5067	19	22 (7×30)	.016	.063	.646
5068	27	22 (7×30)	.016	.063	.776
5069	51	22 (7×30)	.016	.075	.970
5070	2	18 (16×30)	.016	.043	.316
5071	3	18 (16×30)	.016	.053	.421
5072	4	18 (16×30)	.016	.053	.456
5073	6	18 (16×30)	.016	.053	.526
5074	9	18 (16×30)	.016	.063	.628
5075	11	18 (16×30)	.016	.063	.688
5076	15	18 (16×30)	.016	.063	.766

†Registered Trade Mark of E.I. DuPont de Nemours & Co., Inc.

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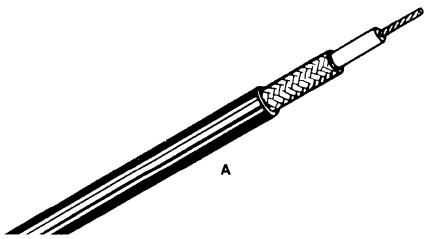
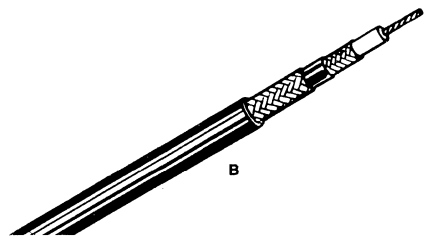
Consolidated electronic wire & cable

Coaxial Cables

RG COAXIAL CABLE TRANSMISSION LINE





RG TYPE POLYETHYLENE COAXIAL CABLE (FIG. A)

Cat. No.	RG Type	Jacket O.D. In.	Jacket Type	Shield‡ Outer	Shield‡ Inner	Insulation Dielectric Dia./Type*	Center Conductor#	V.P. %	Nom. Cap. pF/ft.	Max. RMS Volts	Nom. Imp. Ohms
4433	6A/U	.332	111A	C	C	.185/P	21CW	65.9	20	2700	75
4415	8/U	.405	1	.....	C	.285/P	7/21C	65.9	29.5	4000	52
4435	8A/U	.405	11A	.....	C	.285/P	7/21C	65.9	29.5	4000	52
4419	11/U	.405	1	.....	C	.285/P	7/26TC	65.9	20.5	4000	75
4440	11A/U	.405	11A	.....	C	.285/P	7/26TC	65.9	20.5	4000	75
4443	13A/U	.425	11A	C	C	.285/P	7/26TC	65.9	20.5	4000	75
4482	17A/U	.870	11A	.....	C	.680/P	.188	65.9	29.5	11000	52
4475	22B/U	.420	11A	TC	TC	.285/P	Two 7/.0152C	65.9	16.0	1000	95
4447	55/U	.206	111A	TC	TC	.206/P	20C	65.9	28.5	1900	53.5
4448	55A/U	.216	11A	S	S	.116/P	.035S	65.9	29.5	1900	50
4484	55B/U	.206	111A	TC	TC	.116/P	20S	65.9	28.5	1900	53.5
4405	58/U	.195	1	.....	TC	.116/P	20C	65.9	28.5	1900	53.5
4449	58A/U	.195	1	.....	TC	.116/P	19/0071TC	65.9	29.5	1900	52
4450	58C/U	.195	11A	.....	TC	.116/P	19/0071TC	65.9	29.5	1900	50
4401	59/U	.242	1-Blk.	.....	C	.146/P	22CW	65.9	21	2300	73
4451	59A/U	.242	11A	.....	C	.146/P	.0253CW	65.9	20.5	2300	75
4470	59B/U	.242	11A	.....	C	.146/P	.0253CW	65.9	20.5	2300	75
4452	62/U	.242	1	.....	C	.146/ASP	22CW	84	13.5	750	93
4456	62A/U	.242	11A	.....	C	.146/ASP	22CW	84	13.5	750	93
4472	62B/U	.242	11A	.....	C	.146/ASP	7/32CW	84	13.5	750	93
4454	63/U	.405	1	.....	C	.285/ASP	22CW	84	10.0	1000	125
4455	63B/U	.405	11A	.....	C	.285/ASP	22CW	84	10.0	1000	125
4485	71B/U	.250	111A	TC	TC	.146/ASP	22CW	84	13.5	750	93
4487	79B/U	.475	11A	.....	C	.285/P	22CW	84	10.0	1000	125
4465	108A/U	.235	11A	.....	TC	.235/P	Two 7/28TC	65.9	23.5	1000	78
4457	122/U	.160	11A	.....	TC	.096/P	27/36TC	65.9	29.5	1900	50
4459	174/U	.105	1	.....	TC	.060/P	7/.0063CW	65.9	30	1500	50
4473	174A/U	.105	11A	.....	C	.060/P	7/.0063CW	65.9	30	1500	50
4489	213/U	.405	11A	.....	C	.285/P	7/.0296C	65.9	29.5	5000	50
4490	214/U	.425	11A	S	S	.285/P	7/.0296S	65.9	29.5	5000	50
4497	215/U	.475	11	.....	C	.285/P	7/.029C	65.9	29.5	4000	50
4491	216/U	.425	11A	C	C	.285/P	7/26TC	65.9	20.5	4000	75
4492	217/U	.545	11A	C	C	.370/P	.106C	65.9	29.5	7000	50
4493	218/U	.870	11A	.....	C	.680/P	.195C	65.9	29.5	11000	50
4409	221/U	1.195	11A	.....	C	.910/P	.260C	65.9	29.5	14000	50
4496	223/U	.216	11A	S	S	.116/P	.035S	65.9	29.5	1900	50

‡C—Bare copper; S—Silver copper; TC—Tinned copper. *P—Polyethylene ASP—Air spaced polyethylene. #C—Bare copper; CW—Copperweld; S—Silver copper; TC—Tinned copper. *Also available in 100' and 500' spools except as noted. †Available in 500' and 1000' spools only.

RG TRIAXIAL CABLE—SOLID POLYETHYLENE DIELECTRIC (FIG. B.)

Cat. No.	RG Type	Jacket O.D. In.	Jacket Type	Shield/Shield	Insul. Dielect-ric	Center Conductor*	V.P. %	Nom. Cap. pF/ft.	Max. RMS Volts	Nom. Imp., Ohms
4462	8/U	.480	1	Copper Copper	.285	7/21TC	65.9	29.5	5000	52
4461	11/U	.460	1	Copper Copper	.285	7/26TC	65.9	29.5	5000	75
4463	58A/U	.285	1	TC TC	.116	19.0071TC	65.9	28.5	1900	52
4460	59/U	.335	1	Copper Copper	.146	22CW	65.9	21.0	2300	73

*TC—Tinned copper; CW—Copperweld.

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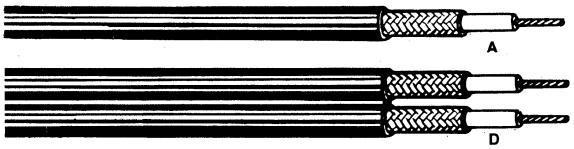
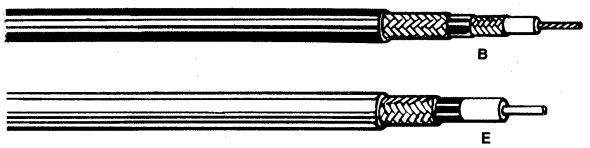
Coaxial Cables





RG COAXIAL CABLE—FOAM POLYETHYLENE DIELECTRIC (FIG. A)

Cat. No.	RG Type	Jacket O.D. In.	Jacket Type	Shield	Insul. Dielect-ric	Center Conductor*	V.P. %	Nom. Cap. pF/ft.	Max. RMS Volts	Nom. Imp. Ohms
4477	8/U	.405	1	Copper	.285	7/21C	80	24.5	1500	50
4476	11/U	.405	1	Copper	.285	14C	80	16.5	1300	75
4498	58/U	.195	1	Copper	.116	20C	80	28.5	1000	53.5
4478	59/U	.242	1	Copper	.146	22CW	80	17.0	1000	75

*C—Copper; CW—Copperweld. *Also available in 100' and 500' spools.

RG TRIAXIAL CABLE—FOAM POLYETHYLENE DIELECTRIC (FIG. B)

Cat. No.	RG Type	Jacket O.D. In.	Jacket Type	Shield/Shield	Insul. Dielect-ric	Center Conductor*	V.P. %	Nom. Cap. pF/ft.	Max. RMS Volts	Nom. Imp. Ohms
4480	11/U	.475	1	Copper/Copper	.285	14C	80	16.5	1300	75
4481	59/U	.335	1	Copper/Copper	.146	22CW	80	17.0	1000	75

*C—Copper; CW—Copperweld. *Also available in 100' and 500' spools.

75-OHM TWIN COAXIAL WANG STYLE WORD PROCESSING CABLE (FIG. D)

Cat. No.	RG Type	Center Conductor	Dielectric	Shield	Shield Cov. %	O.D. In.	Type	V.P. %	Nom. Cap. pF/ft.
UL LISTED, STYLE 20020—POLYETHYLENE DIELECTRIC									
4599	59B/U	2 cond., .0253CW	.146" polyethylene	Copper	95	.250 × .595	11A	66	20.5
UL LISTED, SUBJECT 13—FEP TEFLON† DIELECTRIC (UL) CL2P									
4799	59B/U	2 cond., .0253CW	.135" FEP Teflon†	Copper	95	.206 × .450	FEP Teflon	70	19.7

HIGH TEMPERATURE RG TYPE TEFLON† COAXIAL CABLE (FIG. A)

Solid or stranded center conductors. Bare or silver-plated copper braid; single and double braids. Teflon† dielectrics. **Applications:** RF communications, data transmission, video.

Cat. No.	MIL No. RG-	Center Conductor Size/Mat.#	Dielectric Dia./ Type	Shield(s)†	Jacket O.D. In.	Jacket Type‡	Nom. Cap. pF/ft.	Max. Oper. Volts	Nom. Imp. Ohms
4715	141/U	.039 SPCW	.116 F-1	F	.190	V	28.5	1900	50
4716	141A/U	.039 SCCS	.116 F-1	F	.190	V	28.5	1900	50
4717	142/U	.0359 SCCS	.116 F-1	B	.206	V	28.5	1900	50
4718	142A/U	.039 SCCS	.116 F-1	B	.206	V	28.5	1900	50
4719	142B/U	.039 SCCS	.116 F-1	B	.195	FEP†	28.5	1900	50
4727	178/U	7/.0039 SPCW	.036 F-1	G	.079	KEL-F	27.9	1000	50
4728	178A/U	7/.004 SCCS	.024 F-1	G	.075	KEL-F	27.9	1000	50
4729	178B/U	7/.004 SCCS	.034 F-1	A	.075	FEP†	.....	1000	50
4761	179/U	7/.004 SCCS	.063 F-1	A	.100	KEL-F	.....	1200	75
4730	179A/U	7/.004 SCCS	.063 F-1	G	.105	KEL-F	20.0	1200	75
4731	179B/U	7/.004 SCCS	.063 F-1	A	.105	FEP†	.....	1200	75
4732	180/U	7/.0039 SCCS	.103 F-1	G	.141	KEL-F	15.3	1500	93
4733	180A/U	7/.004 SCCS	.102 F-1	G	.145	KEL-F	14.5	1500	95
4734	180B/U	7/.004 SCCS	.102 F-1	A	.145	FEP†	.....	1500	95
4735	187/U	7/.004 SCCS	.060 F-1	A	.110	Teflon	.....	1200	75
4736	187A/U	7/.004 SCCS	.060 F-1	A	.110	TFE†	.....	1200	75
4737	188/U	7/.0067 SCCS	.060 F-1	A	.110	Teflon	.....	1200	50
4738	188A/U	7/.0067 SCCS	.060 F-1	A	.110	TFE†	.....	1200	50
4757	303/U	.039 SCCS	.116 F-1	A	.170	FEP†	28.5	1900	50
4759	316/U	7/.0067 SCCS	.060 F-1	A	.102	FEP†	.....	1200	50

#C—Copper; K—Karma or equal; SCC—Silver covered copper; SCCS—Silver covered copper steel; SPC—Silver plated copper; SPCB—Silver plated cadmium bronze; SPCW—Silver plated Copperweld.
*F-1—Solid Teflon†.
†A—Silver covered copper, single braid; B—Silver coated copper, double braid; C—Copper, double braid; D—Copper, single braid; E—Karma or equal, single braid; F—Silver coated copper, single braid; G—Silver plated copper, single braid; H—Silver covered copper, double braid.
‡V—High temperature, lacquer-impregnated fiberglass braid with Teflon† between shield and jacket; V1—High temperature, lacquer-impregnated polyester fiber over wrapped or extruded silicone-impregnated fiberglass; 11A—Low temperature, black, non-contaminating PVC; FEP—Fluorinated ethylene propylene copolymer, 200 C Teflon†; TFE—Tetrafluoride ethylene propylene copolymer, 250 C Teflon; KEL-F—
&With armor.

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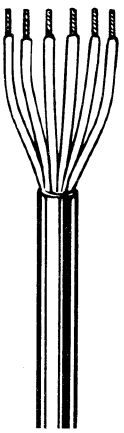
Multiconductor Cables

PVC JACKETED UNSHIELDED CABLES (FIG. A) (UL) CL2

Stranded, tinned copper conductors. Color coded PVC insulation; color codes available on request. Conductors cabled. Gray PVC outer jacket. **Temperature Range:** −20°C. to +80°C.

Cat. No.	No. of Cond.	Gauge and Strands	Insul. Wall In.	Jacket Wall In.	Overall Dia. In.
22 GAUGE—UL STYLE 2464 300V					
5400	2	22 (7×30)	.010	.020	.140
5401	3	22 (7×30)	.010	.020	.150
5406	4	22 (7×30)	.010	.020	.160
5411	5	22 (7×30)	.010	.020	.175
5416	6	22 (7×30)	.010	.020	.200
5421	7	22 (7×30)	.010	.020	.210
5426	8	22 (7×30)	.010	.020	.215
5431	9	22 (7×30)	.010	.020	.225
5432	10	22 (7×30)	.010	.020	.235
5434	12	22 (7×30)	.010	.020	.250
5438	15	22 (7×30)	.010	.020	.268
5440	20	22 (7×30)	.010	.025	.300
5442	25	22 (7×30)	.010	.035	.350
5446	30	22 (7×30)	.010	.035	.375
5448	40	22 (7×30)	.010	.035	.435
5450	50	22 (7×30)	.010	.045	.500
5460	60	22 (7×30)	.010	.045	.530
22 GAUGE—UL LISTED 2464 300V					
5640	2	20 (10×30)	.015	.025	.180
5641	3	20 (10×30)	.015	.025	.190
5642	4	20 (10×30)	.015	.025	.190
5643	5	20 (10×30)	.015	.025	.222
5644	7	20 (10×30)	.015	.025	.240
5645	9	20 (10×30)	.015	.030	.300
5646	12	20 (10×30)	.015	.030	.320
18 GAUGE—UL STYLE 2464, 300 V					
5468	3	18 (16×30)	.018	.030	.240
5470	4	18 (16×30)	.018	.032	.265
5471	5	18 (16×30)	.018	.037	.295
5472	7	18 (16×30)	.018	.037	.324
5473	9	18 (16×30)	.018	.037	.379
5474	12	18 (16×30)	.018	.040	.412
5475	15	18 (16×30)	.018	.045	.465
5476	19	18 (16×30)	.018	.045	.505
5477	25	18 (16×30)	.018	.060	.600
16 GAUGE—UL STYLE, 2463, 600 V					
5466	3	16 (19×29)	.030	.045	.360
5480	4	16 (19×29)	.030	.045	.375
5488	5	16 (19×29)	.030	.045	.405
5481	7	16 (19×29)	.030	.045	.455
5489	9	16 (19×29)	.030	.045	.510
5482	12	16 (19×29)	.030	.060	.600
5483	15	16 (19×29)	.030	.060	.650
5484	19	16 (19×29)	.030	.065	.715
5490	25	16 (19×29)	.030	.065	.820
14 GAUGE—UL STYLE 2463, 600 V					
5464	3	14 (19×27)	.045	.045	.465
5485	4	14 (19×27)	.045	.045	.495
5491	5	14 (19×27)	.045	.060	.560
5486	7	14 (19×27)	.045	.060	.630
5492	9	14 (19×27)	.045	.065	.750
5487	12	14 (19×27)	.045	.065	.770
5493	15	14 (19×27)	.045	.080	.900

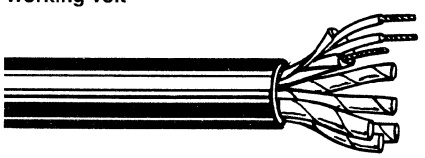


4-PAIR SHIELDED INSTRUMENTATION CABLES (FIG. C)

Stranded, tinned copper conductors. Color-coded polypropylene insulation; color codes available on request. Conductors cabled into pairs, each pair individually shielded with Mylar† polyester reinforced aluminum foil. Tinned copper drain wire. Gray PVC outer jacket. **Temperature Range:** −40°C to +105°C. **Suggested Working Voltage:** 400 V.

Cat. No.	Gauge and Strand	Insul. Wall In.	Jacket Wall In.	Overall Dia. In.	Cap. pF/ft.*
5528	20 (7×28)	.015	.030	.345	27

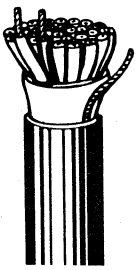
*Capacitance between conductors



OVERALL SHIELDED, MULTI-PAIRED CABLES) (UL) CL2 (FIG. A)

22 AWG, solid, tinned copper conductors. Color-coded PVC insulation; color codes available on request. Conductors twisted into pairs. Overall Mylar† polyester reinforced aluminum foil shield. Stranded, tinned copper drain wire. Gray PVC overall jacket. **Temperature Range:** −20°C to +80°C (UL to +80°C). UL Style 2464. **Voltage Rating:** 300 V. CSA SR-PVC.

Cat. No.	No. of Pairs	Insul. Wall In.	Jacket Wall In.	Overall Wall In.	Cap. pF/ft.*
5912	2	.013	.032	.224	35
5914	4	.013	.032	.265	35
5916	6	.013	.035	.321	35
5919	9	.013	.037	.373	35
5925	15	.013	.040	.437	35
5929	19	.013	.040	.475	35
5937	27	.013	.045	.590	35
5901	38	.008	.045	.600	35
5902	51	.008	.050	.700	35



BRAIDED, TINNNED COPPER SHIELDED COMPUTER & CONTROL CABLE (FIG. B)

Stranded, tinned copper conductors. Color-coded PVC insulation; color codes available on request. Conductors cabled with fillers and wrap. Overall braided, tinned copper sheild. Gray PVC jacket. **Temperature Range:** −20°C to +80°C (UL to +80°C). UL listed. **Voltage Rating:** 300 V.

Cat. No.	No. of Cond.	Gauge and Strands	Insul. Wall In.	Jacket Wall In.	Overall Dia. In.
24 AWG—UL STYLE 2343					
5802	5	24 (7×32)	.010	.060	.266
5803	7	24 (7×32)	.010	.060	.281
5804	12	24 (7×32)	.010	.060	.331
5805	15	24 (7×32)	.010	.060	.356
5806	19	24 (7×32)	.010	.060	.375
5807	27	24 (7×32)	.010	.060	.426
5808	37	24 (7×32)	.010	.060	.464
5809	48	24 (7×32)	.010	.060	.516
5810	60	24 (7×32)	.010	.060	.553
22 AWG—UL STYLE 2343					
5821	5	22 (7×30)	.010	.060	.284
5822	7	22 (7×30)	.010	.060	.296
5833	12	22 (7×30)	.010	.060	.356
5834	15	22 (7×30)	.010	.060	.390
5835	19	22 (7×30)	.010	.060	.406
5836	27	22 (7×30)	.010	.060	.457
5837	37	22 (7×30)	.010	.060	.501
5838	48	22 (7×30)	.010	.060	.564
5839	60	22 (7×30)	.010	.060	.608
20 AWG—UL STYLE 2725					
1722	2	20 (26×34)	.015	.020	.220
1723	3	20 (26×34)	.015	.020	.235
1724	4	20 (26×34)	.015	.020	.240
1725	5	20 (26×34)	.015	.020	.260
1726	6	20 (26×34)	.015	.020	.280
1727	7	20 (26×34)	.015	.020	.290
1728	8	20 (26×34)	.015	.020	.300
1740	10	20 (26×34)	.015	.045	.360
1741	12	20 (26×34)	.015	.045	.385
1742	15	20 (26×34)	.015	.045	.415
1743	20	20 (26×34)	.015	.045	.455
20 AWG—UL STYLE 2343					
5841	19	20 (19×32)	.010	.060	.450
5842	27	20 (19×32)	.010	.060	.575
5843	37	20 (19×32)	.010	.060	.645
5844	48	20 (19×32)	.010	.060	.700

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Hook-Up Wire

80°C PVC INSULATED WIRE (FIG. A)

Solid or stranded tinned copper or stranded "topcoat" conductor (stranded copper conductor passed through a tin bath to bond individual strands (together). Color-coded PVC insulation; .016" nom. thickness. **Temperature Range:** −40°C to +80°C. **Voltage Rating:** 300 V.

Cat. No.	Gauge and Strand	Insul. Wall In.	Nom. O.D. In.
TINNED CONDUCTORS—UL-1007 CSA-TR-64 VW-1			
801	22 (solid)	.016	.065
811	20 (solid)	.016	.071
841	18 (solid)	.016	.080
819	24 (7 X 32)	.016	.059
821	22 (7 X 30)	.016	.069
831	20 (10 X 30)	.016	.078
846	18 (16 X 30)	.016	.085
816	16 (26 X 30)	.016	.095
"TOPCOAT" CONDUCTORS—UL-1007 CSA-TR-64 VW-1			
813	24 (7 X 32)	.016	.059
823	24 (7 X 30)	.016	.069
833	20 (10 X 30)	.016	.078
843	18 (16 X 30)	.016	.085
STRANDED CONDUCTORS—UL-1061 CSA-SR-64-PVC VW1			
896	22 (7 X 30)	.009	.050
897	20 (7 X 28)	.009	.058
898	18 (16 X 30)	.099	.068

105°C PVC INSULATED WIRE (FIG. B)

Stranded or solid tinned copper or stranded "Topcoat" conductor (stranded copper conductor passed through tin bath to bond individual strands together). Color-coded PVC insulation; .032 nom. thickness. **Temperature Range:** −30°C to +105°C. **Voltage Rating:** 600 V.

Cat. No.	Gauge and Strand	Insul. Wall In.	Nom. O.D. In.
TINNED CONDUCTORS—UL-1015 CSA-TEW-105 VW-1			
851	22 (solid)	.032	.097
856	20 (solid)	.032	.104
861	18 (solid)	.032	.112
866	22 (7 X 30)	.032	.102
871	20 (10 X 30)	.032	.110
876	18 (16 X 30)	.032	.119
890	16 (26 X 30)	.032	.127
891	14 (41 X 30)	.032	.141
892	12 (65 X 30)	.032	.160
893	10 (105 X 30)	.032	.194
TINNED CONDUCTORS—UL-1028 CSA-TEW-105 VW-1			
894	8 (133 X 30)	.032	.255
"TOPCOAT" CONDUCTORS—UL-1015 CSA-TEW-105 VW-1			
865	22 (7 X 30)	.032	.102
875	20 (7 X 28)	.032	.110
885	18 (16 X 30)	.032	.119

KYNAR INSULATED WIRE (FIG. A)

Silver-plated solid OFHC copper conductors. Color-coded Kynar insulation. UL Style 1422 and 1426. VW-1 vertical flame test. Rated 105°C.

Cat. No.	Gauge and Strand	Insul. Wall In.	Nom. O.D. In.
901	30 (solid)	.005	.020
902	28 (solid)	.005	.023
903	26 (solid)	.005	.026
904	24 (solid)	.005	.030

IRRADIATED PVC INSULATED WIRE (FIG. A)

Consolidated IRR/PVC is a polyvinylchloride insulation which has been cross-linked by an irradiation process, resulting in an insulation which is far superior to ordinary PVC. Extremely heat and abrasion resistant. Stranded, tinned copper conductors. **Max. Operating Temperature:** 105°C; UL Style 1429, 80°C.

Cat. No.	Gauge and Strand	Type Desig-nation	Insul. Wall In.	Nom. O.D. In.	Rated Volts
MIL-W-16878 TYPE B—UL STYLE 1429					
920	26 (7×34)	B-26	.010	.039	600
921	24 (7×32)	B-24	.010	.044	600
927	24 (19×36)	B-24	.010	.045	600
922	22 (7×30)	B-22	.010	.050	600
928	22 (19×34)	B-22	.010	.051	600
923	20 (7×28)	B-20	.010	.058	600
929	20 (19×32)	B-20	.010	.059	600
924	18 (7×26)	B-18	.010	.068	600
930	18 (19×30)	B-18	.010	.068	600
925	16 (19×29)	B-16	.010	.078	600
MIL-W-16878 TYPE C—UL STYLE 1430					
931	24 (7×32)	C-24	.016	.058	1000
932	22 (7×30)	C-22	.016	.064	1000
933	20 (7×28)	C-20	.016	.072	1000
934	18 (19×30)	C-18	.016	.082	1000
935	16 (19×29)	C-16	.016	.092	1000
926	14 (19×27)	C-14	.016	.105	1000
936	12 (19×25)	C-12	.016	.124	1000

*When ordering, specify catalog number and MIL Type or UL Style. UL Style is identified by surface printing; MIL Type has no marking.

Construction UL 1569 CSA TR-64
- Conductors: solid or stranded tinned copper conductor
- Insulation: Polyvinylchloride (PVC)

Applications
- Internal wiring of electrical and electronic equipment

Characteristics
- Temperature: −10°C +105°C
- Voltage Rating: 300 Volts working 600 Volts peak electronic use only

UL style 1569 VW-1 105°C 300 volts CSA TR-64 600 volts peak

Catalog No.	Gauge & Strands	Nom. Insul. Wall and Type	Nom. O.D.	Color Code
814	**28** (7 x 36) Tin Copper	.016" PVC	.047	0-9
815	**26** (7 x 34) Tin Copper	.016" PVC	.051	0-9
817	**24** (7 x 32) Tin Copper	.016" PVC	.056	0-9
818	**22** (7 x 30) Tin Copper	.016" PVC	.062	0-9
820	**20** (10 x 30) Tin Copper	.016" PVC	.069	0-9
822	**18** (16 x 30) Tin Copper	.016" PVC	.077	0-9
824	**16** (26 x 30) Tin Copper	.016" PVC	.092	0-9
825	**14** (19 x 27) Tin Copper	.016" PVC	.110	0-9
826	**12** (19 x 25) Tin Copper	.018" PVC	.125	0, 2, 9
827	**10** (105 x 30) Tin Copper	.020" PVC	.162	1, 2, 9

SILICONE RUBBER INSULATED WIRE (FIG. E) UL LISTED

Stranded, tinned copper conductor (SF-2); flexible, stranded, tinned copper conductor (SFF-2). Color-coded, extruded silicone rubber insulation. Nom. insulation thickness, .031". Lacquered, white glass yarn braid outer jacket .009" thick. **Temperature Range:** −55°C to +200°C (SF-2); −55°C to +150°C (SFF-2). **Voltage Rating:** 600 V.

Cat. No.	Gauge and Strand	Nom. O.D. In.	Net per 1000	Cat. No.	Gauge and Strand	Nom. O.D. In.
TYPE SF-2				**TYPE SFF-2**		
9900	18 (7×26)	.126	**$266.26**	**9907**	18 (16×30)	.123
9901	16 (7×24)	.135	**329.59**	**9908**	16 (26×30)	.135
9902	14 (7×22)	.153	**382.72**	**9910**	14 (41×30)	.153
9903	12 (19×20)	.176	**515.38**	**9911**	12 (65×30)	.173
9904	10 (19×24)	.234	**821.70**			

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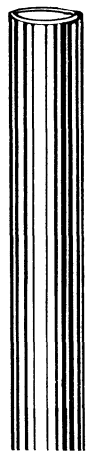
Consolidated electronic wire & cable

Tubing and Sleeving

CIT-221 AND CIT-221V SERIES HEAT SHRINKABLE FLEXIBLE CROSS-LINKED POLYOLEFIN TUBING

Thermally stable Class B (130°C) material. Excellent flame retardant properties. CIT-221 Series meets MIL-I-23053C 5. CLasses and II, UL VW-1. Available in standard colors: Black, white or clear: clear tubing available only in Class II. CIT-221V Series materials meet the requirements of UL Standard 224, issue of February 21, 1979 and CSA Electrical Bulletin No. 985 Ptd. January 9, 1975. Available in black or white. CIT-221V Series are surface printed.

Consolidated Number*	Min. Supplied ID (In.)	Max. Recovered ID (In.)	Nom. Recovered Wall Thickness (In.)	6″ Lengths Std. Pkg.	4″ Lengths Std. Pkg.	Spools Ft. per Spool
CIT-221-3/64	.046	.023	.016	500′	100′	1000
CIT-221-1/16	.063	.031	.017	500	100	1000
CIT-221-3/32	0.92	.046	.020	500	100	500 1000
CIT-221-1/8	.125	.062	.020	500	100	500 1000
CIT-221-3/16	.187	.093	.020	500	100	500
CIT-221-1/4	.250	.125	.025	500	100	250 500
CIT-221-3/8	.375	.187	.025	500	100	200 250
CIT-221-1/2	.500	.250	.025	500	20	150 250
CIT-221-3/4	.750	.375	.030	500	20	100 250
CIT-221-1	1.000	.500	.035	500	20	100 250
CIT-221-1 1/2	1.500	.750	.040	500	20	100 125
CIT-221-2	2.000	1.000	.045	500	20	100 125

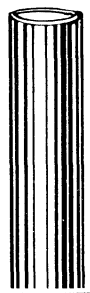


*For surface printed tubing, add the letter **V** following 221 in part number, i.e., CIT-221**V**-3:64; same prices.

CIT-105 SERIES HEAT SHRINKABLE FLEXIBLE PVC TUBING

Outstanding dieletric and mechanical properties. Oil and chemical resistant. Non-irradiated material. **Temperature Range:** −12°C to +105°C. Meets ASTM D 922, Grades C and CFR; MIL-I-631D. Grade C and MIL-I-23053C/MIL-I-23053/2. Class 2. **Longitudinal Change:** −25% maximum. Secant Modulus at 2% strain: 25,000 psi maximum. Heat Shock (4 hrs. at 180°C): no cracking, flowing or dripping. No cracking when bent 360° around a mandrel. **Tensile Strength:** 2,000 psi minimum. Ultimate Elongation: 200% minimum. **Standard colors:** black, white and clear. Special colors and dimensions are available, subject to minimum runs.

CIT Consolidated Number*	Min. Supplied I.D. (In.)	Max. Recovered I.D. (In.)	Nom. Recovered Wall (In.)
105-3/64	.046	.023	.020
105-1/16	.062	.031	.020
105-3/32	.093	.046	.020
105-1/8	.125	.062	.025
105-3/16	.187	.093	.025
105-1/4	.250	.125	.025
105-3/8	.375	.187	.030
105-1/2	.500	.250	.030
105-3/4	.750	.375	.035
105-1	1.000	.500	.040
105-1 1/2	1.500	.750	.045
105-2	2.000	1.000	.050



*Specify color.

CFT-200 SERIES EXTRUDED TFE TEFLON™ TUBING

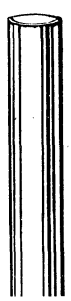
High performance electrical insulation grade. Available in thin wall (CFT-200) or standard wall (CFT-250). Temperature range: −70°C to +260°C. CFT-200 meets AMS 3655, ASTMD3295, UL Listed, 300 Volts, VW-1 rated. CFT-250 meets MIL-I-22129C, AMS-3653, SPIFD103 and ASTMD3295, UL Listed, 600 Volts, VW-1 rated. **Standard color:** natural. Additional colors available subject to minimum runs.

CFT-200 SERIES/EXTRUDED TFE TEFLON™ TUBING

Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (In.)	Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (In.)
CFT-200-30	.012	.009	CFT-200-12	.085	.012
CFT-200-28	.015	.009	CFT-200-11	.095	.012
CFT-200-26	.018	.010	CFT-200-10	.106	.012
CFT-200-24	.022	.010	CFT-200-8	.133	.015
CFT-200-22	.027	.010	CFT-200-7	.148	.015
CFT-200-20	.034	.012	CFT-200-6	.166	.015
CFT-200-19	.038	.012	CFT-200-5	.186	.015
CFT-200-18	.042	.012	CFT-200-4	.208	.015
CFT-200-17	.047	.012	CFT-200-3	.234	.015
CFT-200-16	.053	.012	CFT-200-2	.263	.015
CFT-200-15	.059	.012	CFT-200-1	.294	.015
CFT-200-14	.066	.012	CFT-200-0	.330	.015
CFT-200-13	.076	.012			

CFT-250 SERIES/EXTRUDED TFE TEFLON™ TUBING

Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (In.)	Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (in.)
CFT-250-24	.022	.012	CFT-250-11	.095	.016
CFT-250-22	.027	.012	CFT-250-10	.106	.016
CFT-250-20	.034	.016	CFT-250-8	.133	.020
CFT-250-19	.038	.016	CFT-250-7	.148	.020
CFT-250-18	.042	.016	CFT-250-6	.166	.020
CFT-250-17	.047	.016	CFT-250-5	.186	.020
CFT-250-16	.053	.016	CFT-250-4	.208	.020
CFT-250-15	.059	.016	CFT-250-3	.234	.020
CFT-250-14	.066	.016	CFT-250-2	.263	.020
CFT-250-13	.076	.016	CFT-250-1	.294	.020
CFT-250-12	.085	.016	CFT-250-0	.330	.020



CVC-105 SERIES GENERAL PURPOSE PLASTIC TUBING (105°C)

Tough, flexible vinyl tubing is made with non-migrating plasticizers. Rated for a continuous operating temperature of 105°C. High degree of mechanical strength. Exceptional long-term resistance to deformation from cold flow. **Rated:** 300 volts. Meets MIL-I-631D, Type F, Form U, subforms Ua and Ub, Grade C, Class 1, Category 1, ASTM D922. **Standard colors:** clear and black.

Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (In.)	Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (In.)	Consolidated Number	Nom. I.D. (In.)	Nom. Wall Thickness (In.)
CVC-105-24	.022	.013	CVC-105-8	.133	.020	CVC-105-5/8″	.625	.035
CVC-105-22	.027	.012	CVC-105-7	.148	.020	CVC-105-3/4″	.750	.035
CVC-105-20	.034	.016	CVC-105-6	.166	.020	CVC-105-7/8″	.875	.035
CVC-105-19	.038	.016	CVC-105-5	.186	.020	CVC-105-1″	1.000	.035
CVC-105-18	.042	.016	CVC-105-4	.208	.020	CVC-105-1 1/8″	1.125	.040
CVC-105-17	.047	.016	CVC-105-3	.234	.020	CVC-105-1 1/4″	1.250	.040
CVC-105-16	.053	.016	CVC-105-2	.263	.020	CVC-105-1 3/8″	1.375	.045
CVC-105-15	.059	.016	CVC-105-1	.294	.020	CVC-105-1 1/2″	1.500	.055
CVC-105-14	.066	.016	CVC-105-0	.330	.020	CVC-105-1 3/4″	1.750	.055
CVC-105-13	.076	.016	CVC-105-5/16″	.312	.025	CVC-105-2″	2.000	.060
CVC-105-12	.085	.016	CVC-105-3/8″	.375	.025	CVC-105-2 1/4″	2.250	.065
CVC-105-11	.095	.016	CVC-105-7/16″	.438	.025	CVC-105-2 1/2″	2.500	.070
CVC-105-10	.106	.016	CVC-105-1/2″	.500	.030			
CVC-105-9	.118	.020	CVC-105-9/16″	.562	.030			

#Net per putup of 50′

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Plastic Wire to MIL-W-16878
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WIRE • CABLE TUBING DIVISION

Daflex & Daflon Insulated Tubing In Stock to UL-MIL-Industrial Specifications
Polyvinylchloride-PVC-Polyethylene Plastic Tubing to UL and MIL-I-631D, MIL-I-8057A, MIL-I-21557A
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Plastic Tubing to MIL-I-7444, MIL-I-22076
Fiberglass Sleeving
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MIL-W-76B
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MIL-W-3861
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KYNAR, POLYOLEFIN, PVC, TEFLON*
NEOPRENE* TUBING
2:1, 3:1, 4:1
SHRINK/MELT

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SHRINKABLE

IRRADIATED POLYOLEFIN TUBING BRAIDED COPPER SHIELDING

DABURN

2:1, 4:1 • SHRINK/MELT

This series is designed for maximum mechanical strength at stress or points of connection. It is strong, abrasion resistant and is supplied in expanded sizes. It insulates, jackets, splices, encapsulates, weather-proofs components, connectors, cables and irregular shaped objects. When exposed to heat 250°F the tubing shrinks 50% in diameter, 5% longitudinal contraction. Controlled shrinkage to exact requirement takes place. SH275 meets or exceeds UL STD 224, MIL-I-23053B/5 Class 1 (colors) and 2 (clear), and MIL-R-468464 (MI), TY 5, CL 1. SH290 meets or exceeds MIL-1-23053/6. SH275 is available with UL approval. AMS 3636B (colors), 3637A (clear). Flame retardant (except clear).

SPECIFICATIONS

All Tests Made on Tubing in Recovered Dimension

Continuous Operating Temp: 135°C	Shrinkage Ratio: 2:1 (50%)
Longitudinal Change: 5% Max.	Dielectric Strength: 500 V/MIL Min.
Tensile Strength: 1500 PSI Min.	Dielectric Constant: 2.87 Max.
Ultimate Elongation: 200% Min.	Corrosive Resistance: Non-Corrosive
Special Gravity: 1.29 Max.	Resistance to Soldering Iron: Excellent
Low Temp. Flexibility (−54°C): No Cracking	Fuel, Oil Solvent, Acid, Alkali, Hydraulic Fluid Resistance: Excellent

PACK ASSORTMENTS

DAFLEX Cat. No.	Lengths Per Pack	Tubing Size
SH275-PA1	30	3/64" thru 3/16"
SH275-PA2	16	1/4" thru 3/4"
SH275-PA3	10	1"
SH275-PA4	10	1" thru 4"

COLORS: Black, White, Clear, Red. Each pack contains an assortment of 6" lengths in mixed sizes.

DAFLEX SH275 All Purpose	DAFLEX SH290 Semi-Rigid†	Supplied I.D. Min.	Recovered I.D. Max.	Recovered Wall Nom.*	Standard Package††	DAFLEX Cat. No.	# 6" Lgths. Per Pkg.*†
SH275-3/64	SH290-3/64	.046"	.023"	.016"	100', 1000'	SH275PA-3/64	40
SH275-1/16	SH290-1/16	.063"	.031"	.020"	100', 250', 1000'	SH275PA-1/16	36
SH275-3/32	SH290-3/32	.093"	.046"	0.20"	100', 250', 1000'	SH275PA-3/32	32
SH275-1/8	SH290-1/8	.125"	.062"	.020"	100', 250', 1000'	SH275PA-1/8	28
SH275-3/16	SH290-3/16	.187"	.093"	.020"	100', 250', 1000'	SH275PA-3/16	24
SH275-1/4	SSH290-1/4	.250"	.125"	.025"	100', 250', 500'	SH275PA-1/4"	20
SH275-3/8	SH290-3/8	.375"	.187"	.025"	100', 200'	SH275PA-3/8	16
SH275-1/2	SH290-1/2	.500"	.250"	.025"	100', 200'	SH275PA-1/2	14
SH275-3/4	—	.750"	.375"	.030"	100', *200'*	SH275PA-3/4	12
SH275-1"	—	1.00"	.500"	.035"	100'	SH275PA-1"	8
SH275-1½"	—	1.50"	.750"	.040"	12"*, 24"*, 100"*	SH275PA-1½"	5
SH275-2"	—	2.0"	1.00"	.045"	12"*, 24"*, 100"*	SH275PA-2"	3
SH275-3"	—	3.0"	1.50"	.050"	12"*, 24"*, 100"*	SH275PA-3"	2
SH275-4"	—	4.0"	2.00"	.055"	12"*, 24"*, 50"*	SH275PA-4"	1

STOCK COLORS: Black, White, Red, Clear. Additional colors available. Although processed by hi-energy radiation the Daflex SH275 and SH290 shrinkable tubings do not at any time become radioactive or possess any residual radioactivity.
*Wall thickness will be less if recovery is restricted.
**4' lengths, long length package available.
† **STOCK:** Black 4' lengths. Colors avail.
†† Also stocked: 4', ½", and 1" lengths.
*† **STOCK COLORS:** Black, Clear. Additional Colors to order.
NOTE: Extra flexible, & industrial grade shrinkable polyolefin is available to order.

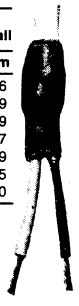
NEW! DAFLEX SHRINK/MELT IRRADIATED POLYOLEFIN TUBING LARGE SHRINK RATIO

Daburn's dual wall polyolefin heat shrinkable tubing is designed to provide a tight moisture proof encapsulating seal. It is suitable as end cap, strain relief, whip cord for ropes and may be used as a selective potting and/or molding compound over wires and cables. When 110°C is applied, the inner wall melts and flows, as the outer wall shrinks; forcing the melting wall to fill voids and interstices and to encapsulate what is covered. The result is a semi-rigid mass. **Daflex SM270 series** is ideal for covering splices, cable junctions and as a shield for coarse surfaces. SM270 is flame retardant. It resists oil, hydraulic fluids, acids and alkalis. It meets or exceeds MIL-I-23053/4, Class 3, AMS3634, is UL APPR. VW-1 for 105°C, 600V.

Ordering Size Nom. I.D. Size	Minimum Expanded I.D.		Maximum Recovered† I.D.		Nominal Recovered Wall	
	Inch	mm	Inch	mm	Inch	mm
SM270-1/8	.125	3.2	.023	.06	.038	0.96
SM270-3/16	.187	4.8	.060	1.5	.043	1.09
SM270-1/4	.250	6.4	.080	2.0	.047	1.19
SM270-3/8	.375	9.5	.120	3.0	.050	1.27
SM270-1/2	.500	12.7	.157	4.0	.055	1.39
SM270-3/4	.750	19.0	.313	8.0	.065	1.65
SM270-1"	1.000	25.4	.400	10.2	.075	1.90

† When full recovery is permitted.

STANDARD COLOR: Black. Clear (not flame retardant) available to order.
STANDARD LENGTH: 100', 1000', in 4' lengths, additional lengths to order.



PROPERTIES

Tensile Strength, Min.: 1500 PSI
Elongation, Min.: 300%
Longitudinal Change, Max.: 10%
Operating Temperature: −55°C to +110°C
Shrinkage Temperature Nom.: 110°C
Fungus Resistance: Inert
Dielectric Strength, Min.: 300 V/MIL
Dielectric Constant, Max.: 3.1

NEW! 4:1 SHRINKABLE POLYOLEFIN TUBING

DAFLEX SH277 shrinkable irradiated polyolefin tubing recovers to 25% of its supplied size when full recovery is permitted. Material will shrink with the application of 120°C (250°F); is rated for continuous operation from −55°C to 135°C and will withstand up to 200°C (392°F) for short durations. 500V/MIL. Minimum dielectric strength.

SH277 is flame retardant and meets or exceeds the specified properties of MIL-1-23053/5 Class 1 and 3. Its longitudinal shrinkage is a maximum of 10%. DAFLEX SH277 can be hot stamped.

Typical applications are where tubing must fit over a large object such as the repair or replacement of cable jacketing, with a connector in place.

DABURN Cat. No.	Expanded I.D. Min.		Recovered* I.D. Max.		Recovered* Wall		Standard Package
	In.	mm	In.	mm	In.	mm	
SH277-1"	1.0	25.4	.250	6.5	.060	1.5	20', 60', 120'†
SH277-2"	2.0	50.8	.500	12.7	.060	1.5	20', 60', 120'†
SH277-3"	3.0	76.2	.750	19.0	.060	1.5	15', 30', 75'†
SH277-4"	4.0	101.6	1.00	25.4	.060	1.5	15', 30', 75'†

*When full recovery is allowed. † Preferred package
STANDARD COLOR: Black
STANDARD PACKAGING: SH277-1" & SH277-2" — 4 ft. lengths
SH277-3" & SH277-4" — 3 ft. lengths.

WE ALSO STOCK 3:1 POLYOLEFIN; TFE; FEP; DUAL WALL POLYOLEFIN; TEFLON & KYNAR SHRINK TUBING

TUBULAR BRAID PER MIL SPEC QQ-B-575

Tinned copper shielded braid mf'd completely round per Mil Spec QQ-B-575. Maintains its round configuration. Shielding coverage is 95% or more. Used in military applications where maximum shielding is required against electrostatic interference. Useful against mechanical abrasion and stresses for cables — as grounding cable.

DABURN No.	Nom. Inside Diam. When Rounded	Construction Total No. of Wires	Carriers	AWG of Indiv. Wires	Approx. AWG Equiv.	Nom. Circular Mils	*Current Carrying Cap.
2350-1/32	1/32"	24	24	#36	#22	640	7.0 amps
2350-1/16	1/16".	48	24	#36	#19	1290	11.0 amps
2350-5/64	5/64"	72	24	#36	#17	1900	18.0 amps
2350-7/64	7/64"	96	24	#36	#16	2500	22.0 amps
2350-1/8	1/8"	120	24	#36	#15	3260	28.0 amps
2350-5/32	5/32"	240	24	#36	#12	6200	39.0 amps
2350-11/64	11/64"	168	24	#36	#14	4500	32.0 amps
2350-3/16	3/16"	192	24	#36	#13	5100	35.0 amps
2350-13/64	13/64"	312	24	#36	#11	8200	46.0 amps
2350-1/4	1/4"	384	24	#36	#10	10,400	53.0 amps
2350-9/32	9/32"	120	24	#30	# 9	12,060	60.0 amps
2350-3/8	3/8"	384	48	#36	#10	10,400	53.0 amps
2350-7/16	7/16"	240	24	#30	# 6	24,120	90.0 amps

DABURN No.	Nom. Inside Diam. When Rounded	Construction Total No. of Wires	Carriers	AWG of Indiv. Wires	Approx. AWG Equiv.	Nom. Circular Mils	*Current Carrying Cap.
2350-1/2	1/2"	528	48	#36	# 9	13,200	70.0 amps
2350-9/16†	9/16"	528	48	#36	# 9	13,200	70.0 amps
2351-9/16	9/16"	480	48	#30	# 3	48,240	145.0 amps
2350-21/32	21/32"	768	48	#30	# 1	77,180	190.0 amps
2350-11/16†	11/16"	720	48	#36	# 7	19,000	82.0 amps
2350-25/32	25/32"	864	48	#36	# 7	21,750	85.0 amps
2350-13/16	13/16"	864	48	#36	# 7	21,750	85.0 amps
2350-7/8	7/8"	336	48	#30	# 5	33,700	100.0 amps
2350-1"	1"	384	48	#30	# 4	38,600	120.0 amps
2350-1⅛"	1⅛"	432	48	#30	# 4	43,330	130.0 amps
2350-1¼"†	1¼"	480	48	#30	# 3	48,150	145.0 amps
2350-1⅜"	1⅜"	528	48	#30	# 3	53,000	150.0 amps
2350-1½"	1½"	576	48	#30	# 2	57,775	165.0 amps

STANDARD SPOOL PUT-UP: 50 Ft., 100 Ft., 250 Ft. Larger Spools Available — Advise.
* Values based on copper in free air at 65°F and intended as a guide only.
† These sizes are mfg. to standards of QQ-B-575 although they are not listed in the specification.

Additional constructions and variations made to order. Also available in silver plated copper, bare copper, and nickel plated copper, as well as flat braided tinned copper.

WRITE FOR COMPLETE CATALOG

DABURN ELECTRONICS & CABLE CORP. • 225 PEGASUS AVE. • NORTHVALE, N.J. • 201-768-5400 • FAX 201-768-9642

DABURN MIL-W-16878 INSTRUMENTATION SHIELDED • TEFLON HI-TEMP WIRE • VW1

DESCRIPTION: One or more conductors, each conductor silver plated concentrically stranded copper wire. Type E, MIL-W-16878E/4 extruded TFE .010" insulation. When shielded, braided silver plated copper shield over conductor(s), 90% shield coverage. When covered, either a TEFLON* impregnated fiberglass braid or a .010" TEFLON* fused, double tape jacket overall. Fungus, solvent, moisture, flame, acid, alkali and oil resistant. Multiconductors are twisted.
VOLTAGE RATING: 600V, VW-1.
TEMPERATURE RATING: -65°C to +200°C. For 250°C USE N.P. CONDUCTOR.

TEFLON* IMPREGNATED BRAID OVER SHIELD

DABURN No.	Conds.	AWG Size	Strand	Nom. O.D.
2444	1	26	7/34	.075"
2444/2	2	26	7/34	.119"
2445	1	24	19/36	.081"
2445/2	2	24	19/36	.126"
2445/3	3	24	19/36	.133"
2445/4	4	24	19/36	.144"
2445/5	5	24	19/36	.156"
2446	1	22	19/34	.088"
2446/2	2	22	19/34	.137"
2446/3	3	22	19/34	.144"
2446/4	4	22	19/34	.158"
2446/5	5	22	19/34	.172"

DABURN No.	Conds.	AWG Size	Strand	Nom. O.D.
2447	1	20	19/32	.093"
2447/2	2	20	19/32	.154"
2447/3	3	20	19/32	.163"
2447/4	4	20	19/32	.180"
2447/5	5	20	19/32	.195"
2448	1	18	19/30	.097"
2448/2	2	18	19/30	.162"
2448/3	3	18	19/30	.172"
2448/4	4	18	19/30	.192"
2448/5	5	18	19/30	.207"
2449	1	16	19/29	.117"
2449/2	2	16	19/29	.196"

TEFLON* TAPE WRAP JACKET OVER SHIELD

DABURN No.	Conds.	AWG Size	Strand	Nom. O.D.
2454	1	26	7/34	.078"
2454/2	2	26	7/34	.125"
2455	1	24	19/36	.084"
2455/2	2	24	19/36	.128"
2455/3	3	24	19/36	.135"
2455/4	4	24	19/36	.148"
2455/5	5	24	19/36	.162"
2456	1	22	19/34	.090"
2456/2	2	22	19/34	.140"
2456/3	3	22	19/34	.148"
2456/4	4	22	19/34	.162"
2456/5	5	22	19/34	.183"

DABURN No.	Conds.	AWG Size	Strand	Nom. O.D.
2457	1	20	19/32	.099"
2457/2	2	20	19/32	.158"
2457/3	3	20	19/32	.167"
2457/4	4	20	19/32	.184"
2457/5	5	20	19/32	.204"
2458	1	18	19/30	.109"
2458/2	2	18	19/30	.178"
2458/3	3	18	19/30	.189"
2458/4	4	18	19/30	.208"
2458/5	5	18	19/30	.230"
2459	1	16	19/29	.130"
2459/2	2	16	19/29	.230"

STANDARD SPOOL PUT-UPS: 250 Ft., 500 Ft., 1000 Ft. **CONDUCTOR COLOR CODE:** 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow.
We also stock—Shield braid over conductors; Teflon* impregnated braid over conductors—no shield. Additional constructions to order.

FEP TEFLON* CABLE

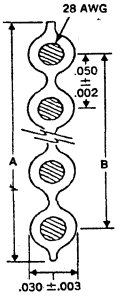
FEP EXTRUDED JACKET OVER SHIELD TYPE E CONDUCTORS

DESCRIPTION: Each conductor silver plated stranded copper wire, Type E extruded TFE .010" insulation. Color coded, cabled, braided silver plated copper shield—90% coverage, FEP white teflon jacket overall.
TEMPERATURE RATING: -65°C to +200°C.
VOLTAGE RATING: 600V. VW-1
CONDUCTOR COLOR CODE: 1—White, 2—Black, 3—Red, 4—Green
STANDARD PUT-UP: 500 Ft., 1000 Ft.
Additional FEP constructions available to order.
*DUPONT

DABURN No.	Conds.	AWG Size	Strand	Nom. O.D.
2480	1	24	19/36	.085"
2480/2	2	24	19/36	.130"
2480/3	3	24	19/36	.135"
2480/4	4	24	19/36	.148"
2481	1	22	19/34	.091"
2481/2	2	22	19/34	.150"
2481/3	3	22	19/34	.158"
2481/4	4	22	19/34	.172"
2482	1	20	19/32	.100"
2482/2	2	20	19/32	.168"
2482/3	3	20	19/32	.178"
2482/4	4	20	19/32	.193"
2483	1	18	19/30	.110"
2483/2	2	18	19/30	.188"
2483/3	3	18	19/30	.207"
2483/4	4	18	19/30	.222"
2484	1	16	19/29	.123"
2484/2	2	16	19/29	.220"

TEFLON HIGH TEMPERATURE FLAT RIBBON CABLE

UL STYLE 20424 • 200°C • 300 VOLTS • VW-1



NOM. WALL: .008"
THICKNESS: .030 ± .003"
TEMPERATURE RATING: -65°C to +200°C
DIELECTRIC CONSTANT: 1.54
CONDUCTOR RESISTANCE: 63 Ohms/M
CAPACITANCE NOM.: 10.9 PF/FT/(G.S.G.)
IMPEDANCE: 120 Ohms nom. (G.S.G.)

Each conductor is 28 AWG, 7 strand of 36 AWG silver plated copper with flexible FEP insulation overall. Conductors are spaced on .050" ± .002" centers, allowing for mass termination with conventional insulation displacement connectors.

DABURN Cat. No.	No. Cond.	(.050 Pitch) Nom. Span B	(.050 Pitch) Nom. Width A
2488/9	9	.400 ± .008	.450 ± .010
2488/10	10	.450 ± .008	.500 ± .010
2488/14	14	.650 ± .008	.700 ± .010
2488/15	15	.700 ± .010	.750 ± .010
2488/16	16	.750 ± .010	.800 ± .015

STANDARD PUT-UP: 100' (30.48M); larger packages available to order.
STANDARD COLOR: Natural
ADDITIONAL CONSTRUCTIONS AVAILABLE: Shielded, shielded and jacketed; PFA (for higher temperature), Tefzel; .100" center spacing; 19 strand (for high flexing—above 50,000,000 flexures). **ADDITIONAL STANDARD CONSTRUCTION THRU 64 COND.**

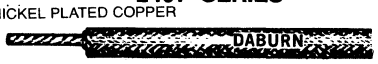
DABURN HIGH TEMPERATURE LEAD WIRE

Small Diameters and High Temperature performance make an outstanding combination for these unique constructions. Basic wire conforms to MIL-W-3861 spec; when shielded, conforms to MIL-N-46026A, 600V RMS. NOTE: These constructions are for dry locations.

800°F TEMPERATURE RATING

2497 SERIES

NICKEL PLATED COPPER



INORGANIC BRAIDED INSULATION

One conductor high temperature aircraft and missile lead wire for operation between 500°F and 800°F. 27% Nickel plated copper conductors with glass braided fiber insulation impregnated with silicone varnish. Multiconductor and shielded construction will be manufactured to customer's specifications.

DABURN Cat. No.	Size	Strand	CMA	Nom. O.D.
2497/18	18	19/.010"	1900	.085"
2497/20	20	19/.008"	1216	.075"
2497/22	22	19/.0063"	755	.070"

STANDARD PUT-UP: 500 Ft., 1000 Ft.

1500°F TEMPERATURE RATING

2498 SERIES

One conductor high temperature radiation resistant aircraft and missile lead wire for operation between 800°F and 1500°F. 27% Nickel plated copper conductors with inorganic, braided insulation. Useful up to 1500°F providing moisture resistance is not required. Multiconductor and shielded construction can be made to customer's specs.

DABURN Cat. No.	Size	Strand	CMA	Nom. O.D.
2498/18	18	19/.010"	1900	.085"
2498/20	20	19/.008"	1216	.075"
2498/22	22	19/.0063"	755	.070"

STANDARD PUT-UP: 500 Ft., 1000 Ft.

INORGANIC BRAIDED INSULATION
NICKEL PLATED COPPER

2000°F TEMPERATURE RATING

NICKEL PLATED COPPER / braided shielding.

vitreous silica
braided insulation

One conductor high temperature radiation resistant aircraft and missile lead wire for operation between 1500°F and 2000°F. 27% Nickel plated copper conductors with vitreous silica braided insulation and a braided shielding. Useful up to 2000°F providing no initial moisture resistance or abrasion resistance is required. Multiconductor construction can be made to customer's specifications.

DABURN Cat. No.	Size	Strand	CMA	Nom. Insulation Thickness	Braid Ni. Shield	Nom. O.D.
2499/18	18	19/.010"	1900	.025"	16-5-36	.122"
2499/20	20	19/.008"	1216	.025"	24-3-36	.112"
2499/22	22	19/.0063"	755	.027"	24-3-36	.108"

STANDARD PUT-UP: 500 Ft., 1000 Ft.

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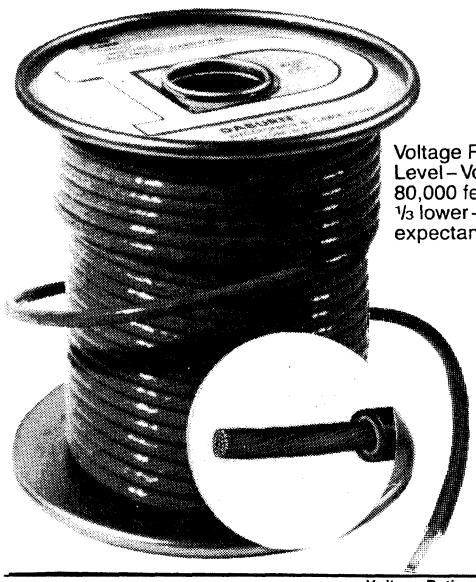
DABURN HI-VOLTAGE CABLE



Voltage Rating at Sea Level – Voltage Rating at 80,000 feet, approximately 1/3 lower – Minimum life expectancy: 10,000 hours

HI-VOLT CORONA RESISTANT TEFLON* CABLE®

SMALL SIZE: You do not need bulky, thick, insulation jacketing as used with silicone rubber and polyethylene insulations to get your hi-voltage requirements. Wire used is MIL-SPEC QQ-W-343 and MIL-W-16878. Insulation used conforms to and surpasses MIL-SPEC-W-16878.

AVOID CORONA PROBLEMS: Corona Resistant Teflon construction is specifically designed to retard and prevent corona penetration.

Temperature variations from – 60°C to + 250°C have no life effect on the corona resistant Teflon. In addition, there is no stress or crack failure under severe, adverse conditions including mechanical strain, moisture, corona or chemical conditions.

DESCRIPTION: Single Conductor, Stranded Silver Plated Copper, Corona Resistant Teflon* Insulation.

TEMPERATURE RATING: – 90°C to + 250°C.

VOLTAGE RATING: Based on insulation thickness.

AVAILABLE COLORS: White, Black, Red, Green, Yellow, Lt. Blue, Brown, Orange, Gray, Violet. (Also available in tracer colors)

PUT-UP: 250′, 500′, 1000′.

ADDITIONAL SIZES AND VOLTAGES AVAILABLE

WRITE FOR COMPLETE CATALOG

DABURN No.	AWG Size	Strand	Voltage Rating AC	Voltage Rating DC	Nom. O.D.
CRT10-2	10	37/26	2500	10,000	.158"
CRT10-2.5	10	37/26	3750	12,500	.168"
CRT12-2	12	19/25	2500	10,000	.142"
CRT12-2.5	12	19/25	3750	12,500	.152"
CRT12-3	12	19/25	4500	15,000	.162"
CRT12-3.5	12	19/25	5300	17,500	.172"
CRT12-4	12	19/25	6000	20,000	.182"
CRT12-5	12	19/25	7500	25,000	.202"
CRT12-6.5	12	19/25	10,000	32,500	.232"
CRT12-8	12	19/25	12,000	40,000	.262"
CRT12-10	12	19/25	15,000	50,000	.302"
CRT14-2	14	19/27	2500	10,000	.124"
CRT14-2.5	14	19/27	3750	12,500	.134"
CRT14-3	14	19/27	4500	15,000	.144"
CRT14-3.5	14	19/27	5300	17,500	.154"
CRT14-4	14	19/27	6000	20,000	.164"
CRT14-5	14	19/27	7500	25,000	.184"
CRT14-6.5	14	19/27	10,000	32,500	.214"
CRT14-8	14	19/27	12,000	40,000	.244"
CRT14-10	14	19/27	15,000	50,000	.284"
CRT16-2	16	19/29	2500	10,000	.111"
CRT16-2.5	16	19/29	3750	12,500	.119"
CRT16-3	16	19/29	4500	15,000	.129"
CRT16-3.5	16	19/29	5300	17,500	.141"
CRT16-4	16	19/29	6000	20,000	.151"
CRT16-5	16	19/29	7500	25,000	.172"
CRT16-6.5	16	19/29	10,000	32,500	.201"
CRT16-8	16	19/29	12,000	40,000	.231"
CRT16-10	16	19/29	15,000	50,000	.271"
CRT18-2	18	19/30	2500	10,000	.105"
CRT18-2.5	18	19/30	3750	12,500	.114"
CRT18-3	18	19/30	4500	15,000	.124"
CRT18-3.5	18	19/30	5300	17,500	.135"
CRT18-4	18	19/30	6000	20,000	.145"
CRT18-5	18	19/30	7500	25,000	.166"
CRT18-6.5	18	19/30	10,000	32,500	.194"
CRT18-8	18	19/30	12,000	40,000	.225"
CRT18-10	18	19/30	15,000	50,000	.265"

DABURN No.	AWG Size	Strand	Voltage Rating AC	Voltage Rating DC	Nom. O.D.
CRT20-2	20	19/32	2500	10,000	.095"
CRT20-2.5	20	19/32	3750	12,500	.105"
CRT20-3	20	19/32	4500	15,000	.115"
CRT20-3.5	20	19/32	5300	17,500	.126"
CRT20-4	20	19/32	6000	20,000	.135"
CRT20-5	20	19/32	7500	25,000	.156"
CRT20-6.5	20	19/32	10,000	32,500	.185"
CRT20-8	20	19/32	12,000	40,000	.215"
CRT20-10	20	19/32	15,000	50,000	.255"
CRT22-2	22	19/34	2500	10,000	.087"
CRT22-2.5	22	19/34	3750	12,500	.097"
CRT22-3	22	19/34	4500	15,000	.107"
CRT22-3.5	22	19/34	5300	17,500	.118"
CRT22-4	22	19/34	6000	20,000	.127"
CRT22-5	22	19/34	7500	25,000	.148"
CRT22-6.5	22	19/34	10,000	32,500	.177"
CRT22-8	22	19/34	12,000	40,000	.207"
CRT22-10	22	19/34	15,000	50,000	.247"
CRT24-2	24	19/36	2500	10,000	.081"
CRT24-2.5	24	19/36	3750	12,500	.091"
CRT24-3	24	19/36	4500	15,000	.101"
CRT24-3.5	24	19/36	5300	17,500	.112"
CRT24-4	24	19/36	6000	20,000	.121"
CRT24-5	24	19/36	7500	25,000	.142"
CRT24-6.5	24	19/36	10,000	32,500	.171"
CRT24-8	24	19/36	12,000	40,000	.201"
CRT24-10	24	19/36	15,000	50,000	.241"
CRT26-2	26	7/34	2500	10,000	.071"
CRT26-2.5	26	7/34	3750	12,500	.081"
CRT26-3	26	7/34	4500	15,000	.091"
CRT26-3.5	26	7/34	5300	17,500	.101"
CRT26-4	26	7/34	6000	20,000	.111"
CRT26-5	26	7/34	7500	25,000	.131"
CRT26-6.5	26	7/34	10,000	32,500	.161"
CRT26-8	26	7/34	12,000	40,000	.191"
CRT26-10	26	7/34	15,000	50,000	.231"

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HI-VOLTAGE SILICONE RUBBER LEAD WIRE 200°C VW-1

One conductor stranded tinned copper, extruded flexible silicone rubber insulation overall. Constructions to UL-3239 (150°C) and nickel plated conductor available.
STANDARD COLOR: White (Natural.) Additional colors to order.

DABURN Cat. No.	Size AWG	Strand	Nom. Ins. Wall	D.C. Volt Rating	Nom. O.D.
2636/22A	22	7/30	.045"	20KV	.120"
2636/22B	22	7/30	.062"	25KV	.155"
2636/22C	22	7/30	.075"	30KV	.180"
2636/22D	22	7/30	.097"	40KV	.225"
2636/20A	20	10/30	.045"	20KV	.126"
2636/20B	20	10/30	.062"	25KV	.160"
2636/20C	20	10/30	.075"	30KV	.186"
2636/20D	20	10/30	.097"	40KV	.232"
2636/18A	18	16/30	.045"	20KV	.136"
2636/18B	18	16/30	.062"	25KV	.170"
2636/18C	18	16/30	.075"	30KV	.196"
2636/18D	18	16/30	.097"	40KV	.245"
2636/16A	16	26/30	.045"	20KV	.150"
2636/16B	16	26/30	.062"	25KV	.185"
2636/16C	16	26/30	.075"	30KV	.210"
2636/16D	16	26/30	.097"	40KV	.256"
2636/14A	14	41/30	.045"	20KV	.167"
2636/14B	14	41/30	.062"	25KV	.200"
2636/14C	14	41/30	.075"	30KV	.227"
2636/14D	14	41/30	.097"	40KV	.275"
2636/12A	12	65/30	.045"	20KV	.181"
2636/12B	12	65/30	.062"	25KV	.215"
2636/12C	12	65/30	.075"	30KV	.241"
2636/12D	12	65/30	.097"	40KV	.290"
2636/10A	10	105/30	.045"	20KV	.220"
2636/10B	10	105/30	.062"	25KV	.255"
2636/10C	10	105/30	.075"	30KV	.280"
2636/10D	10	105/30	.097"	40KV	.325"

STANDARD PUT-UP: 100 Ft., 1000 Ft.

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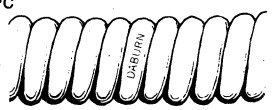
RETRACTILE CORDS • POWER • COMMUNICATION • DABURN

CSA POWER CORDS

Retracted Lengths: 1, 2, 3 & 4 Ft. Extended Lengths: 5, 10, 15 & 20 Ft.
UL Listed — Neoprene Jacketed Cord • OPERATING TEMPERATURE: –20°C to +60°C

DABURN No. & Retracted Lengths				No.			UL‡ & CSA		Volt	Coil Nom. O.D.		Cord Nom.	
4 Ft.*	3 Ft.	2 Ft.	1 Ft.	Cond.	Size	Strand	Type	Amps	Rating	In.	mm	in.	mm
986-4	986-3	986-2	986-1	2	18	41/34	SVO	7	300	7/8	22	.260	7
986/3-4	986/3-3	986/3-2	986/3-1	3	18	41/34	SVO	7	300	1	25	.275	7
989-4	989-3	989-2	989-1	2	18	41/34	SJO	7	300	1 3/16	30	.320	8
989/3-4	989/3-3	989/3-2	989/3-1	3	18	41/34	SJO	7	300	1 3/8	35	.330	9
989/4-4	989/4-3	989/4-2	989/4-1	4	18	41/34	SJO	5.6	300	1 7/16	37	.360	10
989/5-4	—	989/5-2	—	5	18	41/34	SJO	5.6	300	1 3/4	41	.440	11
989/7-4	—	989/7-2	—	7	18	41/34	SJO	4.9	300	1 7/8	48	.522	13
989/15-4†	—	—	—	15	18	41/34	SVO	7	300	2 1/8	54	.575	15
990/3-4	—	990/3-2	—	3	18	41/34	SO	7	600	1 9/16	40	.405	10
990/4-4	—	990/4-2	—	4	18	41/34	SO	5.6	600	1 5/8	41	.435	11
991-4	991-3	991-2	991-1	2	16	65/34	SJO	10	300	1 3/8	35	.330	9
991/3-4	991/3-3	991/3-2	991/3-1	3	16	65/34	SJO	10	300	1 7/16	37	.365	10
991/4-4	991/4-3	991/4-2	—	4	16	65/34	SJO	8	300	1 5/8	38	.395	11
991/5-4	—	991/5-2	—	5	16	65/34	SO	5.6	600	2	54	.540	14
991/6-4	—	991/6-2	—	6	16	65/34	SO	8	600	2 1/8	51	.550	14
					6/16	#16-64/34	—	#16-8					
991/7-4	—	991/7-2	—	7	1/14	#14-41/30	SO	#14-12	600	2 1/4	57	.600	15
992/3-4	—	992/3-2	—	3	16	65/34	SO	10	600	1 13/16	46	.470	12
992/4-4	—	992/4-2	—	4	16	65/34	SO	8	600	1 7/8	48	.500	13
993-4	993-3	993-2	—	2	14	41/30	SO	15	600	2	54	.535	14
993/3-4	993/3-3	993/3-2	—	3	14	41/30	SO	15	600	2 1/8	54	.560	14
993/4-4	993/4-3	993/4-2	—	4	14	41/30	SO	12	600	2 1/4	57	.605	15
994/3-4	994/3-3	994/3-2	—	3	12	65/30	SO	20	600	2 3/8	60	.635	16
994/4-4	994/4-3	994/4-2	—	4	12	65/30	SO	16	600	2 1/2	60	.665	17
					2/12	#12-65/30	—	#12-17					
994/6-4	—	—	—	6	4/18	#18-41/34	—	#18-16	600	2 1/4	57	.605	15
994/7-4	—	994/7-2	—	7	12	65/30	SO	16	600	2 5/8	67	.775	20
996/4-4	—	—	—	4	10	104/30	SO	20	600	2 3/4	70	.745	19



Long Lasting Service — useful wherever cords must change length or position. Extend to approximately five times its retracted length. Returns to its original shape or length when released. Eliminates tangling, twisting or knots. Cords are UL and CSA approved.

Wherever UL Type is shown, approved by CSA testing laboratories.

*Preferred Put-up. 6" tangents on all but 1 Ft. cords — 12" tangents.

Also available: 18/2, 18/3 SVT; 18/2, 18/3, 18/4 SJT; 18/2, 18/3 ST; 16/2, 16/3, 16/4 SJT; 16/2, 16/3, 16/4 SJT in 4 Ft., 3 Ft. and 1 Ft. Retracted, UL Listed.

CONDUCTOR COLOR CODE:
1—Black, 2—White, 3—Green, 4—Red, 5—Orange, 6—Blue, 7—Yellow.

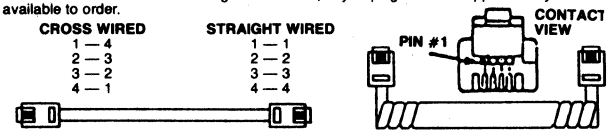
† 989/15-5 Extended to 25 Ft.

WRITE FOR COMPLETE CATALOG

MODULAR PLUG CABLES STRAIGHT AND RETRACTABLE CABLES

Each Daburn modular cord is 28 AWG 7/36 soft tinned copper, color coded with an overall PVC jacket and modular plugs at each end. Shielded constructions use an overall aluminum/polyester shield and drain wire.
Daburn modular cords are suitable for data equipment, interface, keyboards, audio, telephone handsets, security and alarm applications.
They resist oils, grease, acids, fumes and are abrasion resistant. They will not mar surfaces with which they come in contact.
Note: "Half-Modular" cords — lugs on one end, keyed plugs and UL approved styles are available to order.

CROSS WIRED	STRAIGHT WIRED
1 — 4	1 — 1
2 — 3	2 — 2
3 — 2	3 — 3
4 — 1	4 — 4



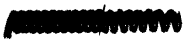
MODULAR PLUG CORDS

STRAIGHT CORDS					RETRACTILE CORDS				
DABURN Cat. No. Straight Wired	Cross Wired	No. of Cond.	Lgth. in Ft.	Con-struc-tion	DABURN Cat. No. Straight Wired	Cross Wired	No. of Cond.	Lgth. Ex-tend.	Con-struc-tion
28-04-7	28-04-7X	4	7	F	28-14-1	28-14-1X	4	5 Ft.	F
28-04-14	28-04-14X	4	14	F	28-14-2	28-14-2X	4	10 Ft.	F
28-04-25	28-04-25X	4	25	F	28-14-5	28-14-5X	4	20 Ft.	F
28-06-7	28-06-7X	6	7	F	28-16-1	28-16-1X	6	5 Ft.	F
28-06-14	28-06-14X	6	14	F	28-16-2	28-16-2X	6	10 Ft.	F
28-06-25	28-06-25X	6	25	F	28-16-5	28-16-5X	6	20 Ft.	F
28-08-7	28-08-7X	8	7	F	28-18-1	28-18-1X	8	3 Ft.	F
28-08-14	28-08-14X	8	14	F	28-18-2	28-18-2X	8	6 Ft.	F
28-08-25	28-08-25X	8	25	F	28-18-5	28-18-5X	8	12 Ft.	F
SHIELDED					SHIELDED				
28-08-7S	28-08-7SX	8**	7	R	28-18-1S	28-18-1SX	8**	5 Ft.	R
28-08-14S	28-08-14SX	8**	14	R	28-18-2S	28-18-2SX	8**	10 Ft.	R
28-08-25S	28-08-25SX	8**	25	R	28-18-5S	28-18-5SX	8**	20 Ft.	R

STOCK JACKET COLORS: Silver Satin, Black. If not specified Silver Satin will be supplied.
STANDARD PACKAGE: 25 pcs. F = Flat construction.
Additional lengths to order. R = Round construction.
**7 conductors + 1 conductor ground. Above also available in #26 AWG, i.e., 26-04-7.
Modular plugs, with and without tabs; modular crimping tool for the above cable available.

OVERALL SHIELDED PLASTIC RETRACTILE CORDS

Retracted Lengths 1, 2, 3, 4 Ft.
Extended Lengths 5, 10, 15, 20 Ft.



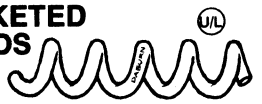
Shielded communication cords 23 AWG 21/36 soft tinned copper with min. 85% spiral T.C. shield coverage. Black "Danyon" plastic jacket overall. Six inch tangents on 2, 3, & 4 ft. cords. Twelve inch tangents on 1 ft. cords. Operating voltage 300V (120V U/L) max. Current carrying capacity 1.0 amp. Std. pkg. 10 pcs. UL Listed as AWM.

DABURN Cat. Nos. Retracted Length				No.	Cord		Coil	
					in.	mm	in.	mm
4 Ft.†	3 Ft.	2 Ft.	1 Ft.	Cond.	Nom.	O.D.	Nom.	O.D.
995D-4	995D-3	995D-2	995D-1	1	.175	4.4	5/8	16
995D/2-4	995D/2-3	995D/2-2	995D/2-1	2	.220	5.6	5/8	16
995D/3-4	995D/3-3	995D/3-2	995D/3-1	3	.230	5.9	3/4	19
995D/4-4	995D/4-3	995D/4-2	995D/4-1	4	.260	7.0	7/8	22
995D/5-4	995D/5-3	995D/5-2	995D/5-1	5	.285	7.2	1	25
995D/6-4	995D/6-3	995D/6-2	995D/6-1	6	.310	7.9	1 1/8	29

TPE jacketed (not U/L) constructions available.

DANYON PLASTIC JACKETED COMMUNICATION CORDS

Retracted Lengths 2, 3 & 4 Ft. —
Extended Lengths 10, 15 & 20 Ft.



Multi-conductors stranded extra flexible #23 AWG 21/36 tinned soft copper for long flex life. "Danyon" plastic jacketed. 120 volt working, current carrying capacity 1 amp. Nom. cond. resist. .022 ohms per linear foot, .185 ohms per retracted foot. For communication equipment such as ham operations, telephone car carriers, radio equipment, head sets, etc.
OPERATING TEMP.: –20°C to +60°C.
MAXIMUM VOLTAGE: 300V.

DABURN No. - Retracted Lengths			No.			Nom Coil O.D.		Nom. Cord O.D.	
4 Ft.†	3 Ft.	2 Ft.	Cond.	Size	Strand	in.	mm	in.	mm
975D-4	975D-3	975D-2	2	23	21/36	5/8	16	.210	5.6
976D-4	976D-3	976D-2	3	23	21/36	3/4	19	.210	5.8
977D-4	977D-3	977D-2	4	23	21/36	7/8	22	.255	6.5
978D-4	978D-3	978D-2	5	23	21/36	1	25	.265	6.7
978D/6-4	978D/6-3	978D/6-2	6	23	21/36	1 1/8	29	.305	7.7
978D/7-4	978D/7-3	978D/7-2	7	23	21/36	1 3/16	30	.325	8.3
978D/8-4	978D/8-3	978D/8-2	8	23	21/36	1 1/4	32	.360	9.1
978D/10-4	978D/10-3	978D/10-2	10	23	21/36	1 3/8	35	.380	9.7
978D/12-4	978D/12-3	978D/12-2	12	23	21/36	1 1/2	38	.390	9.9
978D/15-4	978D/15-3	978D/15-2	15	23	21/36	1 5/8	41	.400	10.2

Conductor Color Code: 1-Black, 2-White, 3-Red, 4-Green, 5-Orange, 6-Blue, 7-Yellow, 8-Brown, 9-White/Black, 10-White/Red, 11-White/Green, 12-White/Orange, 13-White/Yellow, 14-White/Brown, 15-White/Blue.
†Preferred Put-up
Standard Package: 5

DABURN MINI — RETRACTILE COMMUNICATION CORDS - SHIELDED - UNSHIELDED 300V .5 AMP

STYLE 2723 AWM

1, 2 Foot Retracted – 5, 10 Foot Extended

Miniature. Suitable for compact equipment. Cords are #28 AWG. 19/40 soft tinned copper, color coded, where shielded, aluminum polyester foil shield, overall black plastic jacket. 1 Ft. retracted — 12" tangents; 2 Ft. retracted — 6" tangents.
OPERATING TEMPERATURE: –20°C to +60°C.
COLOR CODE: 1—Black, 2—White, 3—Red, 4—Green, 5—Orange, 6—Blue, 7—Yellow, 8—Brown.
STANDARD PACKAGE: 10.
*Not UL construction.
The above cords are also available in 3 Ft. and 4 Ft. retracted, which extend to 15 and 20 feet respectively.

UNSHIELDED							SHIELDED*						
DABURN Cat. No.			Coil		Cord		DABURN Cat. No.			Coil		Cord	
1 Ft.	2 Ft.	Cond.	in.	mm	in.	mm	1 Ft.	2 Ft.	Cond.	in.	mm	in.	mm
975/28A	975/28	2	.5	13	.14	3.4	975/28SA	975/28S	2	.5	13	.16	4.0
976/28A	976/28	3	.5	13	.14	3.5	976/28SA	976/28S	3	.5	13	.17	4.3
977/28A	977/28	4	.5	13	.15	3.8	977/28SA	977/28S	4	.6	15	.18	4.6
978/28A	978/28	5	.6	14	.18	4.0	978/28SA	978/28S	5	.6	15	.19	4.8
979/28A	979/28	6	.6	14	.19	4.3	979/28SA	979/28S	6	.6	16	.20	5.0
980/28A	980/28	7	.6	16	.20	4.5	980/28SA	980/28S	7	.6	16	.21	5.2
981/28A	981/28	8	.9	22	.24	4.8	981/28SA	981/28S	8	.9	22	.25	6.3

Additional cords available in tough TPE (Thermo Plastic Elastomer) with many of the properties of rubber and superior retractability.

NOTE: Retracted lengths are approximate, extended lengths are guaranteed.

DABURN ELECTRONICS & CABLE CORP. • 225 PEGASUS AVE. • NORTHVALE, N.J. • 201-768-5400 • FAX 201-768-9642

COMPUTER CABLE • WIRE • POSTS • PLUGS • CLIPS

DABURN

MINIATURE COMPUTER CABLE — SHIELD-PLUS™ MULTICONDUCTOR TO UL STYLE 2464

DESCRIPTION: Each conductor is #28 AWG 7/36 tinned copper, color coded, .009" wall of semi-rigid PVC (UL Style 1061, CSA Type S-R PVC). Conductors are twisted. Overall aluminum/polyester foil shield and 7 strand tinned copper drain wire, **plus** an overall braided shield of tinned copper (SHIELD-PLUS®). Gray PVC jacket overall. To UL Style 2464, FCC Docket 20780, MIL-STDS 461-462B.
Construction is flexible and suitable for computer, communication and control applications.
Cable resists acids, alkalis, oil, solvents, moisture and fungus.
TEMPERATURE RANGE: – 20°C to + 80°C.
VOLTAGE RATING: 300V.
FLAMMABILITY: Passes UL VW-1.

DABURN Cat. No.	No. of Cond.	Nom. Jacket Wall Inches	Nom. Jacket Wall mm	Nominal O.D. Inches	Nominal O.D. mm
2928	2	.032	.81	.170	4.30
2928/3	3	.032	.81	.175	4.40
2928/4	4	.032	.81	.185	4.70
2928/6	6	.032	.81	.205	5.20
2928/8	8	.032	.81	.215	5.40
2928/10	10	.032	.81	.240	6.10
2928/15	15	.032	.81	.265	6.70
2928/20	20	.032	.81	.285	7.20
2928/25	25	.032	.81	.310	7.80
2928/50	50	.032	.81	.395	10.10

STANDARD PUT-UP: 500 Ft., 1000 Ft.
COLOR CODE: Chart F.
Additional constructions to order.

COMPUTER CABLE MULTICONDUCTOR FOIL SHIELD

DESCRIPTION: Each conductor is #24 AWG 7/32 tinned copper, color coded, .009" wall of semi-rigid PVC (UL Style 1061, CSA Type S-R PVC). Conductors are twisted. Overall aluminum/polyester foil shield and 7 strand tinned copper drain wire. Cable is jacketed with gray PVC. To UL Style 2464.
Construction is suitable for computer, communication and control applications.
Cable resists acids, alkalis, oil, solvents, moisture and fungus.
TEMPERATURE RANGE: – 20°C to + 80°C.
VOLTAGE RATING: 300V.
FLAMMABILITY: Passes UL VW-1.

DABURN Cat. No.	No. of Cond.	Nom. Jacket Wall Inches	Nom. Jacket Wall mm	Nominal O.D. Inches	Nominal O.D. mm
2980	2	.032	.081	.164	4.17
2980/3	3	.032	.081	.168	4.29
2980/4	4	.032	.081	.185	4.70
2980/6	6	.032	.081	.210	5.33
2980/8	8	.032	.081	.225	5.72
2980/10	10	.032	.081	.250	6.35
2980/15	15	.032	.081	.280	7.11
2980/20	20	.032	.081	.305	7.75
2980/25	25	.032	.081	.345	8.76
2980/50	50	.032	.081	.445	11.30
2980/60	60	.032	.081	.475	12.07

STANDARD PUT-UP: 100 Ft., 500 Ft., 1000 Ft.
AVAILABLE TO ORDER: Overall polyester foil shield and braid; plenum constructions.
COLOR CODE: Chart F.
NOTE: Low Cap. Cables are available to order.

DAFLEX ULTRA FLEXIBLE SUB-MINIATURE WIRE

U/L STYLE 1568, 1692

Daflex ultra flexible sub-miniature hook-up wire is designed for continuous flexing applications, such as data processing, mercury thermostats, magnetic memory drums and rotation servo platforms. It offers superior limpness and flexing characteristics.
DESCRIPTION: Stranded soft bare copper conductor, insulated with a special formulation of flexible PVC to minimize kinking and fatigue.
OPERATING TEMPERATURE: –40°C to +80°C. U/L 1568 voltage rating: 30V.

DABURN Cat. No.	AWG	Strand	Nom. Wall	Max. Volt	Nom. O.D.
2671/36	36	7/44†	.005"	150	.016"
2671/32	32	18/44	.007"	300	.023"
2671/30	30	28/44	.010"	600	.031"
2671/29	29	51/46	.008"	300	.032"
2671/28*	28	41/44	.010"	600	.035"
2671/27*	27	48/44	.010"	600	.037"
2671/26*	26	66/44	.010"	600	.042"
2671/24*	24	105/44	.010"	600	.045"
2671/22*	22	168/44	.010"	600	.052"
2671/20*	20	266/44	.010"	600	.061"
2671/18*	18	420/44	.010"	600	.072"

* To U/L Style 1568. (150V) † Silver Plated Copper.
STANDARD PUT-UP: 1000 Ft.
STOCK COLORS: Black, White, Red, Green. Additional colors to order.

PLASTIC KINKLESS TEST LEAD WIRE

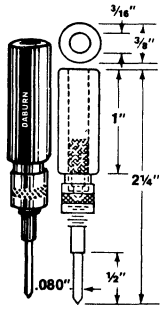
Soft formulation vinyl maximum flexibility. Temperature stability from – 80°C to + 105°C. Exceed requirements for MIL-I-3930A Type JP (PVC). Suitable for test leads, etc. Resistant to gasoline and oil. Excellent abrasion resistance.

OPERATING TEMPERATURE: – 80°C to + 105°C, 5000V rating.
DESCRIPTION: One conductor tinned copper stranded, special formulation vinyl insulation — smooth surface.
COLORS: Black, Red, Yellow, Green, White, Blue.

DABURN No.	Size	Strand	Ins.	Nom. O.D.
2722/22	22	26/36	.032"	.100"
2722/20	20	26/34	.032"	.104"
2722/18	18	65/36	.032"	.112"
2722/16	16	65/34	.032"	.129"

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

INSULATED PHONE TIP PLUG MIL-C-28901/5



SOLDERLESS JUNIOR & SENIOR (MIL-C-28901/5)

Fits any standard phone tip jack. Brass, nickle plated body. Solderless connection for wire which fits thru body of tip and secured under knurled nut. Shock resistant plastic handle.

COLORS: Red, Black, Yellow, Green, Blue. (Specify)

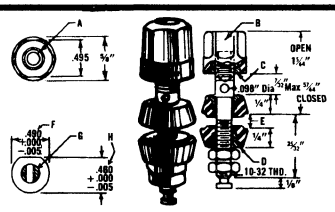
DABURN No.		Std. Pkg.
19-15	Junior	50
19-09	Senior	50

30 AMP BINDING POSTS — MULTI-PURPOSE Wrap Around

Molded nylon body. Accepts tip plug, spade lug, banana plug, wire, alligator clip and direct solder connection. Has molded-in brass inserts in head and washer. Rated at 30 amps. AC Capacitance 5.0 mmfd. Banana plug receptacle .161" I.D. head non-removable from stud and washer completely insulates post from panel. For panels 1/16" to ¼" thick; drill ½" hole for mounting washers. Wire hole is at right angle to flat on insulated washer. Brass nickel plated. Gold plating to order.

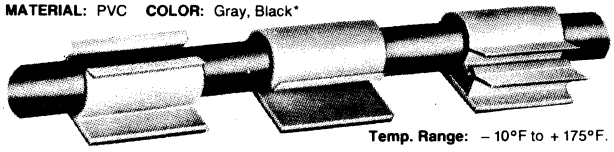
COLORS: Red, Black. (Specify)

DABURN No.	Std. Pkg.
18-72 Fluted Head Post	100
18-75 Hex-head Post	100

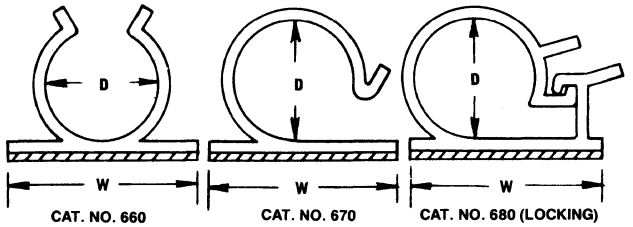


DABURN STIK KLIPS™ — SELF ADHESIVE

MATERIAL: PVC **COLOR:** Gray, Black*



Temp. Range: – 10°F to + 175°F.



CAT. NO. 660 **CAT. NO. 670** **CAT. NO. 680 (LOCKING)**

For fast secure mounting on smooth surfaces. No need to screw, nail or staple in place. Fastens in a flash — just peel off the protective backing and press in place on a clean, dry, smooth surface. For best results allow a few seconds for adhesive to set before applying load.

These plastic clips are insulating, strong and elastic. They have many uses, such as keeping telephone wires off the floor, holding wire, cable, tubing rods, etc. in position.

DABURN No.	D	W	Std. Pkg.
660-⅛	⅛"	¾"	100, 1000
660-¼	¼"	¾"	100, 1000
660-⅜	⅜"	¾"	100, 1000
660-½	½"	1"	100, 1000
660-¾	¾"	1"	100, 1000
670-⅛	⅛"	¾"	100, 1000
670-¼	¼"	¾"	100, 1000
670-⅜	⅜"	¾"	100, 1000
670-½	½"	1"	100, 1000
670-¾	¾"	1"	100, 1000
680-¼*	¼"	¾"	100, 1000
680-½	½"	1"	100, 1000
680-¾	¾"	1"	100, 1000

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COMMONLY USED ELECTRICAL/ELECTRONIC ABBREVIATIONS AND ACRONYMS

A
A/D acrylonitrile butadiene-styrene
A/D analog to digital
ADC analog to digital converter
ADP automatic data processing
AFC audio frequency control
AFT automatic filter test
ALGOL algorithmic language
AM a logical operator
AQL acceptable quality level
ASCII American national standard code for information interchange
ASIC application specific IC
ATE automatic test equipment
ATG automatic test generation
AWG American wire gauge

B
BALUN balanced to unbalanced
BASIC beginners' all-purpose symbolic instruction
BCD binary-coded decimal
BNC baby "N" connector
BUS basic utility syste

C
CAD computer-aided design
CAE computer-aided engineering
CAM computer-aided manufacture
CAMAC computer-automated measurement and control
CAPP computer-aided process planning
CAT computer-aided test
CATV cable television or community antenna television
CCC (leaded) ceramic chip carriers
CCD computer-controlled display
CERMET ceramic metal element
CIE computer-integrated engineering
CIM computer-integrated manufacturing
CLCC ceramic leadless chip carriers
CMOS complementary metal-oxide semiconductor
Comm. communications
CPS characters per second
CPU central processing unit

D
D/A digital to analog
DAC digital to analog converter
DBMS data base management system
DC direct current
DFT design for testability
DIAC bidirectional trigger diode
DIL dual in-line
DIN Deutsche Industrie Normenausschuss
DIP dual in-line package
DPM digital panel meter
DRAM dynamic RAM
DTL diode transistor logic

E
EDA electronic design automation
EDP electronic data processing
EBCDIC extended binary coded decimal interchange code
EEPROM electrically erasable PROM
EIA Electronic Industries Association
EMC electromagnetic compatibility
EMI electromagnetic interference
EMP electromagnetic pulse
EPROM erasable programmable ROM
ESR equivalent series resistance

F
FEP fluorinated ethylene propylene Copolymar, 200° Teflon
FET field-effect transistor
FM frequency modulation
FORTRAN formula translator

G
GaAsFET gallium arsenide FET
CMIP commn management information protocol
GPIB general purpose interface bus
GPS global positioning system

H
HF high frequency (3 to 30 MHz)
HIPOT test, measurement, and diagnostic equipment
HLL high level language
HV high voltage
Hz Hertz

I
IAB Internet Activities Board
IC integrated circuit
IDC insulation displacement contact
IF intermediate frequency
IO input/output (devices)
IR insulation resistance (or) infrared
ISDN integrated services digital network
ISO International Standards Organization

J
JEDEC Joint Electronic Device Engineering Council
JFET junction FET
JMOS junction MOS

K
kHz kilohertz (10^3 hertz)
KSR keyboard send /receive

L
LAN local area network
LC (filters) inductance/capacitance
LCC leaded chip carrier
LCD liquid crystal display
LED light-emitting diode
LF low frequency (30 to 300 kHz)
LIF low insertion force
LNA low noise amplifier
LNB low noise band
LSI large scale integration
LVDT linear velocity displacement transformer

M
MASER microwave amplification by stimulated emission of radiation
MATV master antenna television
µF microfarad
MHz megahertz
MIC microwave IC
MIPS million instructions per second
MIB microcomputer interface board
MOS metal oxide semiconductor
MOSFET metal oxide semiconductor FET
MOSIGT metal oxide semiconductor insulated-gate transistor
MOV metal oxide varistor
MPU microprocessor unit
MSI medium scale integration

N
NBS National Bureau of Standards
NEMP nuclear electromagnetic pulse
NIM national instrumentation module
NOR not OR
NTC negative temperature coefficient

O
OCR optical character reader
OEM original equipment manufacturer
OR a logical operator
OSI open systems interconnection

P
PAL programmable array logic
PC printed circuit
PCB printed circuit board
PCM pulse code modulation
PCS plastic clad silica
pF picofarad
PGA pin grid array
PIN positive-intrinsic-negative (transistor)
PLA programmable logic array
PLCC plastic leaded chip carrier
PLL phased lock loop
PPI plan position indicator
PROM programmable ROM
PTC positive temperature coefficient
PUT programmable unijunction transistor

Q
QAM quadrature amplitude modulation
Q (meter) quality-factor meter

R
RAM random access memory
RC resistance-capacitance
RFI radio frequency interference
RMS root mean square
ROM read only memory
RF radio frequency
RFC radio-frequency choke
RFI radio-frequency interference
RTD resistance-temperature detector
RTL resistor transistor logic
RTV room temperature vulcanizing
RW read/write

S
SAS silicon asymmetrical switch
SBC single board (micro) computer
SBS silicon bilateral switch
SCR silicon-controlled rectifier
SCS silicon-controlled switch
SDA source & detector assemblies
SGMP simple gateway monitoring protocol
SIDAC bidirectional voltage-triggered switch
SIMM single in-line memory module
SIP single in-line package
SMD surface mount device
SMT surface mount technology
SNMP simpole network management protocol
SO small outline
SOIC small outline IC
SOT small outline transistor
SSI small scale integration
SSR solid-state relay
STL Schottky transistor logic
SUS silicon unilateral switch

T
TC temperature coefficient
TCE thermal coefficient of expansion
TXCO temperature compensated crystal oscillator
TFE tetrafluoride ethylene propylene Copolymer, 250° Teflon
TRIAC bidirectional AC switch
TTL transistor-transistor logic
TTY teletypewriter

U
UHF ultra high frequency (300 MHz to 3 GHz)
UJT silicon unijunction transistor
UL Underwriters Laboratory
UPS uninterruptible power supply

V
VAC volts (of) alternating current
VAN value-added network
VAR volt-ampere reactive
VCR video cassette recorder
VDC volts (of) direct current
VHF very high frequency (30 kHz to 300 MHz)
VHSIC very high speed integrated circuit
VLF very low frequency (3 to 30 kHz)
VLSI very large scale integration
VME virtual machine environment
VRM voice recognition module
VTVM vacuum tube volt meter
VU volume unit
VSWR voltage standing wave ratio

W
WPS word processing software

Y
YIG yttrium iron garnet

Z
ZIF zero insertion force

General Cable

Engineered Cordset Division
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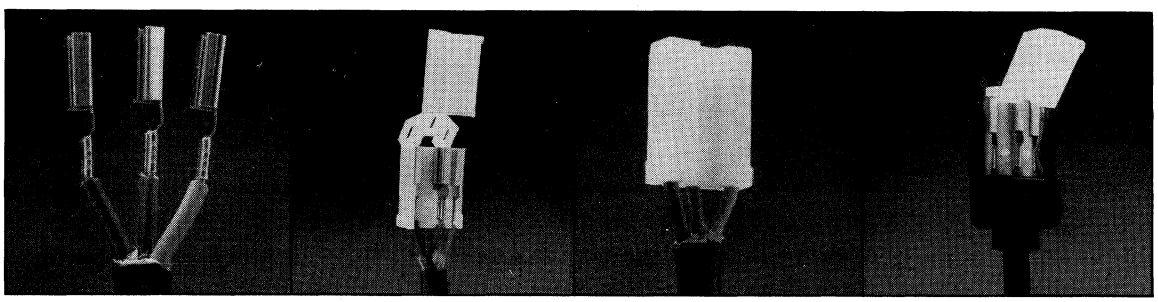
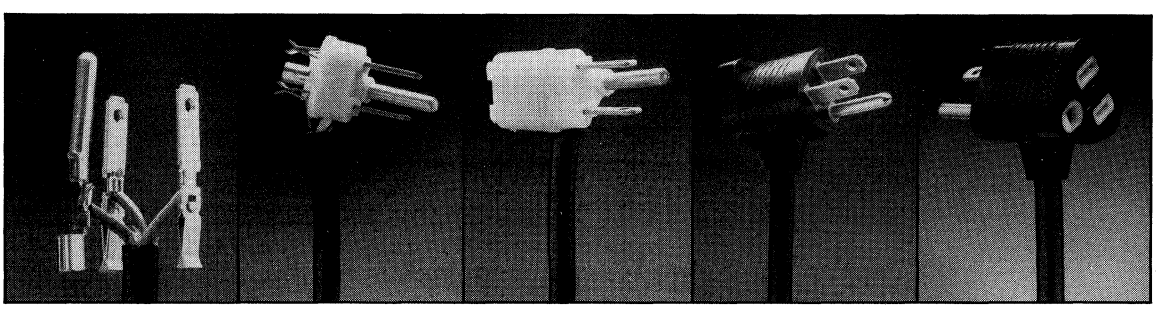
WE DESIGN CORDSETS TO YOUR SPECS—AND TO OUR HIGH STANDARDS.



Our unique electrical protection enclosure eliminates flashing and the hazard of stray copper strands resulting in maximum safety and reliability.



100% electrically tested for continuity load, dielectric strength and resistance.

UL tested and CSA certified. All General Cable cordsets are appropriately labeled.

Crimp integrity - "B" Crimp provides uniform copper connection for greater mechanical strength and improved electrical contact. Crimp on both wire and insulation provides high performance wire crimp plus strain relief.

Electrical protection barriers prevent the possibility of loose strands reaching molded surfaces.

Our engineering department is available to discuss your specific cable needs and custom-design to your specs.

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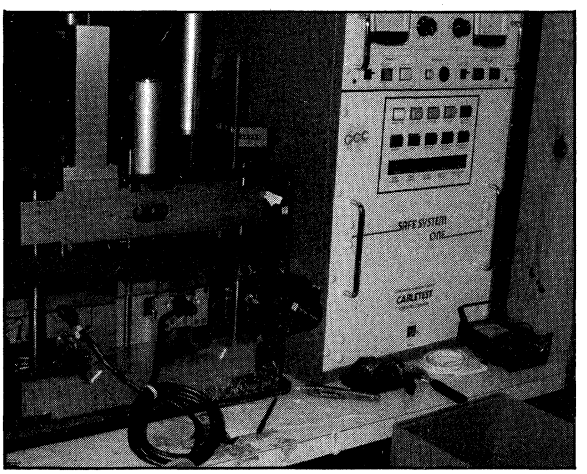
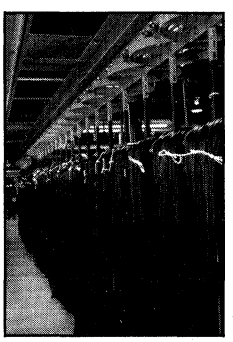
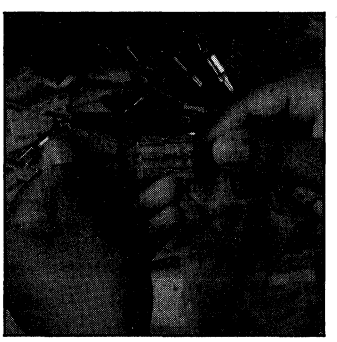
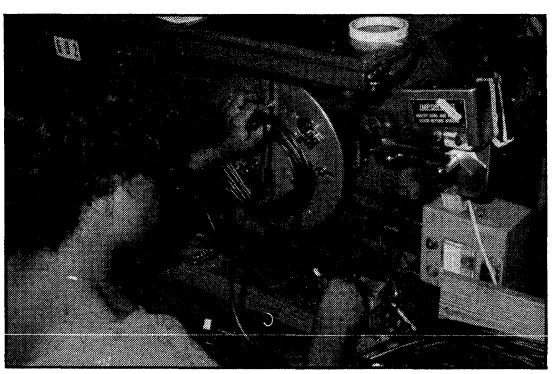
Plug-in for reliability and safety...Nowhere is the demand for quality more evident than in the dynamic electronic industry. All electrical and electronic power supply cordsets manufactured by General Cable are listed by Underwriters Laboratories and certified by the Canadian Standards Association. These listings are your assurance that all components of the product...cordage, plugs, connectors...including manufacturing and assembly procedures have been inspected and approved as meeting specific performance and construction standards. Our quality control extends through every step of the manufacturing process.

General Cable continues to meet the challenge...For over fifty years General Cable has been manufacturing a full line of power supply cordsets for Original Equipment Manufacturers. All of our cordsets are manufactured in the U.S.A. With a wide selection of plug and connector tooling available, we are equipped to furnish products to your specifications or to develop new designs to meet your particular requirements. A wide variety of molds and our "In-House" inventory of wire result in cost effectiveness and allow us to respond quickly to your required lead times.









At General Cable, we believe service, cooperation and an appreciation of our customer's priorities are extremely important. Whatever your cordset requirements, we invite you to contact our Customer Service and Engineering personnel early in the design and procurement process. Our experience in servicing similar requirements can help you anticipate problems, cut costs and lead to an optimal design for your cordset.

- "Zero Defects" Quality Assurance
- "Just in Time" Delivery Program
- EDI Capabilities

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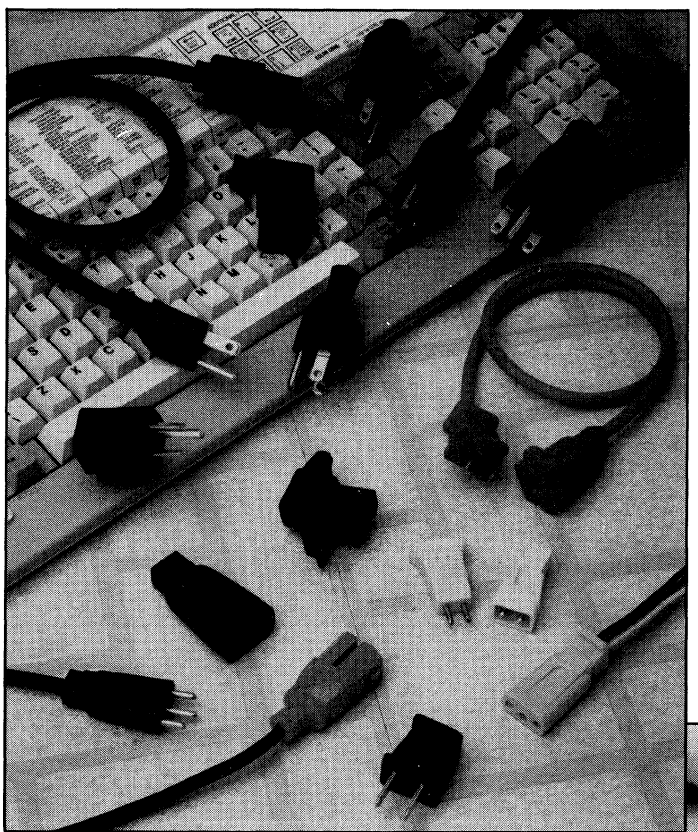

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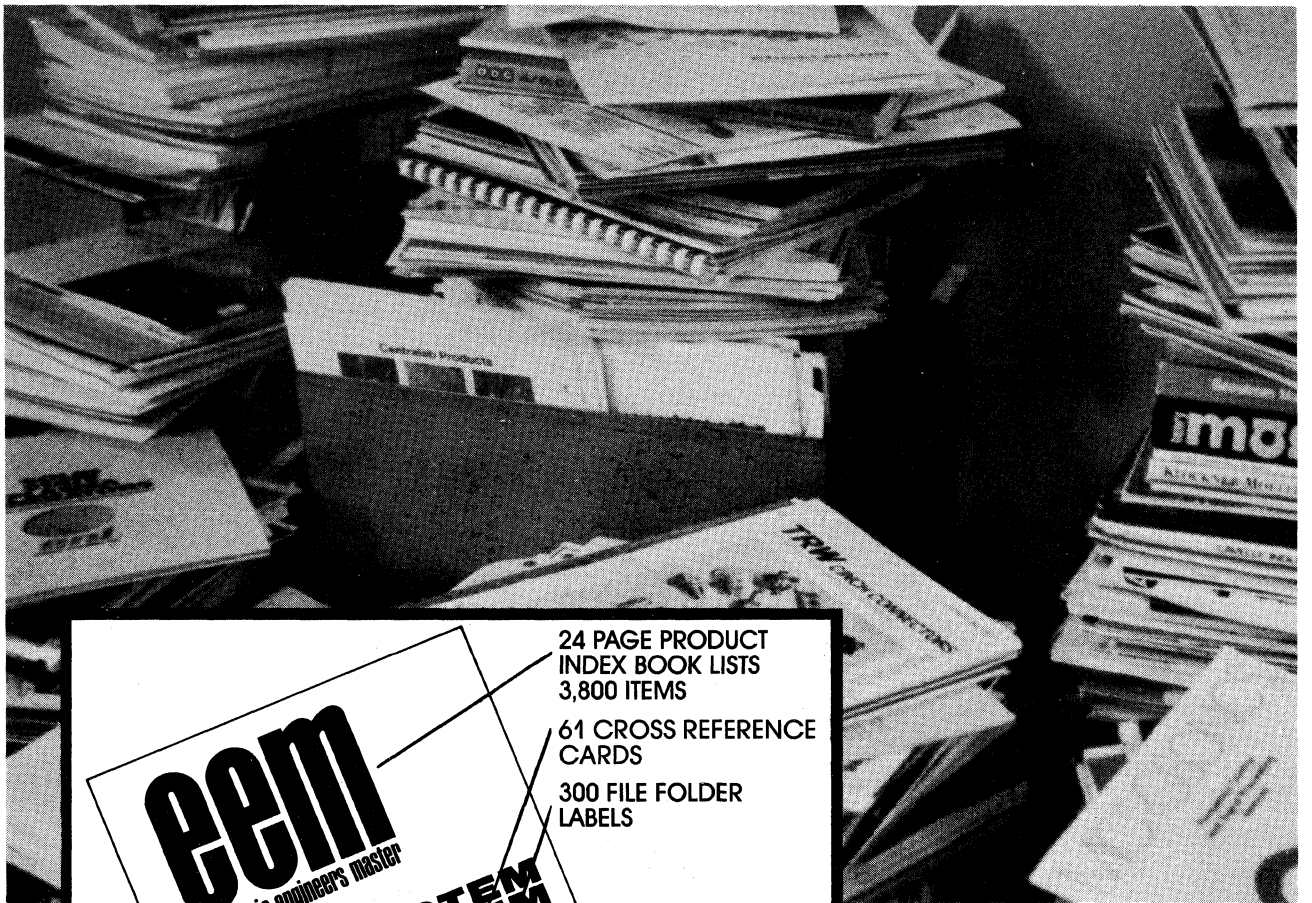
- MECHANICAL CONNECTORS
- MOLDING COMPOUNDS
- COLORS



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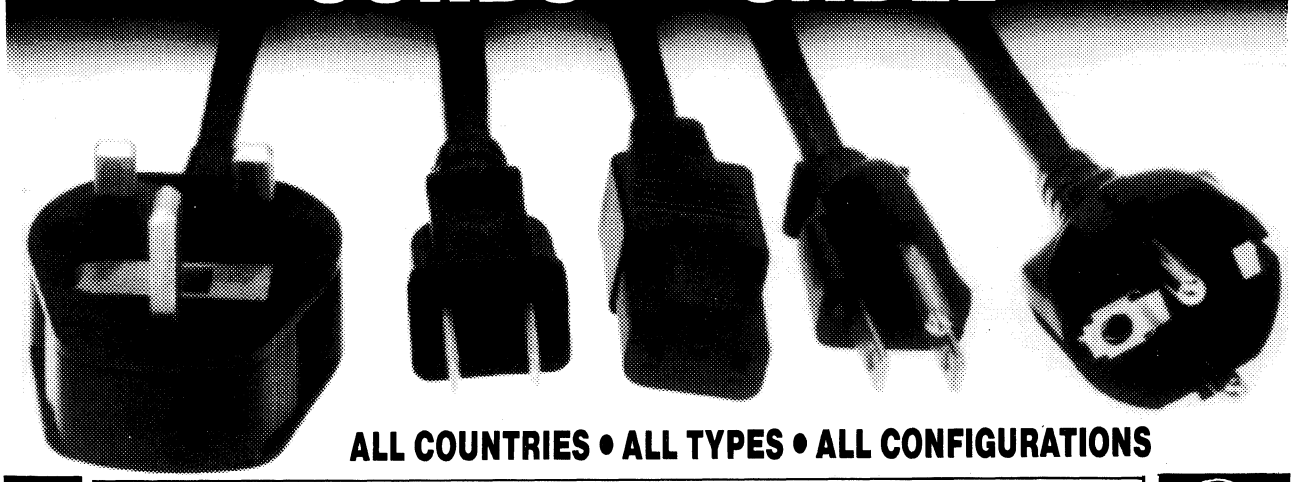
CORDSETS CORDS AND CABLE



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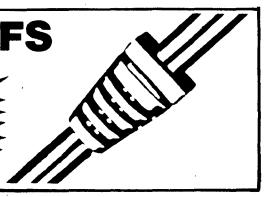

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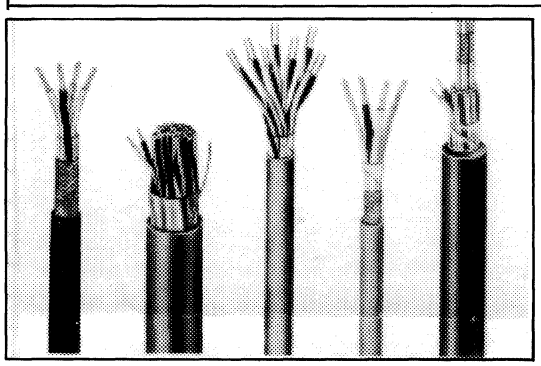

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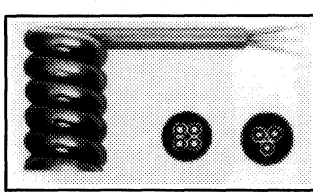

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GSI Woven Cable is produced to order and shipped on spools in continous lengths, as straight or branched harnesses, or as elements of complex assemblies.

Weave Patterns and materials are engineered to provide attributes such as wide or close spacing between conductors, flexibility or rigidity, permanent bonding or fast and easy lead separation.

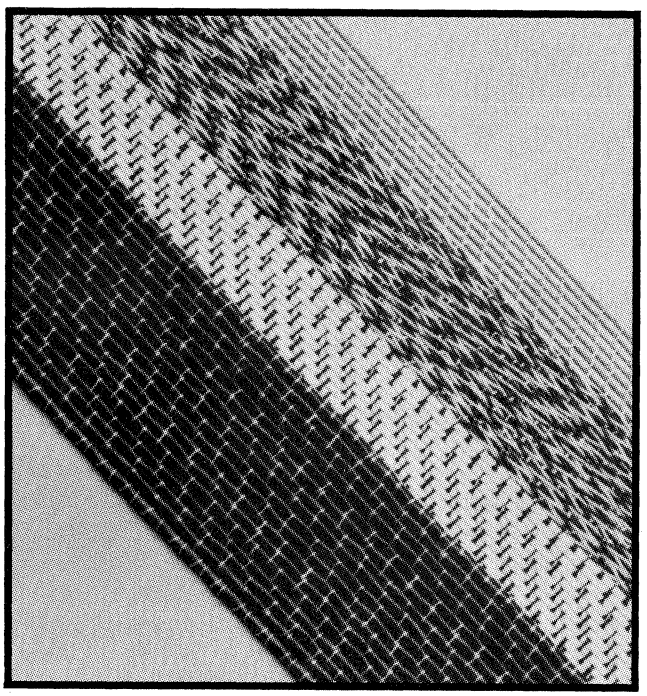
Conductor Types have virtually no limit. Wire may be MIL spec or UL listed of many formulations. Twisted pairs, triplets, coax and other constructions are readily handled. Flexible conductors of 10 AWG to 40 AWG are standard.

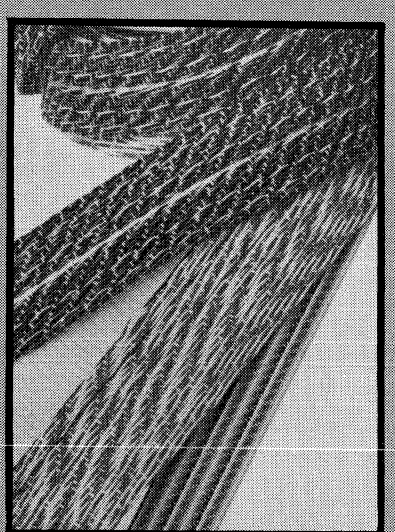
Color Coding options are many and varied. NEMA color sequence is a popular choice for wire, but other combinations are available for conductors and weave material.

Space and Weight are saved with woven cable. Weave elements such as Kevlar provide strength; and flat designs require less space than round cables.

Mixing of Components is a unique feature of woven cable. Conductors of different sizes or constructions can be placed side by side in the same cable.

Wire Preparation is made easy and fast without risk of damage to components. Wires are individually insulated. Color coding and placement of conductors makes identification nearly foolproof.





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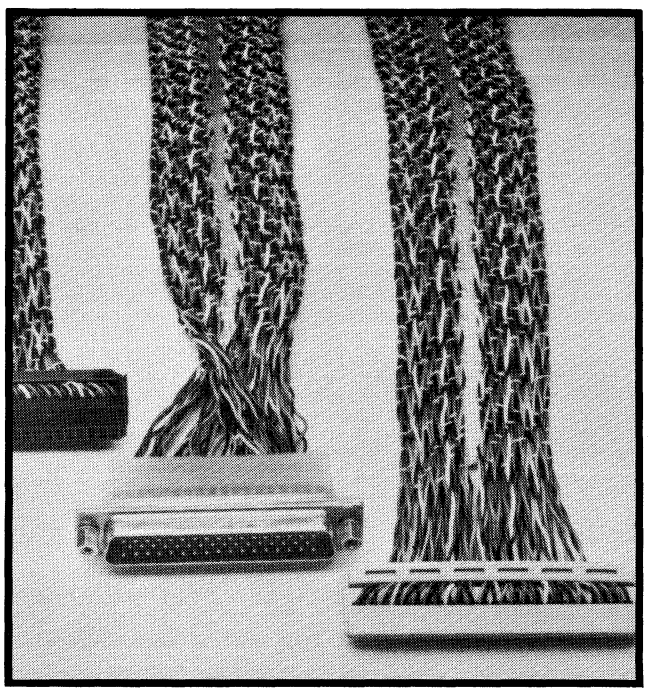
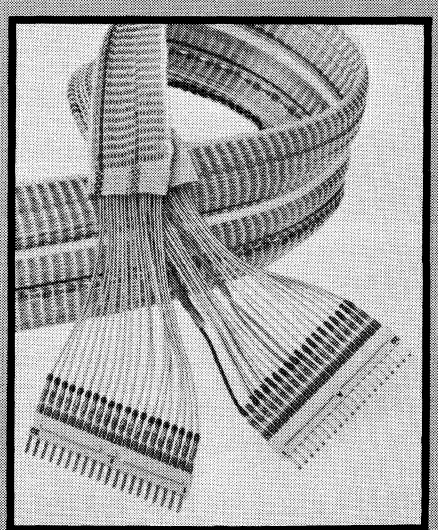
HIGH PERFORMANCE WOVEN CABLE SYSTEMS

GSI CORPORATION





Programmed Harnesses provide dimensional accuracy at low cost. These machine made assemblies look great, work perfectly, and save on installation time.

Cut or Fold Lines can be designed-in to allow for rapid separation of groups of wires and the folding and stacking of woven elements.

Multiple Layers may be utilized so that the cable assumes a space-efficient box shaped cross section.

UL Labeling is available for GSI wire and for GSI woven cable and harness assemblies.

Terminations are available in a wide range of industrial and military styles. Woven cable is easily adapted to mass termination systems.

Composite Construction combines diverse technologies. Flat woven cable may be combined with contrahelically twisted round cable and other construction methods to achieve optimum design and performance.

MIL-Spec procedures and processes guarantee satisfaction on military jobs. Inspection to MIL-I-45208A, high reliability soldering to MIL-S-45743E and calibration to MIL-STD-45662 are integral to GSI's operations.

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GSI CORPORATION

HIGH PERFORMANCE INTERCONNECTION SYSTEMS

Complex Assemblies are produced from customer drawings by skilled operators. Assembly and test operations are performed in appropriate controlled environments.

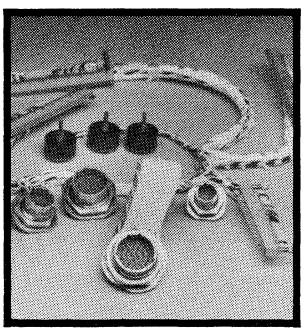
Shields and Jackets may be braided onto both round and flat cable. RFI, EMI, EMP and Tempest requirements are met with multiple layers of dense shielding.

Wire Markers have been a GSI specialty for over 20 years. Products include both shrinkable and non-shrinkable tubing in a number of standard colors. Cable ties and marker plates are also permanently imprinted.

Color Banding is a superior process for marking fine wire for military aircraft and other high technology applications. Up to five colored bands make up to 100,000 discrete color codes available for white wire from 12 AWG to 30 AWG. GSI color banded wire is used in advanced U.S. military aircraft and submersibles.

Soldering is done by certified operators in designated clean facilities with controlled temperature, humidity and air pressure. Equipment includes resistance reflow soldering systems for mass terminations.

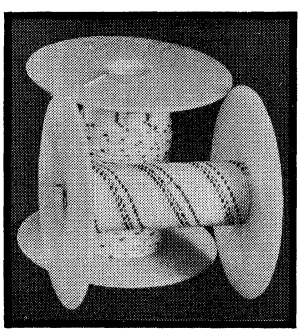
Testing and Certification are available for all GSI products. Hi-pot and electronic tests may be specified in addition to standard continuity and spark tests. Abrasion, pull, hardness and other mechanical tests are routinely performed.



COMPLEX ASSEMBLIES

SHIELDS AND JACKETS

WIRE MARKERS



COLOR BANDING

System Integration is another option offered by GSI. Cable assemblies may be combined with termination devices, other hardware and cabinetry to form complete assemblies or major subassemblies. GSI's complementary skills and technologies ensure competitive price and delivery.

Technical Support is available for the asking. GSI's engineering staff has expert knowledge and can work quickly to solve problems. And, since GSI is not wedded to one technology, each problem is approached objectively.

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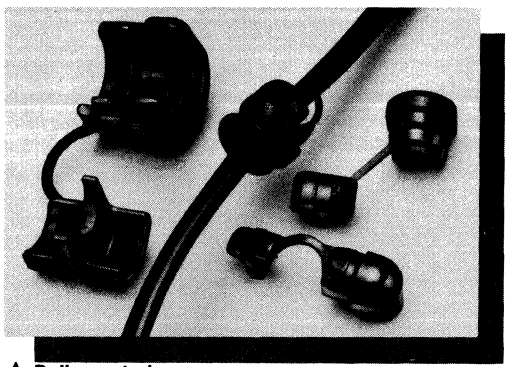

▲ Relieve strain...

Strain Relief Bushings insulate and protect cables against pull, push, flex and twist. 63 sizes.

- Straight-through.
- Bell-mouth.
- Right angle.
- International.

▼ Seal out liquids...

Liquid Tight Fittings seal on cable or tubing. 10 sizes for diameters of 3/32" to 1". VDE and SEV accepted. Flex extender prevents sharp bends.

- Regular Liquid Tight Fitting.
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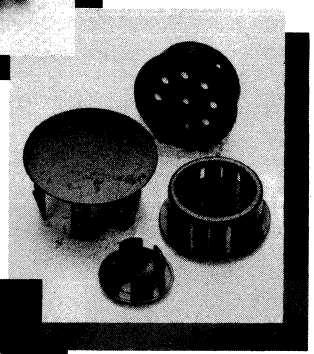

Plug holes... ▶

Hole, Vent and Pry-out plugs close unneeded holes and provide needed ventilation. 21 sizes for 1/4" to 2 1/2" diameter holes.

- Vent Plug.
- Hole Plug.
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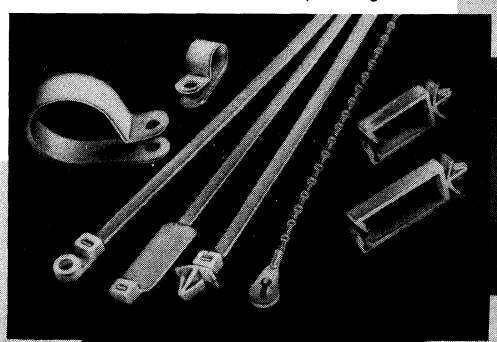
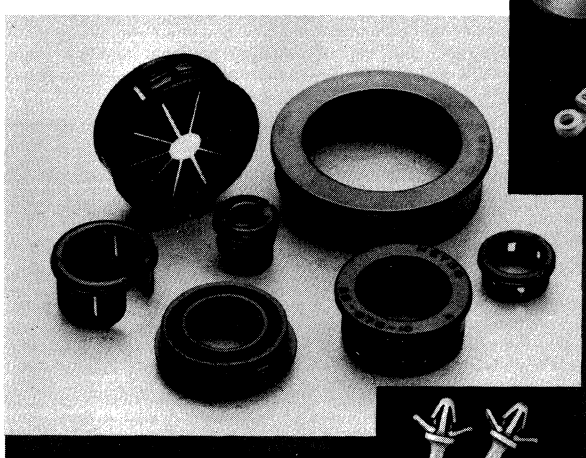


Gather and tie...

Cable Ties, Holders and Clamps bundle, anchor and direct cables, tubings, etc.

- Cable Clamp.
- Nylye® Cable Tie.
- Beaded Wire Tie.
- Wire & Cable Holder.



Insulate cables...

Insulating Bushings in 73 sizes and types to protect cables from raw-edged holes. Finger-tip installation.

- Shorty Bushing.
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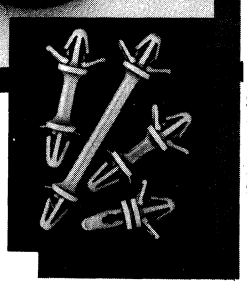
- Snub Bushing.



Connect wires... ▶

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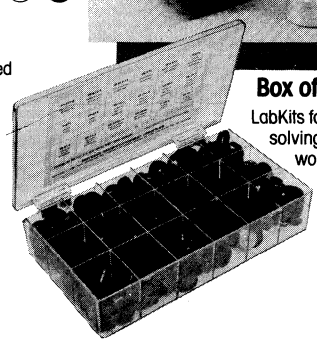

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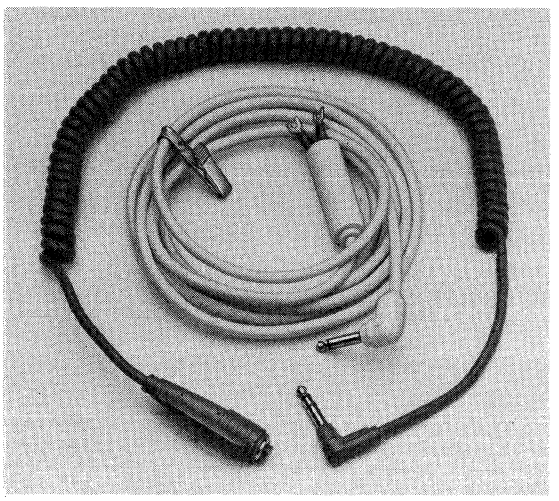

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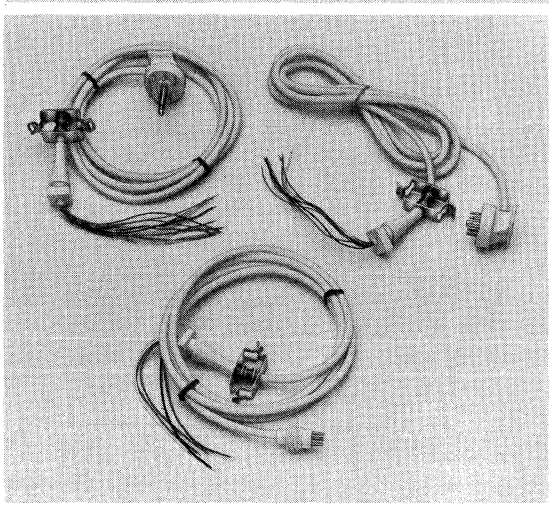
DESIGN OPTIONS

CABLE

- Conductor Type
  - Solid, Stranded, & Gauge
  - Number of Conductors
  - Paired or Unpaired
- Dielectric Type
- Types of Shields
  - Braided Copper
  - Foil/Drain Wire
  - Foil/Braid
  - 100% Shield
- Insulation of Conductors & Jacket
- Other

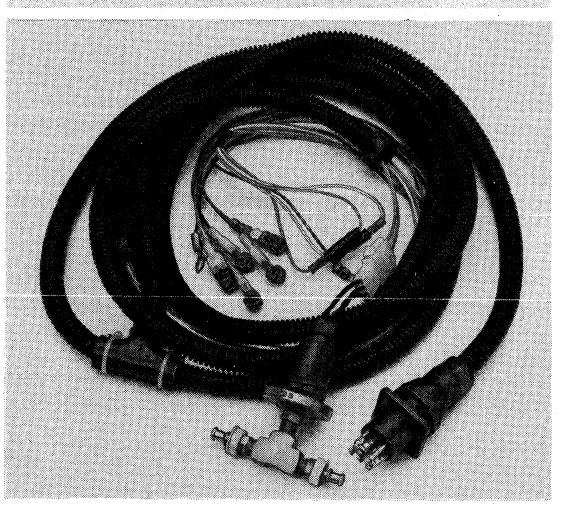
TERMINATION

- Stripped and Tinned
- Terminals
- Connectors
- Other



CONNECTORS

- AUDIO
- F CONNECTORS
- BNC
- TNC
- DIN CONNECTORS
- D SUB CONNECTORS
- UHF
- PCB MOUNT COAXIAL

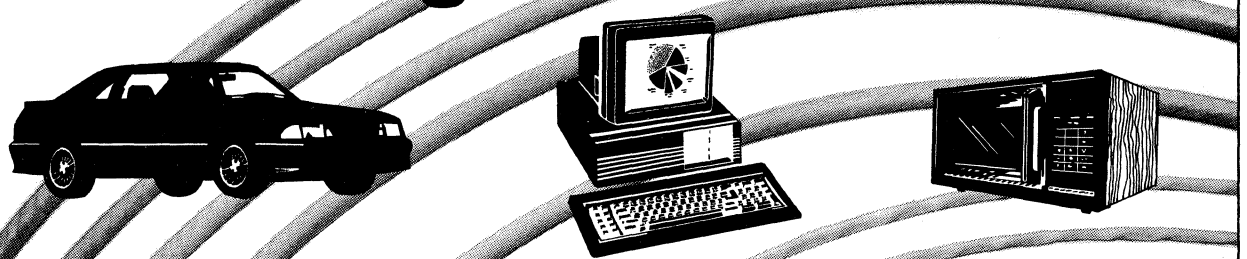


WE WELCOME SHORT PRODUCTION RUNS

SEE OUR OTHER PAGES IN SECTIONS 1500, 2100, 4100 & 5600

Judd Wire

WIRE TO WIRE... Superior Performance Through Irradiation



Engineered to Stringent Underwriters Laboratory and Canadian Standards Association Requirements.

- PCA Universal Hook-up Wire
- FLEXRAD 125®
- FLEXRAD HV

For over 13 years PCA Universal Hook-up Wire, manufactured by Judd Wire, has answered the need for less expensive wire insulations by combining high performance characteristics with economical prices.

PCA (polychloroalkene) is constructed with an exclusive irradiation cross-linked PVC that offers high heat and burn-through resistance, a wide continuous operating temperature range, from −55 °C to 105 °C, improved chemical and flame resistance properties, and superior processability.

High technology and careful engineering led to the development of FLEXRAD 125, an irradiation cross-linked polyethylene wire and cable for applications in the temperature range of −55 °C to 125 °C. Processed with tinned copper conductors, FLEXRAD 125 provides an ideal alternative to the problems of fluocarbon insulations.

Outstanding features are:

- Excellent operation at cold temperatures.
- Superior cut-through resistance.
- Easy strippability
- Long continuous lengths
- Maximum flexibility.

FLEXRAD HV is the high voltage lead wire of choice for electronics, appliances, test equipment, and instrumentation.

FLEXRAD HV has superior irradiation cross-linked polyethylene insulation, 5KV to 40KV applications, and is rated for use at 105 °C. In addition, FLEXRAD HV is a problem solver — its flexibility makes it easy to install in tight spaces, and, like all Judd irradiated products, it resists shrink back and melting even when in contact with a soldering iron.

Substantial savings in initial cost, space, and wire weight are usual when FLEXRAD HV is used.

APPLICATION GUIDE

- Business Machines and Networks
- Communications
- Computers
- Data Processing Systems
- Industrial Controls
- Instrumentation
- Medical Electronics
- Motor Leads
- Test Equipment
- Transformers

To discuss your requirements, please write or call us.

JUDD WIRE INC.

Turnpike Road, Turners Falls, MA 01376
Telephone (413) 863-4357 • FAX (413) 863-2305

SYMBOLS USED BY INTERNATIONAL REGULATORY AGENCIES

These symbols appear on many electrical/electronic components distributed in the world market. They indicate that a country's standard-setting agency has approved the design of the component and/or a testing agency has approved the performance of the component in meeting the standard. This page lists only those countries that have a *symbol* to represent their authority.

Argentina (IRAM) Instituto Argentino de Racionalization de Materiales

Australia (SAA) Standards Association of Australia

Austria (ÖVE) Öesterreichischer Verband für Elektrotechnik

Belgium (CEB) Comité Electrotechnique Belge

Brazil (ABNT) Associação Brasileira de Normas Teonicas

Canada (CSA) Canadian Standards Association

Czechoslovakia Urad pro Normalizaci a Mereni (Office for Standards and Measurements)

Denmark (DEK) Dansk Elektroteknisk Komite (Danish Electrotechnical Committee)

Egypt (EOS) Egyptian Organization for Standardization and Quality Control

Finland (SETI) Electrical Inspectorate

France (UTE) Union Technique de l'Électricité

Germany, Democratic Republic of (East) (ASMW) Amt für Standardi-sierung Messwesen und Warenprufung (Office for Standardization, Metrology and Quality Control)

Germany, Federal Republic of (West) (DKE) Deutsche Electrotechnische Kommission im DIN und VDE (German Electrotechnical Commission of DIN and VDE)

Greece (ELOT) The Hellenic Organization of Standardization

Hong Kong Hong Kong Standards & Testing Centre

Hungary (MSZH) Magyar Szabvanyugi Hivatal (Hungarian Office for Standardization)

India (ISI) Indian Standards Institute "Manak Bhavan"

Indonesia Badan Kerjasama Standardisasi LIPI-YDNI (LIPI-YDNI Joint Standardization Committee)

Iran Institute of Standards and Industrial Research of Iran

Ireland (IIRS) Institute for Industrial Research and Standards

Israel (SII) Standards Institution of Israel

Italy (CEI) Comitato Elettrotecnico Italiano (Italian Electrotechnical Committee)

Japan (JISC) Japanese Industrial Standards Committee Agency of Industrial Science and Technology

Korea, Republic of (South) Industrial Advance Administration

Mexico (DGN) Dirección General de Normas Secretaria de Patrimonio y Fomento Industrial Puente de Tecamachalco

Netherlands (NEC) Nederlands Elektrotechnisch Comite

New Zealand (SANZ) Standards Association of New Zealand

Norway (NEK) Norsk Elektroteknisk Komite (Norwegian Electrotechnical Committee)

Pakistan Pakistan Standards Institution

Poland Polski Komitet Normalizacji Miar i Jakosci (Polish Committee for Standardization, Measures and Quality Control)

Portugal (CEP) Comissão Electrotécnica Portuguesa

Romania Institutul Roman de Standardizare (Romanian Standards Institute)

Singapore Singapore Institute of Standards and Industrial Research

South Africa (SABS) South African Bureau of Standards

Spain (IRANOR) Instituto Nacional de Racionalización y Normalización

Sweden (SEK) Svenska Elektriska Kommissionen (Swedish Electrotechnical Commission)

Switzerland (SEV) Schweizerischer Elektrotechnischer Verein Postfach

Turkey (TSE) Turk Standardlari Enstitusu (Turkish Standards Institution)

United Kingdom (BSI) British Standards Institution

United States (ANSI) American National Standards Institute

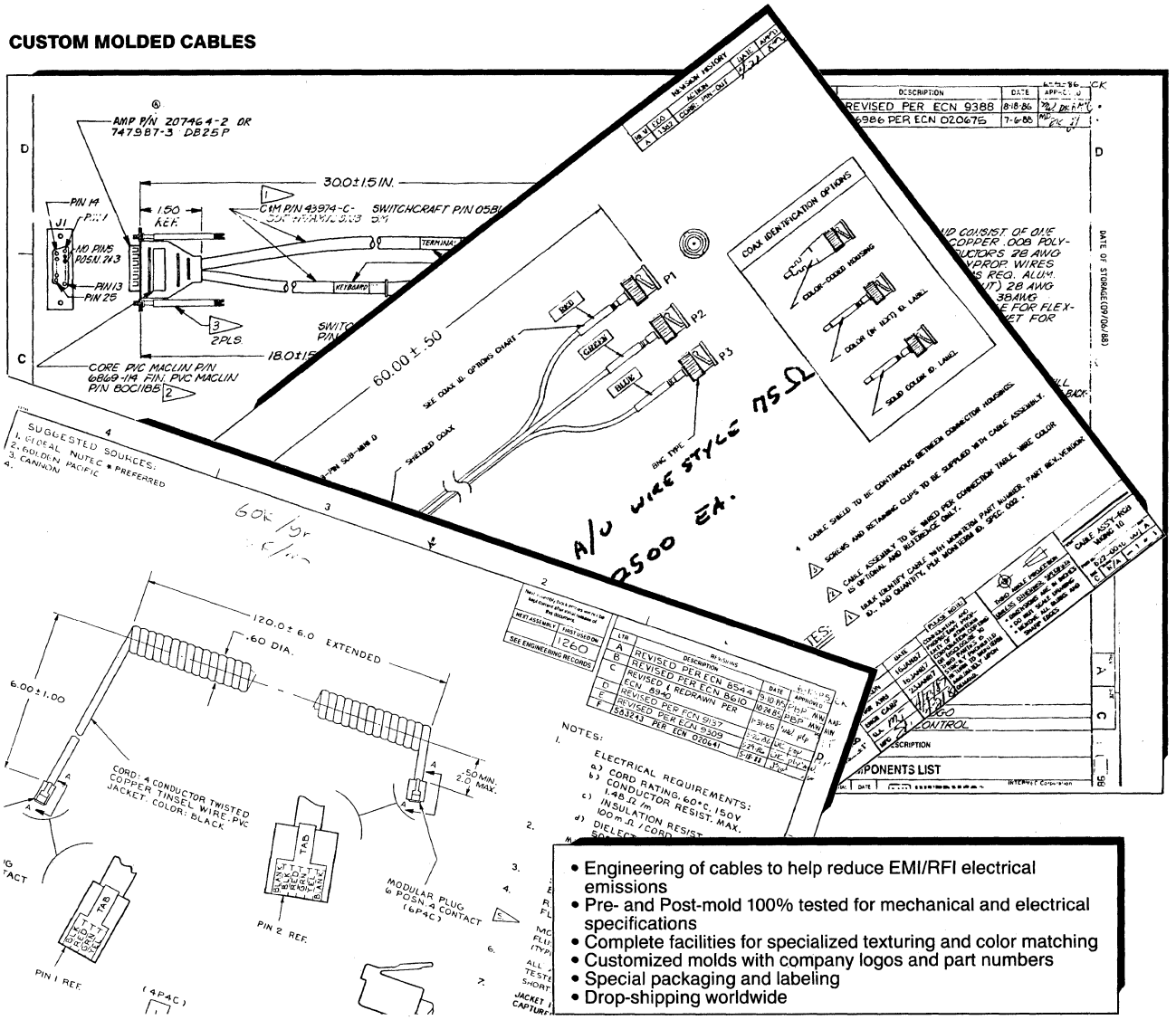
United States (NEMA) National Electrical Manufacturers Association

Venezuela CODELECTRA en Conjunto con COVENIN Avda. Ppal.

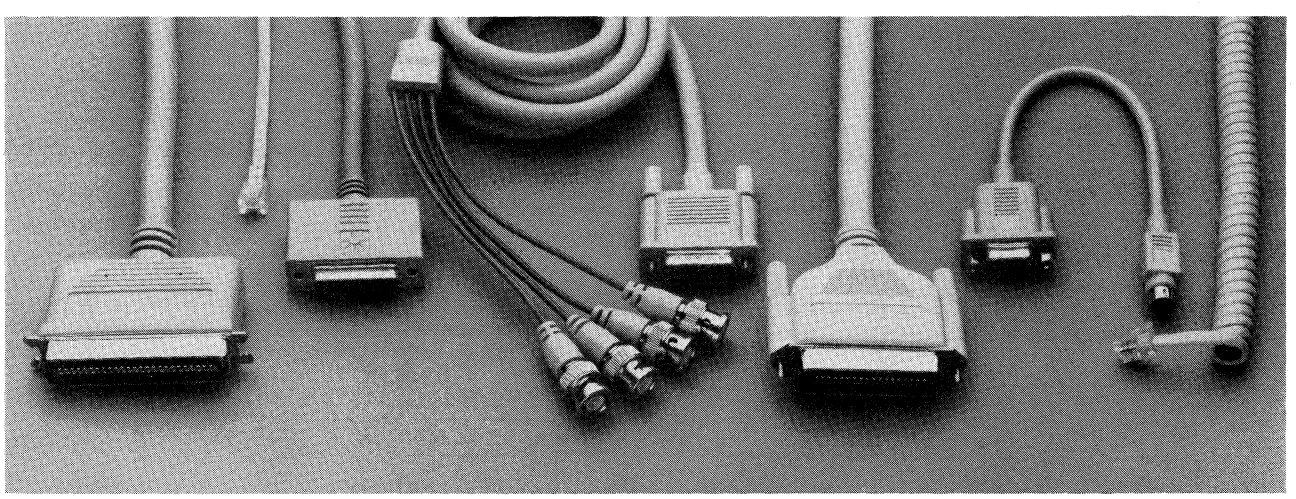
Yugoslavia Federal Institute of Standardization

KYCON CABLE AND CONNECTOR, Inc.

CUSTOM MOLDED CABLES



- Engineering of cables to help reduce EMI/RFI electrical emissions
- Pre- and Post-mold 100% tested for mechanical and electrical specifications
- Complete facilities for specialized texturing and color matching
- Customized molds with company logos and part numbers
- Special packaging and labeling
- Drop-shipping worldwide

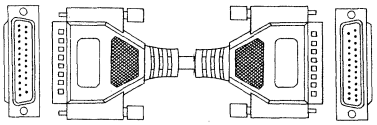


KYCON 1772 Little Orchard St., San Jose, CA 95125 (408) 295-1110 FAX: (408) 295-8054 Outside CA: (800) 544-6941

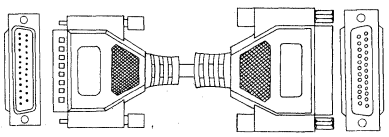
COMPUTER INTERFACE CABLES

STANDARD & CUSTOM MOLDED CABLE ASSEMBLIES

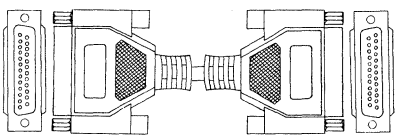
DB25MM6
DB25 male to male fully loaded, 6 ft length, molded or assembly type



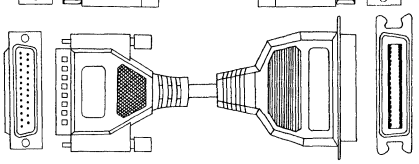
DB25MF6
DB25 male to female fully loaded, 6 ft length, molded or assembly type



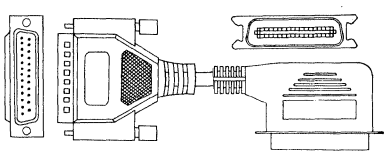
DB25FF6
DB25 female to female fully loaded, 6 ft length, molded or assembly type



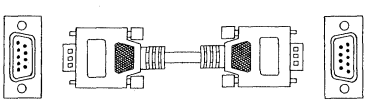
DB25M36M
Printer cable DB25M to 36 pin male, 6 ft long



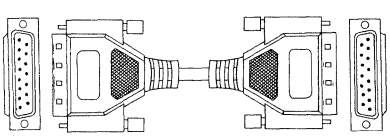
25M36MRA
Printer cable 6 ft with right 90° plug
25M36MLA
Printer cable, 6 ft with left 90° plug

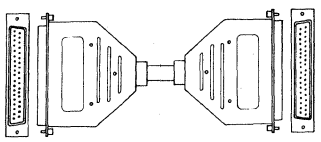


DB9MM6
DB9 male to male fully loaded, 6 ft
DB9MF6
DB9 male to female, 6 ft
DB9FF6
DB9 Female to Female 6 ft

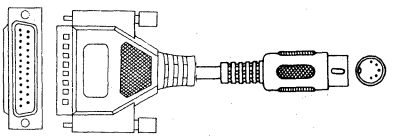


DB15MM6
DB15 male to male, 6 ft fully loaded
DB15FF6
DB15 female to female, 6 ft
DB15MF6
DB15 male to female, 6 ft

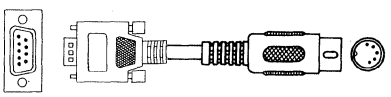




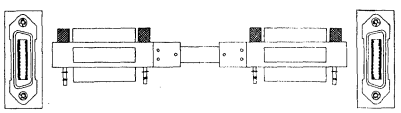
DB37MM6
DB37 male to male, 6 ft, molded or assembly type
DB37MF6
DB37 male to female 6 ft
DB37FF6
DB37 female to female 6 ft



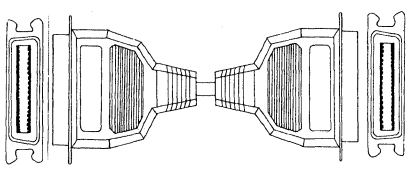
DB25M5PD6
DB25 male to 5 pin DIN plug 6 ft long molded or assembly type



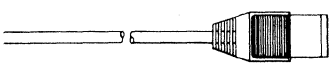
DB9M5PD6
DB9 male to 5 pin DIN plug, 6 ft long, assembly or molded type



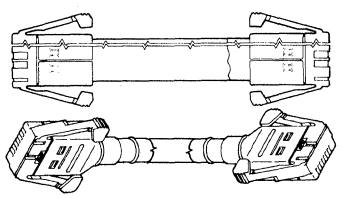
MCA8522
IEEE-488 CABLE
6 ft



5736MM6
36 pin male to male fully loaded, 6 ft
5736MF6
Male to female, 6 ft
5736FF6
female to female, 6 ft

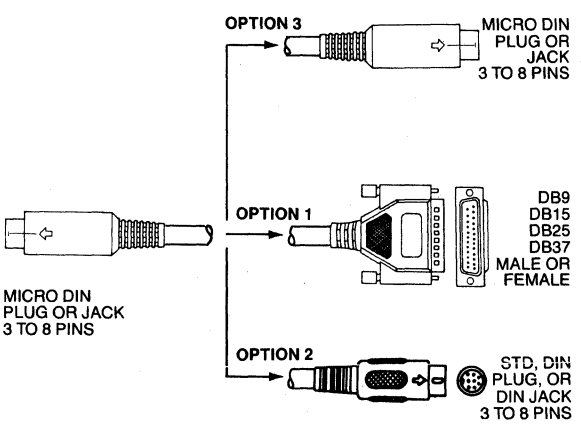


Molded molex connector
Mol-3
3 position, 6 ft
Mol-4
4 position, 6 ft



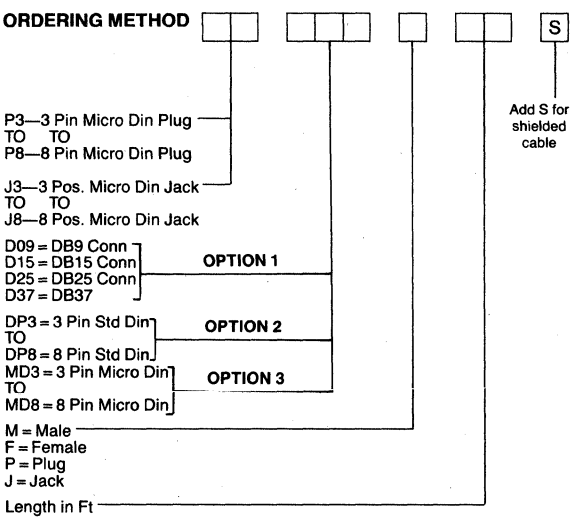
SDL TYPE
4, 6, 8, 16 position
Custom Length
Round or Flat

CUSTOM MADE MOLDED MICRO-DIN CABLE ASSEMBLIES



OTHER COMBINATIONS ARE AVAILABLE UPON REQUEST

ORDERING METHOD



Example: P5D37M12S = 5 Pin Micro Din Plug to DB37 Male Conn. 12 ft., shielded.

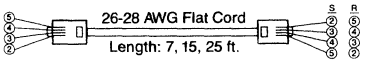
LZRelectronics,inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

MODULAR TELEPHONE CORDS

T4-4 CONDUCTOR SERIES: PLUG TO PLUG

* S = Straight Through Wiring
* R = Reversed Sequence Wiring

6P4C PLUG

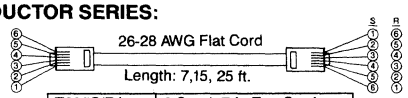


(RJ-11)

T407S/R*	4 Cond. 7 ft. Ext. Cord
T415S/R*	4 Cond. 15 ft. Ext. Cord
T425S/R*	4 Cond. 25 ft. Ext. Cord

T6-6 CONDUCTOR SERIES:

6P6C PLUG

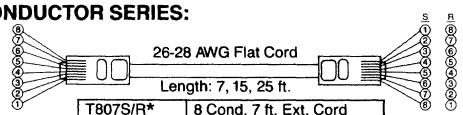


(RJ-11)

T607S/R*	6 Cond. 7 ft. Ext. Cord
T615S/R*	6 Cond. 15 ft. Ext. Cord
T625S/R*	6 Cond. 25 ft. Ext. Cord

T8-8 CONDUCTOR SERIES:

8P8C PLUG

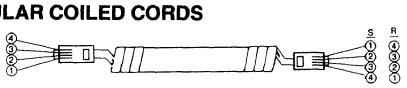


(RJ-45)

T807S/R*	8 Cond. 7 ft. Ext. Cord
T815S/R*	8 Cond. 15 ft. Ext. Cord
T825S/R*	8 Cond. 25 ft. Ext. Cord

C4—MODULAR COILED CORDS

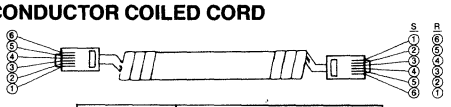
4P4C PLUG



C407S/R*	Telephone Headset Cord 7 ft.
C415S/R*	Telephone Headset Cord 15 ft.
C425S/R*	Telephone Headset Cord 25 ft.

C6—6 CONDUCTOR COILED CORD

6P6C PLUG

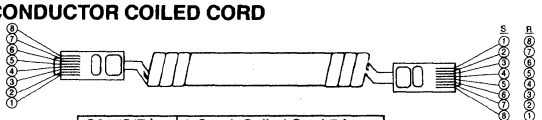


(RJ-11)

C607S/R*	6 Cond. Coiled Cord 7 ft.
C615S/R*	6 Cond. Coiled Cord 15 ft.

C8—8 CONDUCTOR COILED CORD

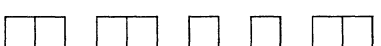
8P8C PLUG



(RJ-45)

C807S/R*	8 Cond. Coiled Cord 7 ft.
C815S/R*	8 Cond. Coiled Cord 15 ft.

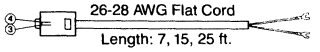
ORDERING METHOD
COILED CORDS



CORD TYPE	LENGTH	WIRING	WIRE TYPE	COLOR
C4-4 Cond.	07 - 7 ft.	S = Straight thru	C = 26-28 AWG Copper Strand	SL - Silver
C6-6 Cond.	15 - 15 ft.	R = Reverse	T = Tinsel	BK - Black
C8-8 Cond.	25 - 25 ft.	Sequence		IV - Ivory

S2-2 CONDUCTOR SERIES: PLUG TO SPADE

6P2C PLUG

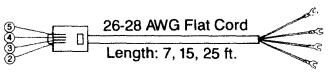


(RJ-11)

S207	2 Cond. 7 ft. Plug to Spade
S215	2 Cond. 15 ft. Plug to Spade
S225	2 Cond. 25 ft. Plug to Spade

S4-4 CONDUCTOR SERIES

6P4C PLUG

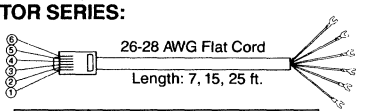


(RJ-11)

S407	4 Cond. 7 ft. Plug to Spade
S415	4 Cond. 15 ft. Plug to Spade
S425	4 Cond. 25 ft. Plug to Spade

S6-6 CONDUCTOR SERIES:

6P6C PLUG

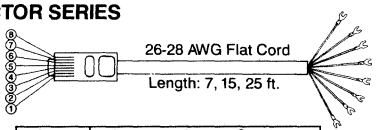


(RJ-11)

S607	6 Cond. 7 ft. Plug to Spade
S615	6 Cond. 15 ft. Plug to Spade
S625	6 Cond. 25 ft. Plug to Spade

S8-8 CONDUCTOR SERIES

8P8C PLUG



(RJ-45)

S807	8 Cond. 7 ft. Plug to Spade
S815	8 Cond. 15 ft. Plug to Spade
S825	8 Cond. 25 ft. Plug to Spade

BULK TELEPHONE CABLE

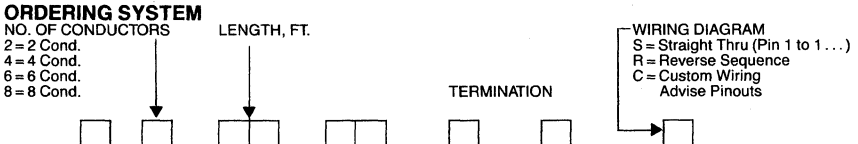
MODEL	DESCRIPTION
TC1K4C	1000 Ft. Reel, Flat Cord, 4C
TC3.5K4C	3,500 Ft. Reel, Flat Cord, 4C
TC5006C	500 Ft. Reel, Flat Cord, 6C
TC1K6C	1000 Ft. Reel, Flat Cord, 6C
TC2.5K6C	2500 Ft. Reel, Flat Cord, 6C
TC5008C	500 Ft. Reel, Flat Cord, 8C
TC1K8C	1000 Ft. Reel, Flat Cord, 8C
TC2K8C	2000 Ft. Reel, Flat Cord, 8C

SHIELDED

MODEL	DESCRIPTION
TS1K31	1000 Ft. Reel, Flat, 3 Cond & Drain
TS1K51	1000 Ft. Reel, Flat, 5 Cond & Drain
TS1K71	1000 Ft. Reel, Flat, 7 Cond & Drain

CUSTOM MADE MODULAR CORD ASSEMBLIES

ORDERING SYSTEM



NO. OF CONDUCTORS
2 = 2 Cond.
4 = 4 Cond.
6 = 6 Cond.
8 = 8 Cond.

LENGTH, FT.

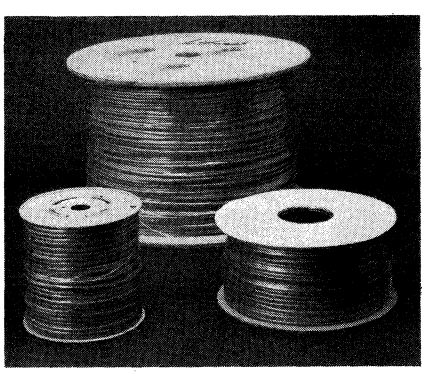
TERMINATION

WIRING DIAGRAM
S = Straight Thru (Pin 1 to 1 . . .)
R = Reverse Sequence
C = Custom Wiring Advise Pinouts

CORD TYPE
A = Flat Cord, Copper Strand
B = Flat Cord, Tinsel Wire
C = Round Cord, 26-28AWG Copper
D = Round Shielded Cord
E = Flat Shielded Cord
F = Coiled Cord Tinsel Wire
G = Coiled Cord, 26-26AWG Copper
H = Coiled Cord, Shielded

COLOR
SL = Silver
BK = Black
WT = White
IV = Ivory
BG = Beige
BR = Brown
CM = Custom Color

LEFT SIDE / RIGHT SIDE
0 = Unterminated
1 = 4P4C Plug
2 = 6P4C Plug
3 = 6P6C Plug
4 = 8P8C Plug
5 = Spade Lugs



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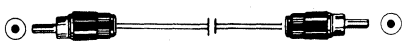
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

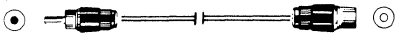
CUSTOM CABLE ASSEMBLIES

ASSEMBLY OR MOLDED TYPE
AUDIO, VIDEO, RCA, DIN, 3.5mm, 6.4mm

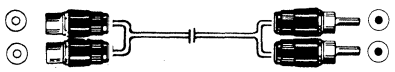
AC 094 Mono
RCA plug double end, 6 ft.



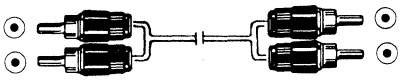
AC 095 Mono
RCA plug to RCA jack, 6 ft.



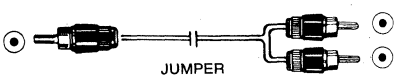
AC 096 Stereo
2 RCA jacks and 2 RCA plugs, 6 ft.



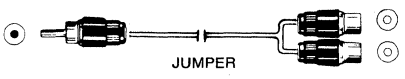
AC 097 Stereo
2 RCA plugs each end, 6 ft.



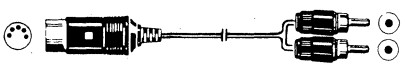
AC 099 Mono
RCA plug to 2 RCA plugs, 1 ft.



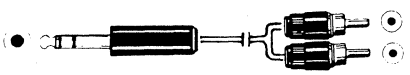
AC 100 Mono
RCA plug to 2 RCA jacks 1 ft.



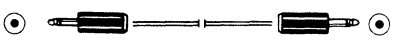
AC 015 Stereo
5 pin DIN plug to 2 RCA plugs, 6 ft.



AC 022 Stereo
¼" phone plug stereo (6.4mm) to 2 RCA plugs, 1 ft.

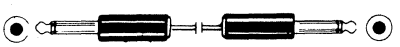


AC 049 Mono
3.5mm plug to plug, 6 ft.



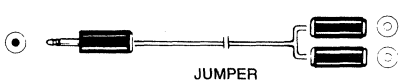
AC049S 3.5mm plug to plug, Stereo, 6 ft.

AC 047 Mono
6.4mm (¼") plug on each end, 6 ft.

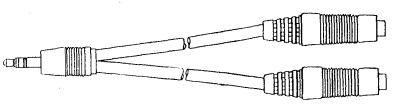


AC047S 6.4mm plug to plug, Stereo, 6 ft.

AC 108 Mono
3.5mm plug to two jacks, 1 ft.

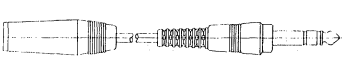


AC 108S Stereo
3.5mm plug to two jacks, stereo, 1 ft.

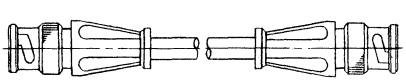


AC 6435 Mono
6.4mm (¼") phone plug to 3.5mm plug, 6 ft.

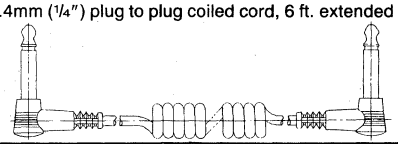
AC 6464 Stereo
6.4mm (¼") phone plug to jack, 6 ft.



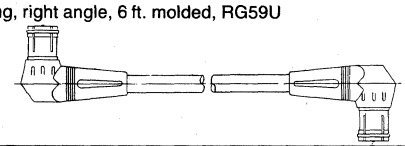
CVC 506
BNC Male to Male, molded, 6 ft. RG59U



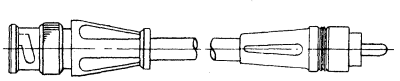
AC 64RAC Mono
Right angle 6.4mm (¼") plug to plug coiled cord, 6 ft. extended length



CVC 510RA Push on
F plug to plug, right angle, 6 ft. molded, RG59U



CVC 509
BNC Male to RCA plug, molded, 6 ft., RG 59U



Notes: A. Some custom molded assemblies require 500 pcs. min. order and 8–10 weeks lead time.
B. Your own specifications are welcome for our quote.

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COAXIAL CABLE ASSEMBLIES

- CUSTOM
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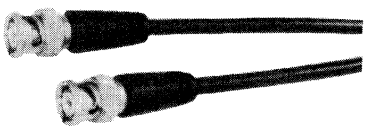
- TNC CONNECTORS
- N CONNECTORS
- RCA CONNECTORS
- MIC CONNECTORS
- TWINAXIAL CONNECTORS
- F CONNECTORS
- UHF CONNECTORS
- DIN CONNECTORS

BNC MALE BOTH ENDS MOLDED TYPE

M2BNC6 6 ft.
M2BNC12 12 ft.
M2BNC24 24 ft.
M2BNC36 36 ft.

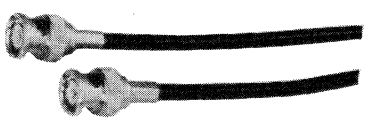


"F" MALE BOTH ENDS MOLDED TYPE

M2F6 6 ft.
M2F12 12 ft.
M2F24 24 ft.
M2F36 36 ft.

BNC MALE BOTH ENDS CRIMP TYPE

C2BNC6 6 ft.
C2BNC12 12 ft.
C2BNC24 24 ft.
C2BNC36 36 ft.

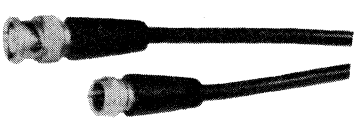


"F" MALE BOTH ENDS CRIMP TYPE

C2F6 6 ft.
C2F12 12 ft.
C2F24 24 ft.
C2F36 36 ft.

BNC MALE TO "F" MALE MOLDED TYPE

MBNCF6 6 ft.
MBNCF12 12 ft.
MBNCF24 24 ft.
MBNCF36 36 ft.



BNC MALE TO RCA PLUG MOLDED TYPE

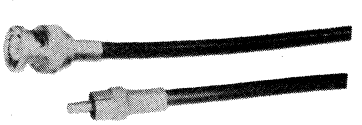
MBNCR6 6 ft.
MBNCR12 12 ft.
MBNCR24 24 ft.
MBNCR36 36 ft.

BNC MALE TO "F" MALE CRIMP TYPE

CBNCF6 6 ft.
CBNCF12 12 ft.
CBNCF24 24 ft.
CBNCF36 36 ft.

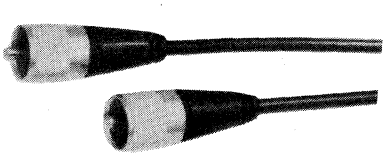
BNC MALE TO RCA PLUG CRIMP TYPE

CBNCR6 6 ft.
CBNCR12 12 ft.
CBNCR24 24 ft.
CBNCR36 36 ft.



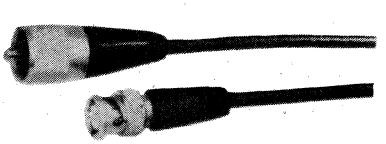
UHF MALE TO UHF MALE MOLDED TYPE

M2UHF6 6 ft.
M2UHF12 12 ft.
M2UHF24 24 ft.
M2UHF36 36 ft.



UHF MALE TO BNC MALE MOLDED TYPE

MBNCU6 6 ft.
MBNCU12 12 ft.
MBNCU24 24 ft.
MBNCU36 36 ft.

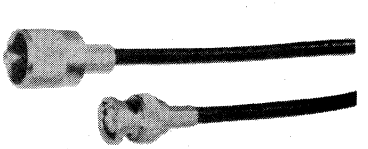


UHF MALE TO UHF MALE CRIMP TYPE

C2UHF6 6 ft.
C2UHF12 12 ft.
C2UHF24 24 ft.
C2UHF36 36 ft.

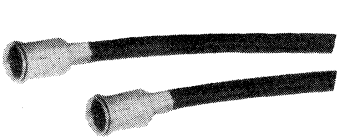
UHF MALE TO BNC MALE CRIMP TYPE

CBNCU6 6 ft.
CBNCU12 12 ft.
CBNCU24 24 ft.
CBNCU36 36 ft.



"F" PUSH-ON MALE BOTH ENDS CRIMP TYPE

C2FP6 6 ft.
C2FP12 12 ft.
C2FP24 24 ft.
C2FP36 36 ft.



UHF MALE TO "F" MALE CRIMP TYPE

CUHFF6 6 ft.
CUHFF12 12 ft.
CUHFF24 24 ft.
CUHFF36 36 ft.

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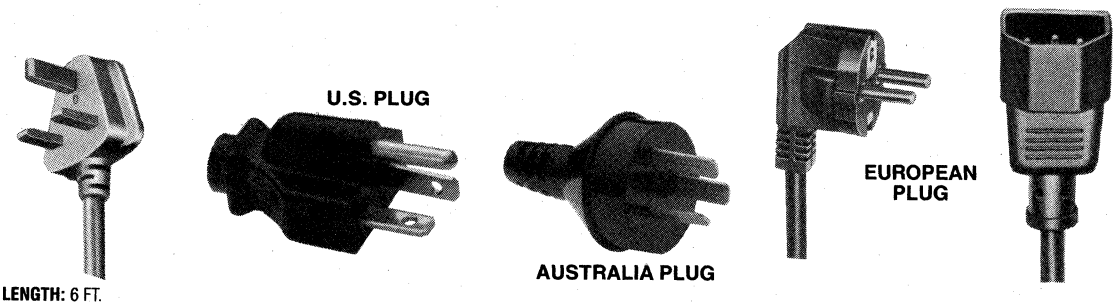
AC POWER CORDS USA AND INTERNATIONAL



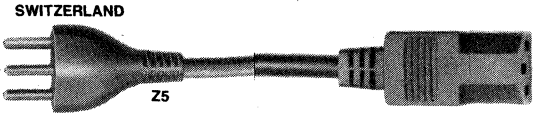
STANDARD LENGTH: 6 FT.

Approval	Model No.	Rating	Size Of Conductor AWG	Size Of Conductor Composition	Cord	Nominal O.D. (mm).	Temperature Rating
TA-3							
UL	Ⓢ ZV01	125V 10A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ01	125V 10A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
TA-5							
UL	Ⓢ ZV02	250V 6A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ02	250V 6A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
VDE	Z302	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z502	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C
TA-3 — TA-5							
UL	Ⓢ ZV03	125V 10A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ03	125V 10A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
TA-3 — TA-11							
UL	Ⓢ ZV04	125V 10A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ04	125V 10A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
TA-5 — TA-10							
UL	Ⓢ ZV05	250V 6A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ05	250V 6A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
VDE	Z305	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z505	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C
TA-11 — TA-10							
UL	Ⓢ ZV06	250V 6A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ06	250V 6A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
VDE	Z306	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z506	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C
TA-10							
UL	Ⓢ ZV07	125V 10A	18	41/0.16	SVT	6.4	60°C, 75°C or 105°C
CSA	Ⓢ ZJ07	125V 10A	18	41/0.16	SJT	8.3	60°C, 75°C or 105°C
TA-6P							
VDE	Z308	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z508	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C
TA-6P — TA-10							
VDE	Z309	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z509	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C
TA-6P — TA-5							
VDE	Z310	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z510	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C
TA-6P — TA-11							
VDE	Z311	250V 6A	(0.75mm²)	42/0.15	H03VV-F	6.5	60°C
	Z511	250V 6A	(0.75mm²)	42/0.15	H05VV-F	6.8	60°C

The mark Ⓢ next to the PN denotes that shielded cord is available when required.
Shielded power supply cords are 100% aluminum-mylar tape shielded.

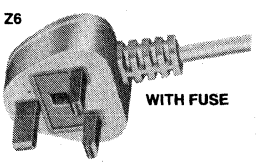
Approval	Model No.	Rating	Size Of Conductor AWG	Size Of Conductor Composition	Type of Cordage	Temperature Rating
POLARIZED OR NONPOLARIZED PLUG TO OPTIONAL SOCKET Z8 (NEMA 1-15P)						
UL CSA	Z1	1250W 10A-125V	18	41/0.16	HPN, SPT-1 SPT-2, 20288	HPN—90°C, 105°C SPT-1—60°C, 105°C
UL CSA	Z2	1625W 13A-125V	16	66/0.16	HPN, SPT-2	SPT-2—60°C, 105°C 20288-105°C
EUROPEAN PLUG TO OPTIONAL SOCKET Z8						
VDE	Z3	625W 2.5A-250V	(0.75mm²)	42/0.15	H03VH-H H03VVH2-F H05VVH2-F	60°
OPTIONAL 2 PRONG — AUSTRALIA PLUG						
	Z4	2500W 10A-250V	(0.75mm²)	24/0.20	Ordinary Duty Circular Flexible Cord	105°C

SWITZERLAND



Z5

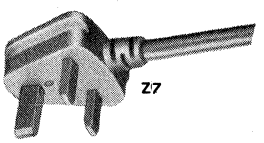
Z6



WITH FUSE

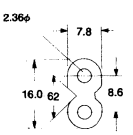
ENGLAND

Z7



ENGLAND

SOCKET Z8



	Z8	1250W 10-A-125V	18	41/0.16	SJT,SPT-1 SJT-2,20288	SJT—60°C, 75°C 105°C
	Z9	1875W 15A-125V	16	66/0.16	SJT,SPT-2	SPT-2—60°C, 105°C 5VT—60°C, 75°C 105°C
TA-10						
	Z10	1250W 10A-250V	18	41/0.16	SJT, SPT-2 SPT-3	SJT—60°C, 75°C 105°C 5VT 60°C, 75°C 105°C

STANDARD LENGTH: 6 FT.

LZR electronics, inc.
8051 Cessna Ave., Gaithersburg, MD 20879
Telephone (301)921-9440 Fax (301)670-0436

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ELECTRIC CABLE CORPORATION

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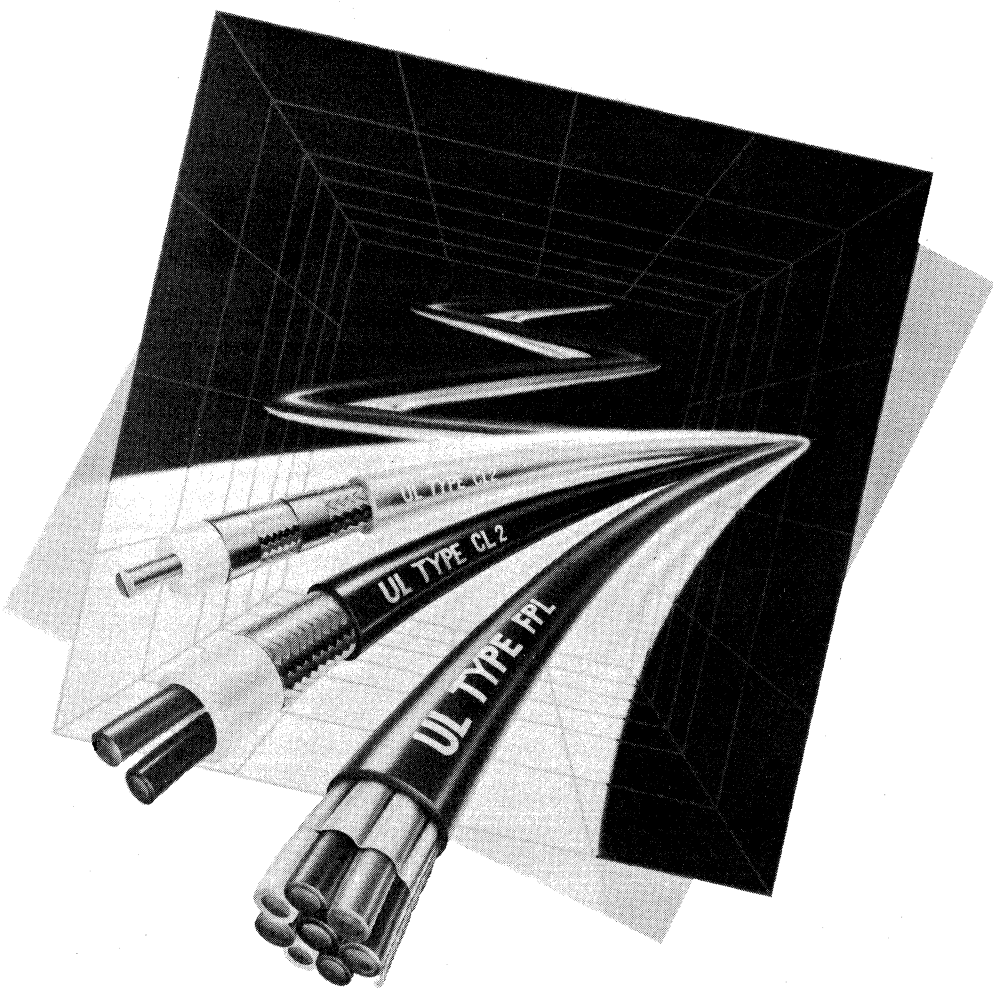
Portable Cords & Power Cables
Power & Building/Wire & Cable
Technical Data



CALL OR WRITE FOR FREE CATALOG

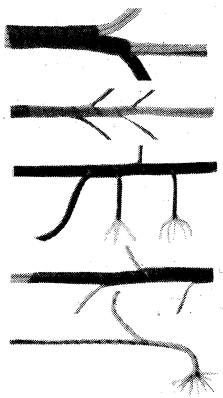
Our new catalog covers 5700 wire, cable and tubing products. It covers the lates technology for data, voice, power, control and instrumentation applications. Includes a cable selector guide and cross-reference index of electronic and thermocouple/instrumentation cable from every major manufacturer.

CALL 800-228-MECC • FAX 914-967-1616
STATION PLAZA, RYE, NEW YORK 10580

Manhattan®
ELECTRIC CABLE CORPORATION

Heli-Tube®

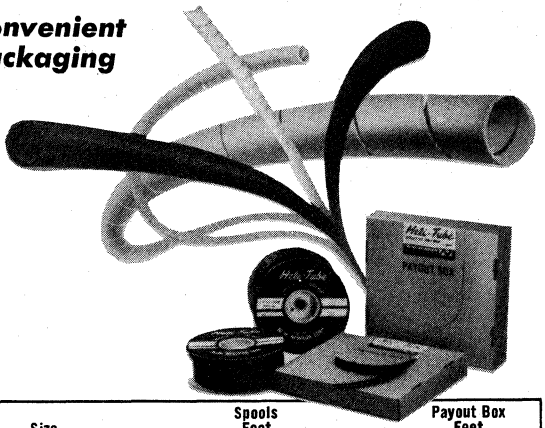
SPIRALLY CUT CABLE WRAP for bundling wires, hoses, and cables.



Exceptional Features and Uses:

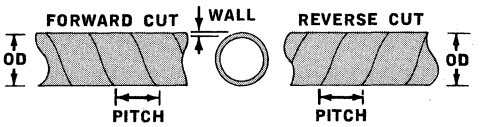
- **Bundles wires, cables or hoses firmly, allowing flexibility.**
- **Organizes messy clusters of wires.**
- **Resists abrasion and protects steel braided hose.**
- **Wire break-outs can be in any orientation.**
- **Colors available for color coding.**

Convenient Packaging



Size	Spools Feet	Payout Box Feet
1/8"	100 or 500	
1/4"	100 or 500	250
3/8"	100 or 500	100
1/2"	100 or 500	50 or 100
3/4"	100 or 200	25 or 50
1"	100	200
Special Packaging Available		

TO ORDER please state size, material and spooling requirement.



Standard Materials	Max. Oper. Temp.	Min. Oper. Temp.	Abrasion Resistance Lower Better mg loss per M cycles	Effect of Solvents	Effect of Acids	Effect of Alkalies	Flammability	Mil Spec. & Approvals
CLEAR POLYETHYLENE Low cost material . . . ideal for general applications. Not affected by ordinary solvents and extremely resistant to abrasion.	215°F 101°C	-105°F -76°C	22	None below 122°F 50°C	None	None	Flammable	Fed. Spec. LP390 MIL I 631D MIL P 26692
BLACK POLYETHYLENE Ultraviolet-resistant for outdoor use. This has the same qualities as Clear Polyethylene and, in addition, contains an ultraviolet absorber which permits it to be used in direct sunlight for long periods of time.	215°F 101°	-105°F -76°C	20	None below 122°F 50°C	None	None	Flammable	Fed. Spec. LP390 MIL I 631 D MIL P 26692
FIRE-RESISTANT POLYETHYLENE SELF EXTINGUISHING, yet has lower cost than Nylon or Teflon. Made of duPont White Rulan. (Also available in Black).	200°F 93°C	-1°F -19°C	27	None below 122°F 50°C	None	None	UL 94V-0	
NYLON Natural - Offers combination of light weight, temperature range, and high abrasion resistance. Self-extinguishing. Recommended for use in enclosed environments where possibility of fire exists. Even at temperatures beyond its operating range, or on exposure to flame, Nylon does not give off any toxic or irritating by-products. Nylon is six times as strong as Polyethylene.	250°F 121°C	-121°F -85°C	6-8	None	Satisfactory except for strong acids	None	UL 94V-2	MIL M-20693A Type I MIL M 22096 LP 410A
BLACK NYLON Has the same characteristics as Nylon Natural, but, in addition, has an ultraviolet absorber which permits use in direct sunlight. This Nylon is heat stabilized.	250°F 121°C	-121°F -85°	6-8	None	Satisfactory except for strong acids	None	UL 94V-2	MIL M-20693A Type II MIL M 22096 LP 410A
TEFLON Natural (TFE) - Has the widest temperature range. Can be used from -450°F to 500°F. Chemically inert. Non-flammable.	500°F 260°C	-450°F -85°C	7	None	None	None	Non-Flammable	MIL M-20693 AMS 3651B AMS 3653 AMS 3654 AMS 3655

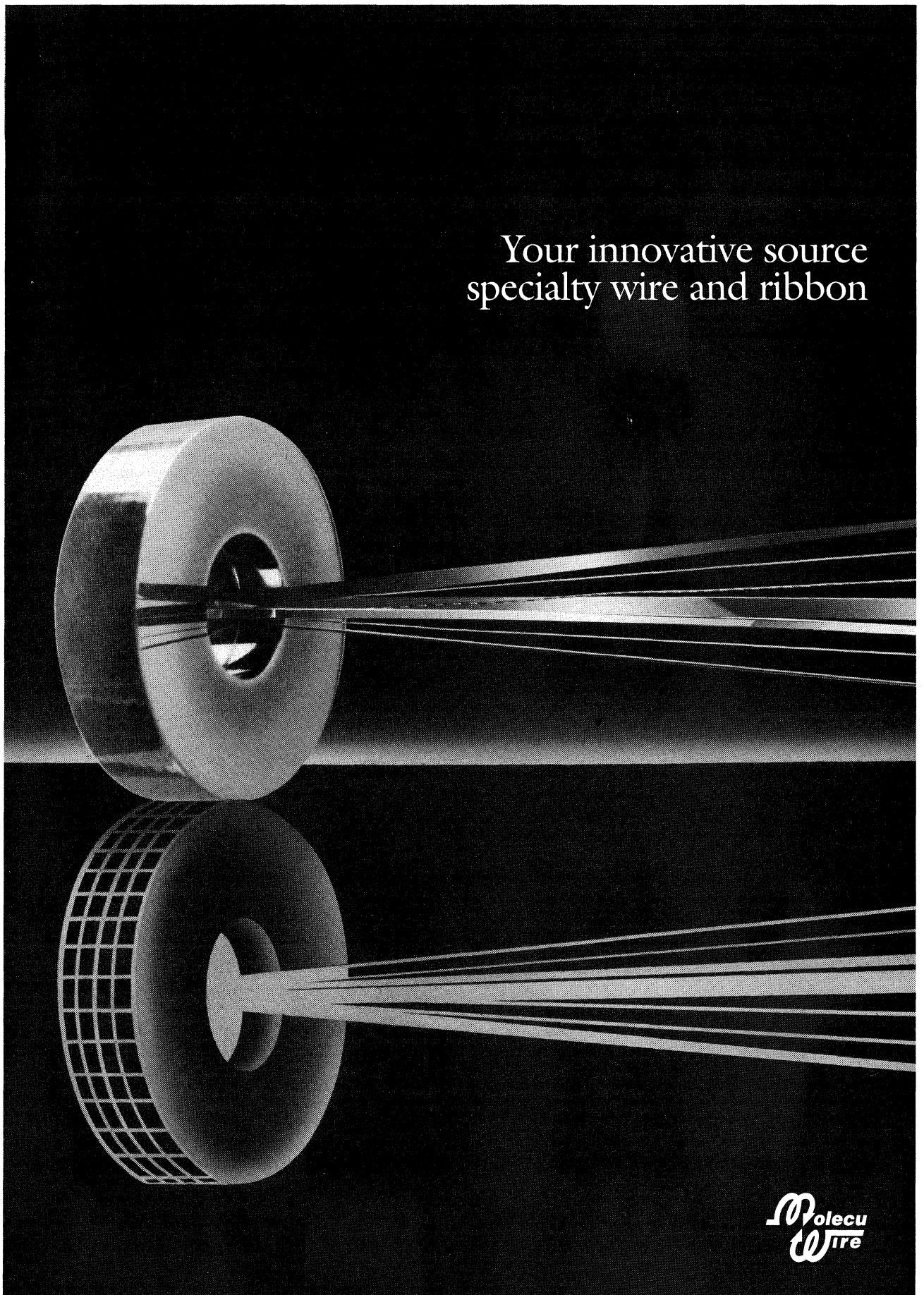
Dimensions & Weights

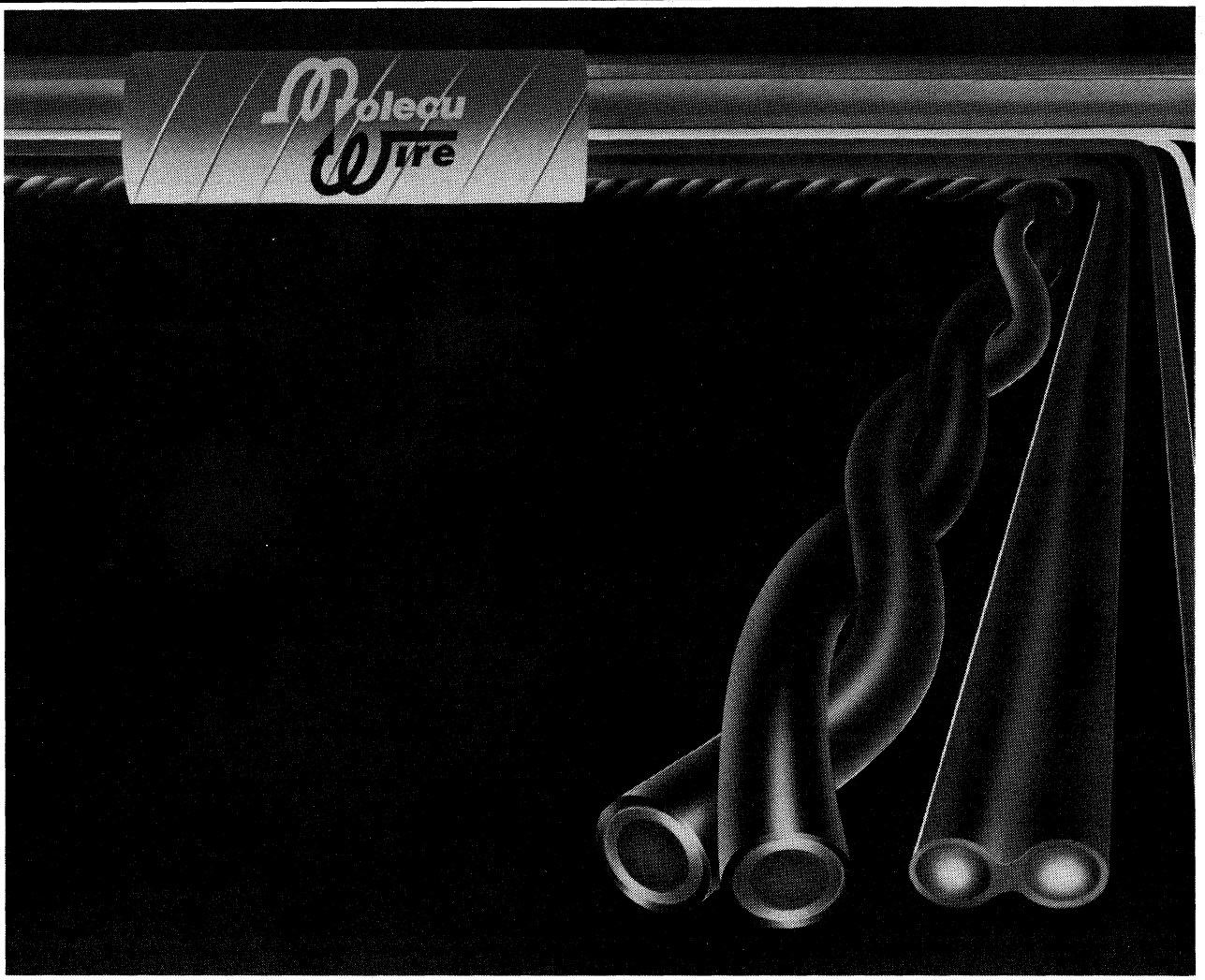
Material	Part No.	Outside Dia.	Wall Thickness	Pitch Decimal	Max. Bundle Range	Weight Lbs./ M Ft.
Clear Polyethylene	HT 1/8C	.125	.032	.187	1/16 to 1/2	4
	HT 1/4C2	.250	.035	.375	3/16 to 2	9
	HT 1/4C	.250	.045	.375	3/16 to 2	12
	HT 3/8C	.375	.052	.438	5/16 to 3	22
	HT 1/2C	.500	.062	.563	3/8 to 4	35
	HT 5/8C	.625	.062	.625	5/8 to 4 1/2	52
	HT 3/4C	.750	.065	.750	3/4 to 5	58
	HT 1C	1.00	.095	1.00	1 to 7	105
Black Polyethylene Ultraviolet-Resistant for Outdoor Use	HT 1/8UR	.125	.032	.187	1/16 to 1/2	4
	HT 1/4UR	.250	.045	.375	3/16 to 2	12
	HT3/8UR	.375	.052	.438	5/16 to 3	22
	HT 1/2UR	.500	.062	.500	3/8 to 4	35
	HT 3/4UR	.750	.065	.750	3/4 to 5	58
	HT 1UR	1.00	.095	1.00	1 to 7	105
Fire-Resistant White Rulan	HT 1/8FR	.125	.032	.187	1/16 to 1/2	6
	HT 1/4FR	.250	.045	.375	3/16 to 2	17
	HT 3/8FR	.375	.052	.438	5/16 to 3	29
	HT 1/2FR	.500	.062	.563	3/8 to 4	52
	HT 3/4FR	.750	.065	.750	3/4 to 5	85
	HT 1FR	1.00	.095	1.00	1 to 7	156
Fire-Resistant Black Rulan	HT 1/4FR-B	.250	.045	.375	3/16 to 2	17
	HT 1/2FR-B	.500	.062	.563	3/8 to 4	52
Nylon	HT 1/8N	.125	.015	.187	1/16 to 1/2	3
	HT 1/4N	.250	.025	.375	3/16 to 2	9
	HT 3/8N	.375	.035	.438	5/16 to 3	18
	HT 1/2N	.500	.035	.500	3/8 to 4	25
	HT 3/4N	.750	.032	.750	1/2 to 5	38
	HT 1N	1.00	.032	1.00	1 to 7	50
Black Nylon Heat Stabilized	HT 1/8N-B	.125	.015	.187	1/16 to 1/2	3
	HT 1/4N-B	.250	.025	.375	3/16 to 2	9
	HT 3/8N-B	.375	.035	.438	5/16 to 3	18
	HT 1/2N-B	.500	.035	.500	3/8 to 4	25
	HT 3/4N-B	.750	.032	.750	1/2 to 5	38
	HT 1N-B	1.00	.032	1.00	1 to 7	50
Teflon	HT 1/8T1	.125	.030	.187	1/16 to 1/2	9.4
	HT 1/8T2	.125	.020	.187	1/16 to 1/2	7.4
	HT 3/16T	.187	.030	.250	1/8 to 1-1/12	15.2
	HT 1/4T	.250	.030	.375	3/16 to 2	20.7
	HT 3/8T	.375	.030	.438	5/16 to 2-1/2	36.5
	HT 1/2T	.500	.030	.500	3/8 to 3	50.5
	HT 3/4T	.750	.032	.750	1/2 to 4	81.3
	HT 1T	1.00	.040	1.00	3/4 to 5	175.0

Heli-Tube is recognized under the component program of Underwriters Laboratories, Inc. Category ZODZ2 File Card E83405(M).

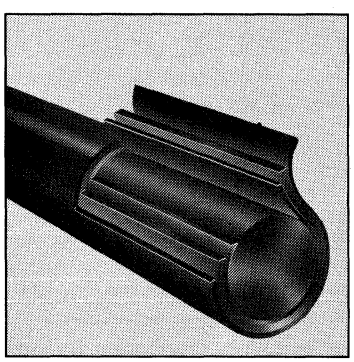
Heli-Tube Division **M. M. NEWMAN CORPORATION**

P.O. BOX 615 • MARBLEHEAD, MA 01945 • (617) 631-7100 • FAX (617) 631-8887


Your innovative source
specialty wire and ribbon
Molecu
Wire



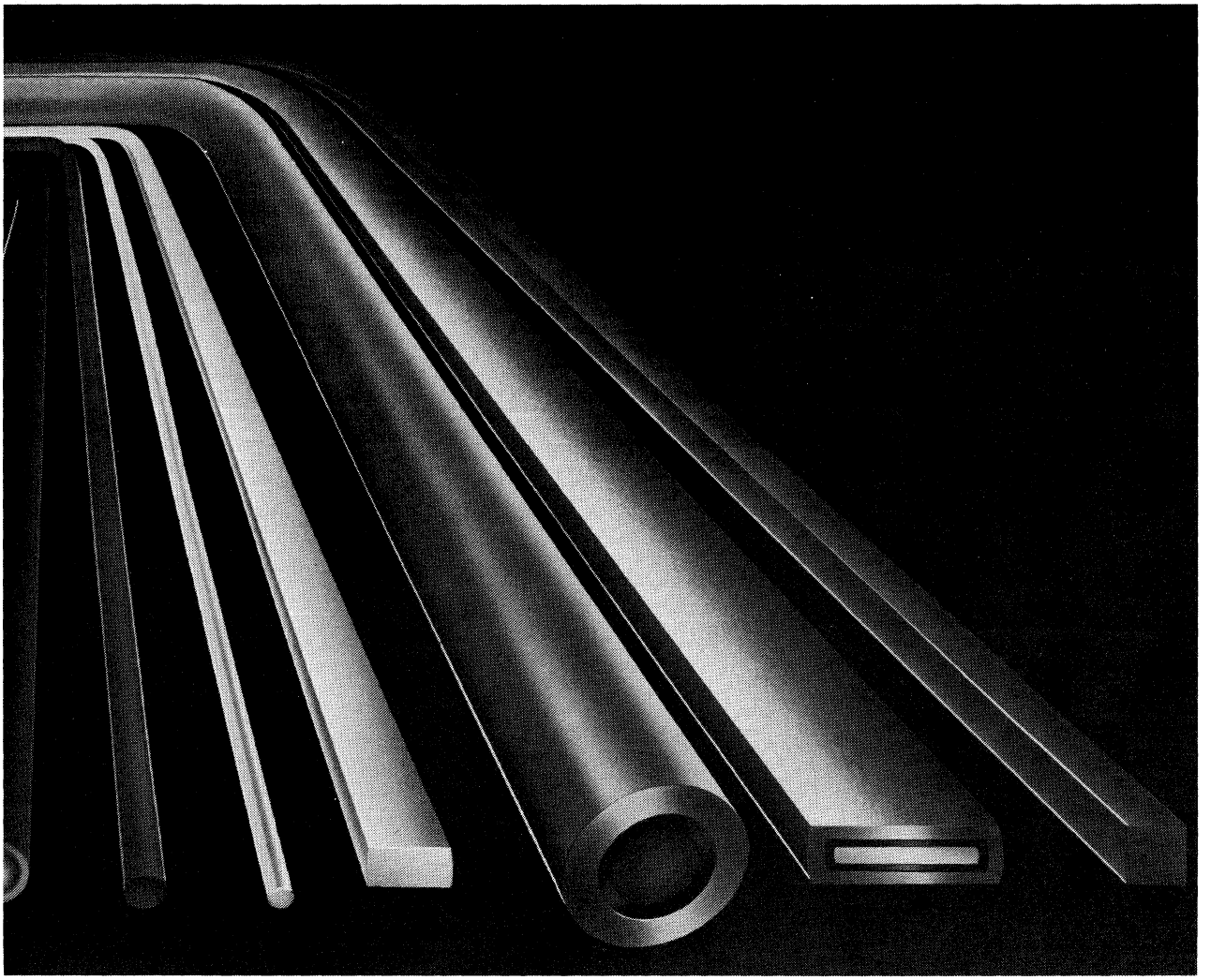
Molecu Wire: Your innovative



When your application calls for "impossible" wire or ribbon, turn to Molecu Wire to insure your project's success.

No matter how tough your process or product parameters—and no matter whether your field is aerospace or data processing . . . medical devices or robotics . . . consumer electronics, telecommunications, appliances or virtually anything else—Molecu's accomplished team of experts can help make your application a reality.

To guarantee the flawless wire or ribbon you need, Molecu's full-service capabilities include metallurgical and application R&D, product engineering, prototyping, complete in-house tool and diemaking, full-scale production with rigorous quality controls including SPC, and some of the most sophisticated testing available anywhere.



source for specialty wire and ribbon

Established in 1958, Molecu is a recognized leader in custom precision wire and ribbon design, engineering and manufacturing. We work with the world's foremost companies—from global giants to small, emerging firms—to pioneer tomorrow's products and technologies . . . today.

To learn more about how you can put Molecu's one-of-a-kind wire and ribbon technology to work for you, call us today at **(201) 938-9473.** Or write Molecu Wire, P. O. Box 495E, Farmingdale, New Jersey 07727. Fax: (201) 938-3189.

Molecu Wire

Wire Size Tolerances

Round Wire[a]

Diameter Range	Standard Tolerance	Premium Tolerance[b]
.0004″–.00095″	±.00005″	±.000025″[c]
.001″–.0049″	±.0001″	±.00005″
.005″–.0109″	±.00015″	±.00005″
.011″–.020″	±.0002″	±.0001″
.0201″–.032″	±.00025″	±.0001″
.0321″–.045″	±.0003″	±.0002″

Ribbon (Flat) Wire[d]

Dimension	Size Range	Standard Tolerance[e]
Width	.003″–.0135″	±.0015″
	.032″–.062″	±.003″
	.0625″–.125″	±.005″
Thickness	.001″–.00495″	±.0005″
	.005″ or thicker	±.001″
Resistance Tolerance	Any thickness or width	±5%

NOTES
a Round wire can be produced to size or resistance tolerance. Consult with our Engineering Department.
b Tighter tolerances are available upon request.
c Based on resistance.
d Ribbon can be processed either to resistance or size tolerances.
e Tighter tolerances are available upon request.

Round Wire Finishes

Diameter Range	Type	Bright	Semi-Matte	Matte
.032″ or smaller[f]	Diamond Drawn	Yes	Yes	Yes
.0325″–.064″	Compax[g] Drawn	Yes	Yes	Yes
.0645″ or larger	Tungsten Carbide Drawn	Yes	Yes	Yes

NOTES
f Compax finish available down to .010″ diameter
g Registered trademark of General Electric Co.

Bright Resistance Wire Standards

Alloy	Resistivity	Alloy	Resistivity
Moleculoy/Moleculoy III	800 ± 5% ohms/CMF	Electroloy	675 ± 5% ohms/CMF
Protoloy	650 ± 5% ohms/CMF	Neutroloy	300 ± 10% ohms/CMF

Temperature Coefficient of Resistance

High Range: +25°C to +125°C Low Range: –55°C to +25°C
Moleculoy: ±20 ppm (Standard), ±3 ppm (Premium)
Neutroloy: ±20 ppm (High and Low). Closer tolerances available.

Resistance: Ohms/foot, Tolerances

Diameter Range	Standard	Premium
Under .002″	±10%	±5%
.002″ to .005″	±8%	±3½%
.005″ or larger	±5%	±2½%

Wire Plating

Standard Platings Available

- Gold
- Silver
- Nickel
- Tin
- Others on request

Enamel Coating

Standard Coatings

Name	Type	Thermal Rating
Isomid®[b]	Polyester-imide	180°C
Himol	Polyimide	250°C
Isonel	Polyester	200°C
Poly/Nylon	Polyurethane Resins and Polyamide Resins	130°C
Polyurethane	Polyurethane Resins	105°C
Formvar	Polyvinyl-formal	105°C

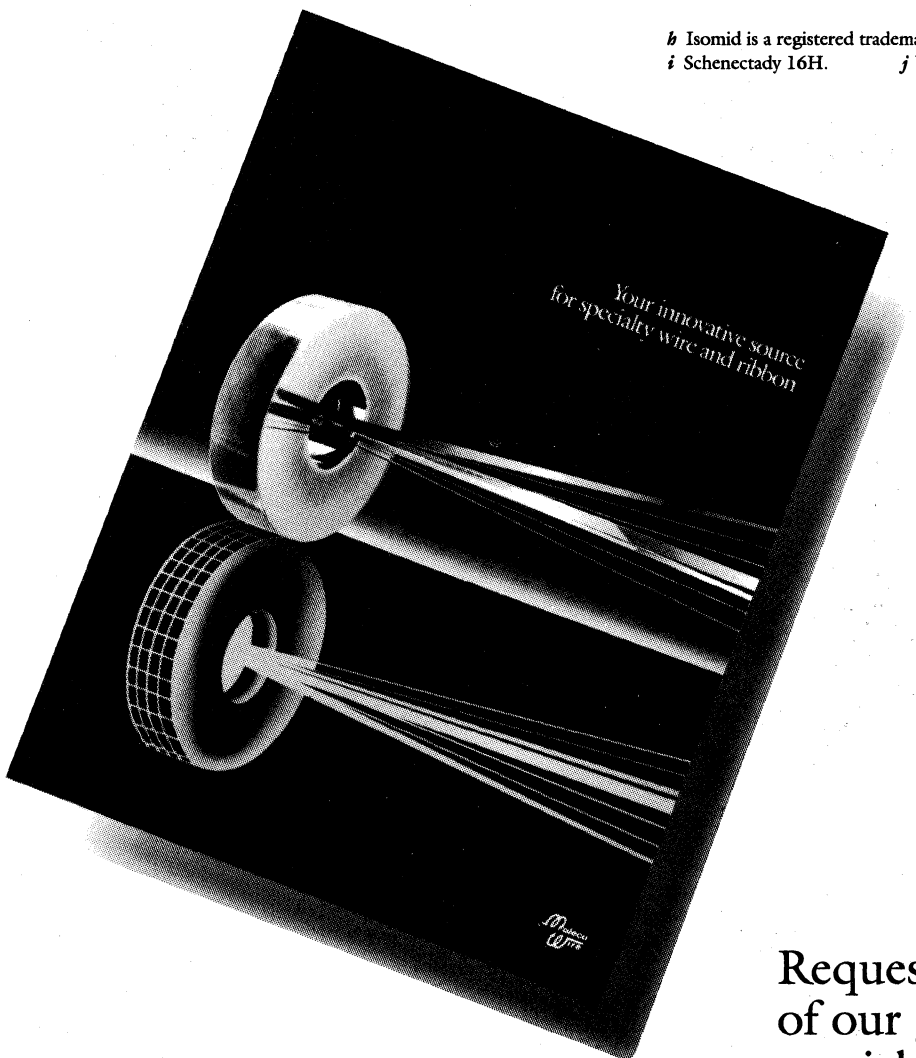
Standard Bondable Overcoats

Bondall[i]	Polyvinyl Butyral	—
VG 8637®[j]	Epoxy Thermoplastic	—

NOTES

b Isomid is a registered trademark of Schenectady Chemical Co.

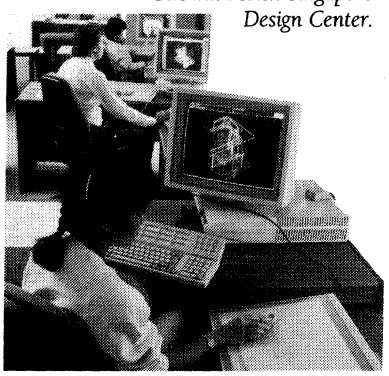
i Schenectady 16H. *j* VG 8637 is a registered trademark of DuPont.



Request a free copy of our guide to specialty wire and ribbon. Call Molecu today at (201) 938-9473.

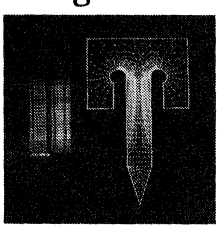
molex

Worldwide Capabilities

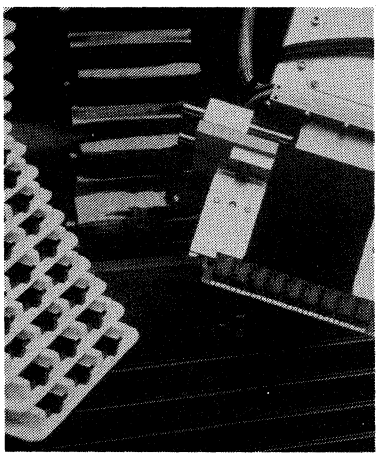


Shown: *Molex Singapore Design Center.*

Design Centers



Molex engineering design centers located in the U.S., Singapore, Japan, Germany, Ireland, U.K., France, Brazil and Korea are connected by a worldwide CAD network. Our use of Finite Element Analysis, a predictive engineering "tool," enables the creation of mathematical prototype and simulated performance.



Shown: *Robotic Delivery System.*

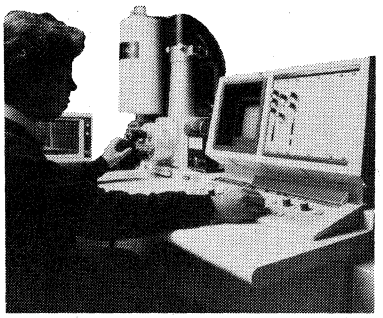
Tooling Support

Application tooling for crimp and insulation displacement termination, and robotic delivery systems, lower your applied costs. Molex is committed to designing and building quality equipment to support your assembly operations — from hand tools for prototypes and repairs, to fully automated, high-volume termination machines.

Manufacturing

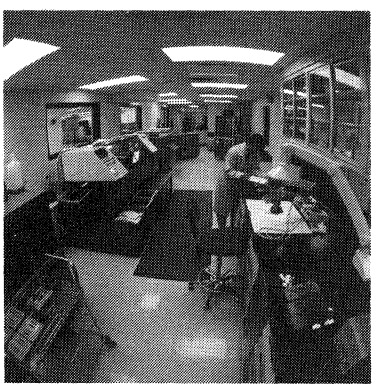
Continuous monitoring of manufacturing systems and processes combined with consistent investments in capital equipment result in improved utilization and the highest quality products.

Shown: *CNC operation allows tooling utilization up to 24 hrs.*



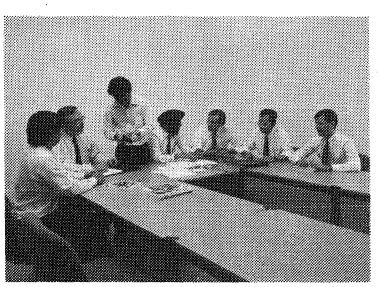
SPC/Quality

Quality at all levels of work at Molex is our #1 priority. To this end, Statistical Process Control training is required of **all** employees; classes are conducted year-round to educate and update.



Reliability Labs

Reliability test labs are located at all manufacturing locations worldwide. The labs' engineering technicians evaluate Molex designs and products, and with the aid of the latest in monitoring equipment, insure long-term dependability. They perform design development and qualification testing as well.

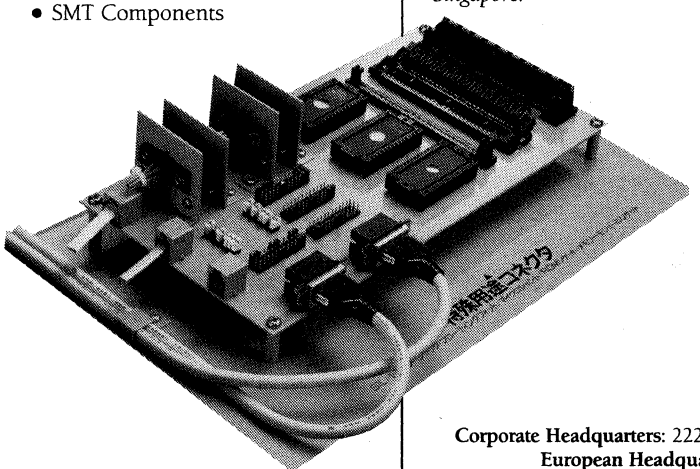


Multi-National Coordination

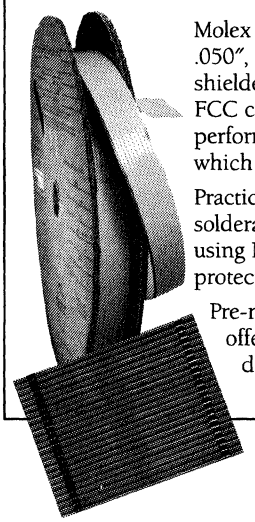
Our special team coordinates the needs of customers who design, purchase and manufacture in different countries.

Products

- Custom Automotive Products
- Overmolded/Insert Molded
- Sealed Connectors
- Dense Packaging Systems
- IDT System
- Cable
- PCB Interconnections
- Sockets
- FCC Connectors
- Fiber Optics
- Telephone Connectors
- Pin and Socket Connectors
- Switches
- Application Tooling
- Solderless Terminals
- I/O Connector Systems
- D-Subminiatures
- SMT Components



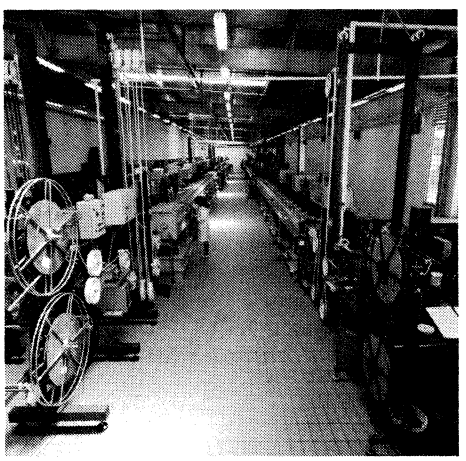
Planar Cable Products



Molex offers a range of round conductor flat cable products on .050″, .100″, .156″, 1.5mm, 2.0mm and 2.5mm centerlines. Foil shielded .050″ cable is available to reduce EMI/FRI and for FCC compliance. High Flex Life Cable with special high performance conductors and Heavy Duty Composite Cable which resists cut/melt-through is offered on .100″ centerlines.

Practical and cost-effective board-to-board or point-to-point solderable interconnects - Cable Jumpers - can be specified using Molex standard flat cables. The strip and retain feature protects the wire leads during shipment and handling.

Pre-notched cable, available on reels of 100 ft. or 300 ft., offers the benefits of in-house termination of insulation displacement connectors without the expense of notching equipment.



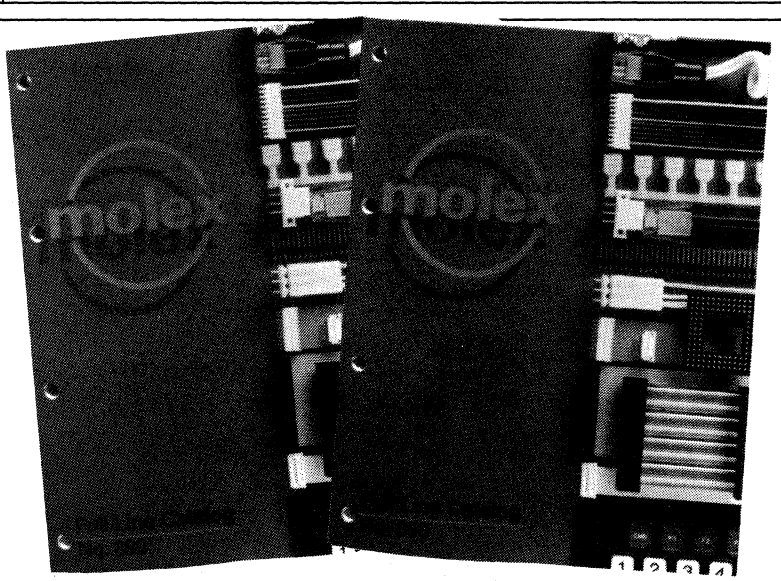
Shown: *Longest plating line in S.E. Asia located at MX Singapore.*

molex

Corporate Headquarters: 2222 Wellington Ct., Lisle, IL 60532 USA, (312)* 969-4550
European Headquarters: Munich, West Germany, 49-89-496093
Northern Asia Headquarters: Tokyo, Japan, 03-487-8333
Southeast Asia Headquarters: Jurong Town, Singapore, 65-660-8555
*After Nov. 11, 1989 - Area Code 708

Our New 1989 Full Line Catalog is Here!

Don't be caught with last year's model! Call or write now for your free copy of the NEW Molex No. 890 Full Line Catalog with 760 pages of interconnection products, switches, and application tooling. The No. 890 Catalog provides design assistance and complete ordering information.



Our goal is to have the wire you need, when you need it. That's why MWS stocks the largest inventory of specialty wires in the country. Over 20,000 types and sizes. If we don't have the wire you need in stock, we'll custom manufacture it. Our short run capabilities provide an alternative to large factory minimums and long deliveries.

MWS
Wire Industries

LARGEST SELECTION OF WIRE PRODUCTS

ALUMINUM
BERYLLIUM COPPER
BRASS
BUS WIRE
COPPER CLAD ALUMINUM
DUMET
EXOTIC ALLOYS
INCONEL
INDIUM
KOVAR
LITZ WIRE
LOCKWIRE/MS20995
MOLYBDENUM
MONEL
MAGNET WIRE
All sizes to 56 AWG Round per – NEMA MW 1000 JW 1177B
High Temperatures, Colors, Half Sizes, Bondable Wires, Copper, Aluminum and Special Conductors
MICROSQUARE™ MAGNET WIRE
Miniature Square and Rectangular smaller than 14 AWG
MULTIFILAR® MAGNET WIRES
2 – 20 Conductor, Parallel Bonded, Color Coded
MUSIC WIRE
NICKEL
NICKEL SILVER
NIOBIUM
OFHC COPPER
PHOSPHOR BRONZE
PLATED WIRE AND RIBBON
Gold, Silver, Tin, Cadmium
PRECIOUS METALS
Gold, Silver, Platinum
RESISTANCE ALLOYS
Nickel-Chrome, Copper-Nickel, Nickel-Iron, Manganin
SPECIAL CABLES
STAINLESS STEEL
SUPERCONDUCTOR
TANTALUM
TITANIUM
TUNGSTEN
TWISTITE™ MAGNET WIRE
24 AWG and Finer
Up to 33 TPI ± 1%
Up to 10 colors in some sizes

FACILITIES/SERVICES

CUSTOM ENAMELING
In our custom enameling facilities we enamel most metals from .072″ to .0004″ round or square and rectangular sizes smaller than 14 AWG or 3500 sq. mil. cross-sectional area. Insulations are available in special colors, builds and bondable overcoats. All insulations meet NEMA MW 1000, 105–220 °C, single thru quadruple film builds. Up to 10 insulation colors are available to aid in conductor identification.

WIRE SHAPING
MWS produces a complete line of miniature square and rectangular wires in a variety of metals. Sizes smaller than 14 AWG sq. and rectangular shapes smaller than 3500 sq. miis. are produced bare as well as film insulated.

RIBBON ROLLING
MWS operates facilities for production of flat ribbon wire in a wide variety of metals. Thicknesses range from .0005″ with widths up to .125″. Ribbon wires are available bare, film insulated and plated.

DRAWING AND ANNEALING
Our drawing and annealing capabilities round out our custom manufacturing facilities. These capabilities allow us to fabricate most metals from .064″ through .0004″ diameter in the temper and quantity you require.

TESTING LABORATORY
Expanded test facility provides complete chemical, physical and electrical test data for applicable military, federal, commercial and customer standards. Metallurgical and I/R spectro analysis are also available. We can provide you with fast and accurate answers to your technical questions.

CUSTOM PACKAGING
MWS has designed custom molded, individual foam shipping containers for our 2½″, 3″, 5″ and 6″ plastic spools. These containers eliminate damage in shipping, and later prevent breakage in storage and production line handling.

WIRE TWISTING
MWS operates facilities for twisting 2 or more conductors 24 AWG and finer. Twisting tightness up to 33 twists per inch and to tolerances of ± 1%. Conductor materials include copper, silver, plated conductors and specialty alloys, in bare and insulated constructions.

WIRE SPOOLING
Spooling facilities handle every size wire from heavy square and rectangular to ultra-fine. This enables you to buy the quantity of wire you need on the spool size you want.

MWS
Wire Industries

31200 Cedar Valley Drive, Westlake Village, CA 91362
CALL TOLL FREE 800 423-5097
In California 800 992-8553. In L.A., 818 991-8553

MICROSQUARE™
MAGNET WIRE

For specialty coil and motor windings.

While product miniaturization allows less space for components, MWS MICROSQUARE film coated magnet wire lets you design compact coils and small motors that deliver more power in less space.

MICROSQUARE means miniature square and rectangular copper and aluminum magnet wire. Custom produced in sizes *smaller* than 14 AWG or 3500 sq. mil. cross-sectional area, MICROSQUARE is available in a wide range of solderable and high-temperature insulations in a variety of colors, with or without bondable overcoats.

MICROSQUARE magnet wire was developed to provide improved winding uniformity and maximum use of space. When you're looking for options to meet the most demanding coil, small motor, or other special application requirements, without size limitations or quantity minimums, take a good look at MICROSQUARE magnet wire.

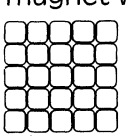


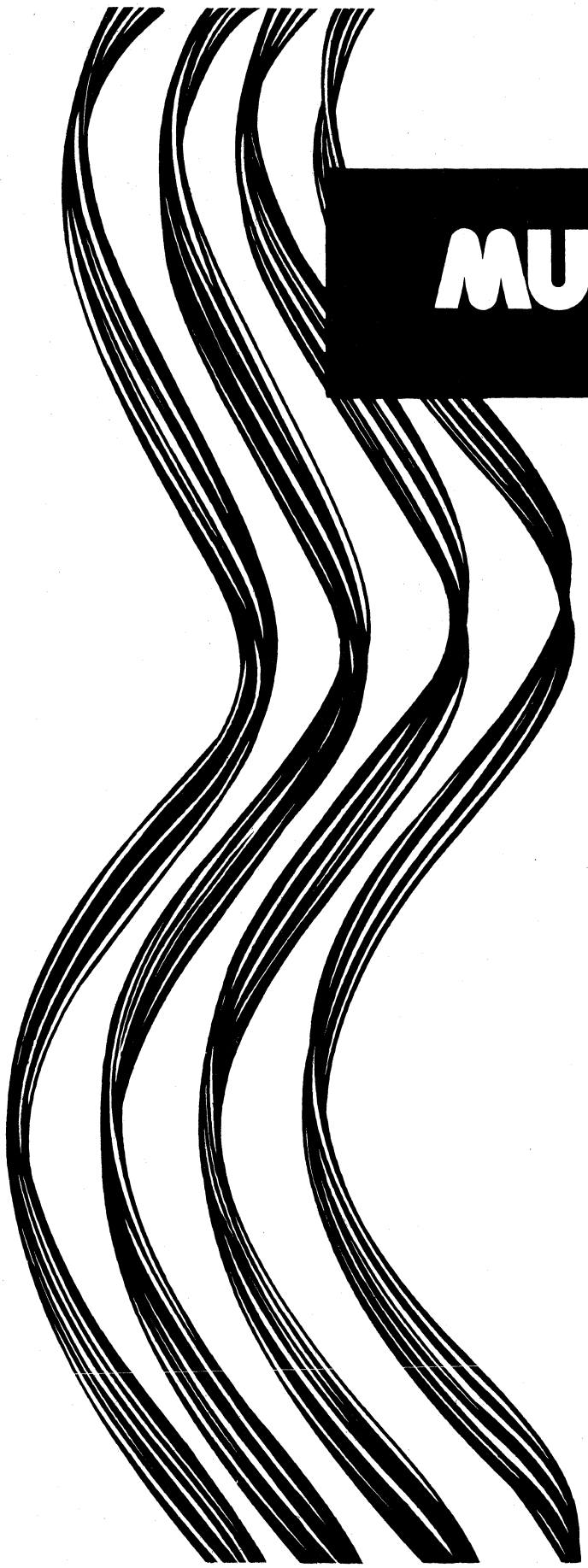
Illustration of cross-section of coil winding using MWS MICROSQUARE magnet wire. Note improved winding uniformity and maximum use of space.

Call or write for your free copy of our Technical Data Booklet and Capabilities Brochure. Both contain valuable information on all wire produced and inventoried by MWS Wire Industries. Samples of MICROSQUARE are available upon request.

MWS
Wire Industries

31200 Cedar Valley Drive, Westlake Village, CA 91362
CALL TOLL FREE 800 423-5097
In California 800 992-8553. In L.A., 818 991-8553

MICROSQUARE is a trademark of MWS Wire Industries



MULTIFILAR
MAGNET WIRE

Parallel bonded for windings and leads.

When two or more magnet wires travel together, MULTIFILAR magnet wire is an excellent alternative.

This parallel bonded, color-coded magnet wire offers more consistent capacitance and impedance characteristics when compared to windings using two or more separate magnet wires.

And, it allows for increased layer winding speeds, as well as reduced labor and handling. Color-coding assists in conductor identification and helps eliminate termination errors.

MULTIFILAR magnet wire is custom produced to guarantee flat, parallel construction in an array of sizes, 16–52 AWG, with up to 20 conductors in some sizes.

Available constructions include round, flat or square conductors. Individual conductors meet NEMA MW 1000, JW 1177, temperature classes 105–220°C; single through quadruple film builds. Color-coded conductors are available in most insulations with up to 10 different colors in some sizes.

Call or write for your free copy of our Technical Data Booklet and Capabilities Brochure. Both contain valuable information on all wire produced and inventoried by MWS Wire Industries. Samples of MULTIFILAR are available upon request.

MWS
Wire Industries
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CALL TOLL FREE 800 423-5097
In California 800 992-8553. In L.A., 818 991-8553

MULTIFILAR® is a registered trademark of MWS Wire Industries

TWISTITE™
MAGNET WIRE

For superior performance and tighter control over twisted wire construction.

Developed for use in the production of custom toroid, ferrite or recording head coils, specialty audio and R.F. transformers, TWISTITE offers a number of distinct advantages.

TWISTITE is custom produced to offer a wider range of twisting construction. Manufacturing capabilities include:

- Up to 33 Twists Per Inch on fine wire.
- Twisting tolerance as tight as ±1%.
- Tightly controlled capacitance, inductance and impedance characteristics.
- Up to 10 colors in some sizes for conductor identification.
- Huge selection of insulations: NEMA MW 1000, JW1177, 105–220°C (single through quadruple film builds).
- Wide range of sizes: 24 AWG and finer.
- Wide variety of conductor materials: copper, silver, plated conductors, and special alloys.

Call or write for your free copy of our Technical Data Booklet and Capabilities Brochure. Both contain valuable information on all wire produced and inventoried by MWS Wire Industries. Samples of TWISTITE are available upon request.

MWS
Wire Industries

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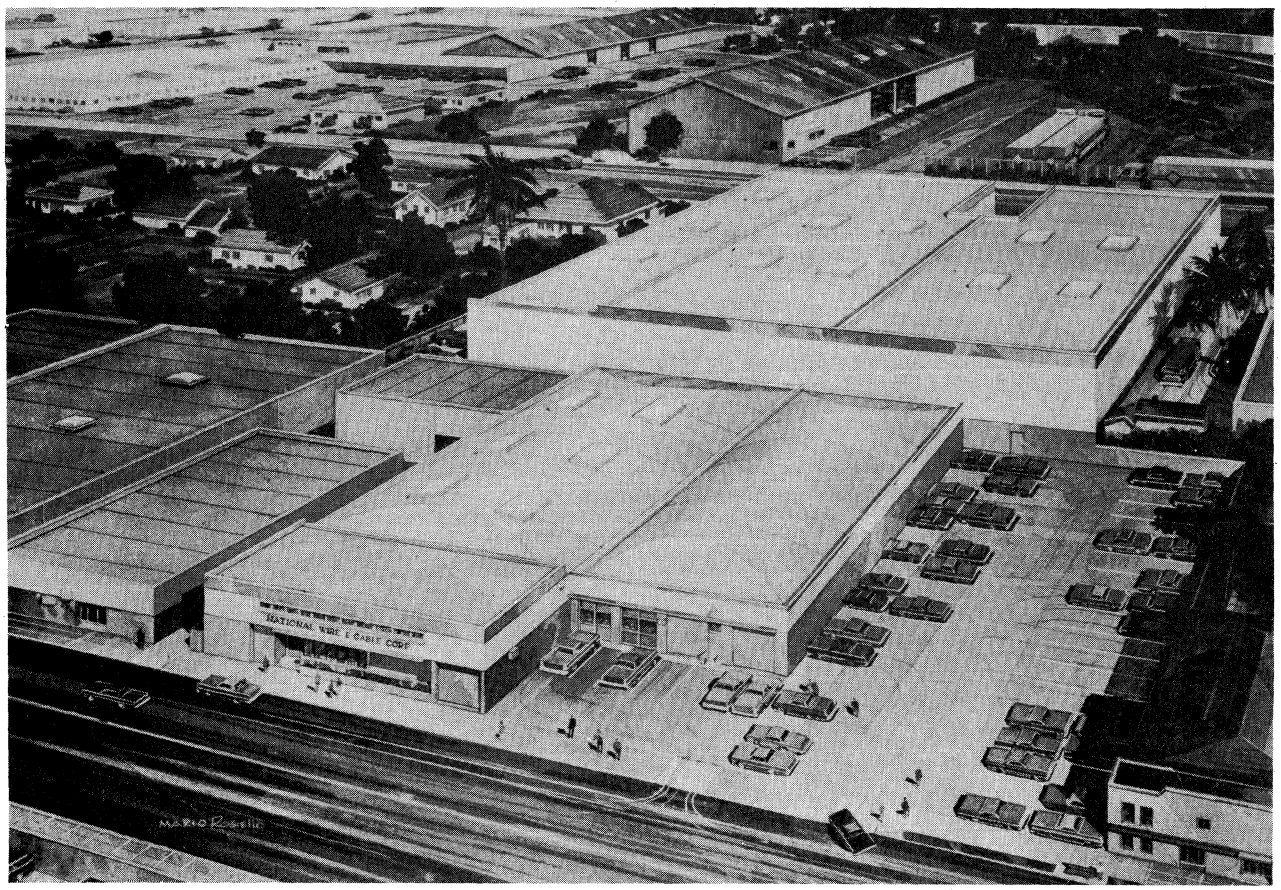
TWISTITE is a trademark of MWS Wire Industries

NATIONAL WIRE AND CABLE CORPORATION

Dept. EM, 136 San Fernando Rd., Los Angeles, CA 90031
Phone: (213) 225-5611, TWX: 910-321-4155, TLX: 181409,
FAX: (213) 225-4630. Fed. Stock Code H4-04569



As a manufacturer of wire and cable products . . . with warehouses on both East and West coasts, National Wire & Cable is ready to fill your immediate needs. Choose from our standard lines of wire or cable . . . OR let us design and custom manufacture exactly what you require for your application.

Our wire inventory is now over 200 million feet, and our 500 different standard multi-conductor cables total in excess of 2.0 million feet!

When you call National Wire, you'll find we are especially well equipped to handle your large as well as minimal requirements. If our "standard" items won't meet your application, we have the wire inventory, the machinery, the expertise to come up with exactly what you need. 180,000 square feet of manufacturing area and our expert engineering staff are at your disposal!!! All cable components are produced within our own facility in order to assure complete quality control.

Review the following catalog pages. If you need some assistance with your specific requirement, call our factory direct, or call our representative nearest you. See Manufacturers and Sales Office Directory Yellow Pages.

NATIONAL WIRE AND CABLE CORPORATION

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FAX: (213) 225-4630. Fed. Stock Code H4-04569

U/L Listed Wire
CSA Listed Wire

- Wires listed by the Underwriter's Laboratories, Inc. for operation in an air or an oil environment. U.L. File #E35793.
- Wires listed by the Canadian Standards Association for radio or electronic uses. CSA File #LR-20482 & LR-32511.

U/L Style 1061

Appliance wiring material available as FR-1 rated 80-degree C Service. .009" semi-rigid vinyl insulation U/L rated: 300-volt service. Meets Mil-W-16878D Type B, and CSA S-R PVC. Also available with solid conductors.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
28	N304-736U	7	36	.015	.034	69.0	1.0
26	N304-1938U	19*	38	.019	.038	42.9	1.5
24	N304-1936U	19*	36	.024	.043	26.8	2.0
22	N304-1934U	19*	34	.030	.050	16.7	3.0
20	N304-1932U	19*	32	.038	.057	10.5	4.75
18	N304-1930U	19	30	.048	.068	6.57	6.5
16	N304-1929U	19	29	.057	.077	4.85	9.0

U/L Style 1007

Appliance wiring available as FR-1 rated 80-degree C Service. 1/64" vinyl insulation U/L rated: 300 volt appliance, use 600 volt electronic use. Meets Mil-W-16878D Type C. Also approved by CSA as Type TR-64 radio wiring for 90-degree C Service. Colors: 10 standard colors plus tracers on solid colors. Also available with solid conductors.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	N303-732U	7	32	.024	.058	26.8	2.75
22	N303-1934U	19*	34	.030	.063	16.7	3.75
20	N303-1932U	19*	32	.038	.072	10.5	5.50
18	N303-1930U	19	30	.048	.082	6.57	8.0
16	N303-1929U	19	29	.057	.090	4.85	10.0

U/L Style 1015

Appliance wiring material available as FR-1 rated 105-degree C Service 1/32" vinyl insulation U/L rated, 2500 volts electronic use, 600 volt appliance use. Meets Mil-W-16878D Type D. Colors: 10 standard colors plus tracers on solid colors.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	N600-732U	7	32	.024	.082	26.8	4.0
22	N600-730U	7	30	.030	.090	16.7	5.2
20	N600-728U	7	28	.038	.098	10.5	7.3
18	N600-1930U	19	30	.048	.108	6.57	10.0
16	N600-1929U	19	29	.057	.117	4.85	12.0
14	N600-1927U	19	27	.071	.130	3.05	17.1
12	N600-1925U	19	25	.090	.162	1.92	27.4
10	N600-4927U	49	27	.111	.181	1.24	38.6

CSA/Type TR-32 Radio Wire

Rated: 90-degree C 600 volt, 1/32" vinyl insulation. Also listed as CSA Appliance Wiring Material 90-degree 600 V. Meets U/L Style 1015 & Mil-W-16878D Type D.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	N307-732U	7	32	.024	.082	26.8	4.0
22	N307-730U	7	30	.030	.090	16.7	5.2
20	N307-728U	7	28	.038	.098	10.5	7.3
18	N307-1930U	19	30	.048	.108	6.57	10.0
16	N307-1929U	19	29	.057	.117	4.85	12.0
14	N307-1927U	19	27	.071	.130	3.05	17.1
12	N307-1925U	19	25	.090	.162	1.92	27.4
10	N307-4927U	49	27	.111	.181	1.24	38.6

*Also available in 7 strands

CSA Listed Type TR-64 Radio Wire

Rated 90-degree C 300 volt, 1/64" vinyl insulation. Meets U/L Style 1007 & Mil-W-16878D Type C.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	N308-732U	7	32	.024	.058	28.4	2.75
22	N308-1934U	19*	34	.030	.063	19.0	3.50
20	N308-1932U	19*	32	.038	.072	13.12	5.25
18	N308-1930U	19	30	.048	.082	7.89	6.75
16	N308-1929U	19	29	.057	.090	4.97	10.0

Also available with Nylon Jacket

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FAX: (213) 225-4630. Fed. Stock Code H4-04569

Military Electronic Hookup Wire

MIL-W-16878/1
Type BU

For internal wiring of electronic equipment.
.010" wall vinyl primary insulation. No outer covering.
—54-degree C to +105-degree C, 600 V, R.M.S. (working). Also available as NABOND. Meets U/L Style 1061, and CSA S-R PVC.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
32	NB740U	7	40	.009	.028	179.0	0.70
30	NB738U	7	38	.012	.031	111.0	0.75
28	NB736U	7	36	.015	.034	69.0	1.0
26	NB1938U	19*	38	.019	.038	42.9	1.5
24	NB1936U	19*	36	.024	.043	26.8	2.0
22	NB1934U	19*	34	.030	.050	16.7	3.0
20	NB1932U	19*	32	.038	.057	10.5	4.5
18	NB1930U	19	30	.048	.068	6.57	6.5
16	NB1929U	19	29	.057	.077	4.85	9.0
14	NB1927U	19	27	.071	.091	3.05	14.0

*Also available in 7 strands

MIL-W-16878/1
Type BN

For internal wiring of electronic equipment.
Vinyl primary insulation with Nylon jacket overall.
—54-degree C to +115-degree C, 600 V, R.M.S. (working). Meets U/L Style 1006.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
32	NB740N	7	40	.009	.032	179.0	0.75
30	NB738N	7	38	.012	.036	111.0	1.0
28	NB736N	19	40	.015	.039	69.0	1.25
26	NB1938N	19*	38	.019	.044	42.9	1.75
24	NB1936N	19*	36	.024	.049	26.8	2.25
22	NB1934N	19*	34	.030	.056	16.7	3.25
20	NB1932N	19*	32	.038	.063	10.5	4.75
18	NB1930N	19	30	.048	.074	6.57	7.0
16	NB1929N	19	29	.057	.083	4.85	9.0
14	NB1927N	19	27	.071	.098	3.05	14.7

*Also available in 7 strands

MIL-W-16878/2
Type CU

For internal wiring of meters, panels & electronic equipment, .015" Wall Vinyl primary insulation (no outer covering).
—54° C to +105° C, 1000 Volts, R.M.S. (working).
Also available as NABOND.
Meets U/L Style 1007 and CSA TR-64.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
26	NC734U	7	34	.019	.053	42.9	2.1
24	NC732U	7	32	.024	.058	26.8	2.75
22	NC1934U	19*	34	.030	.063	16.7	3.75
20	NC1932U	19*	32	.038	.072	10.5	5.50
18	NC1930U	19	30	.048	.082	6.57	8.0
16	NC1929U	19	29	.057	.090	4.85	10.0
14	NC1927U	19	27	.071	.104	3.05	15.0
12	NC1925U	19	25	.090	.124	1.92	24.0

*Also available in 7 strands

MIL-W-16878/3
Type DU

Resists the effect of salt water, aviation fuel, motor oil, ethylene glycol and alcohols (methyl or ethyl).
.031" wall vinyl primary insulation. No outer covering.
—54-degree C to +105-degree, 3000 V, R.M.S. (working). Meets U/L Style 1015 and CSA TR-32.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	ND732U	7	32	.024	.082	26.8	4.0
22	ND730U	7	30	.030	.090	16.7	5.2
20	ND728U	7	28	.038	.098	10.5	7.3
18	ND1930U	19	30	.048	.108	6.57	10.0
16	ND1929U	19	29	.057	.117	4.85	12.0
14	ND1927U	19	27	.071	.130	3.05	17.1
12	ND1925U	19	25	.090	.162	1.92	27.4
10	ND4927U	49	27	.111	.181	1.24	38.6
8	ND13329U	133	29	.167	.246	0.726	70.5
6	ND13327U	133	27	.210	.290	0.444	104.0

*Also available in 7 strands.

NOTE: THE ABOVE WIRES COME IN 10 STANDARD COLORS PLUS TRACERS ON SOLID COLORS.

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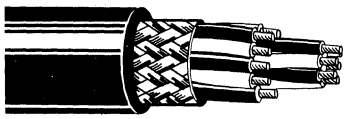
FAX: (213) 225-4630. Fed. Stock Code H4-04569

Miniature Signal & Control Cables Single Conductors (NX Series)



(NX1922SJ shown)

National Wire & Cable Corporation manufactures a complete line of MINIATURE low voltage signal and control cable. Available as cabled pairs or cabled singles, with optional overall shield. Conductors are stranded tinned copper with .010" wall of vinyl primary insulation for use up to 105°C per MIL-W-16878 Type B. Insulated for 600 volts working voltage. (Also meets U.L. AWM Type 1061; 300 volt, 80°C.) All are coded using 10 standard colors plus stripes on white per MIL-STD-681.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape barrier under shields. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078; and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C. vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus resistant. All items are U.L. LISTED STYLE 2343 COMPUTER CABLE; rated 80°C. (Higher temp. ratings apply for any non-U.L. service.)

U.L. and C.S.A. certification furnished only when requested.

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

IN STOCK

MIL-SPEC U.L. LISTED COMPUTER GRADE STYLE 2343

For light duty, gray jacketed version of these cables in the U.L. Style 2464, see NQ Series on following pages.

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage: Greater than 5000 volts AC RMS, 60 cps.

Capacitance: Nominal capacitance from a wire to all else in a cable ranges from 45. to 70. pf/ft. at 1. kc, depending on gauge and position.

Insulation Leakage: 200. megohms/1000 ft. min. @ 500. VDC from any conductor to all else in cable.

Sheath Leakage: 10. megohms/1000 ft. min. @ 500 VDC from shield or conductor group through sheath to ground.

Temperature Range: Suitable for continuous use from −40°C. to +105°C. (U.L. Service limited to +80°C.)

Bending Characteristics: All cables are suitable for flexing to a circle diameter of 6. cable diameters from +105°C. to −20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at −40°C.

MULTICONDUCTOR STOCK CABLED SINGLES

Cond: 22, 24 are 7 strand; 20 AWG is 19 strand

UNSHIELDED							OVERALL SHIELDED							
PART NO.	NO. COND.	COND. AWG	COND. O.D.	JKT. WALL	NOM. O.D.	WEIGHT LB/M'	PART NO.	NO. COND.	COND. AWG	COND. O.D.	JKT. WALL	SHIELD AWG	NOM. O.D.	WEIGHT LB/M'
NX-524 J	5	24	.045	.062	.220	32 Lbs.	NX-524 SJ	5	24	.045	.062	36	.245	44 Lbs.
NX-724 J	7	24	.045	.062	.250	40 Lbs.	NX-724 SJ	7	24	.045	.062	36	.275	55 Lbs.
NX-1224J	12	24	.045	.062	.300	53 Lbs.	NX-1224SJ	12	24	.045	.062	36	.325	68 Lbs.
NX-1524J	15	24	.045	.062	.330	65 Lbs.	NX-1524SJ	15	24	.045	.062	36	.350	80 Lbs.
NX-1924J	19	24	.045	.062	.340	73 Lbs.	NX-1924SJ	19	24	.045	.062	36	.365	88 Lbs.
NX-2724J	27	24	.045	.062	.390	85 Lbs.	NX-2724SJ	27	24	.045	.062	36	.415	102 Lbs.
NX-3724J	37	24	.045	.062	.420	120 Lbs.	NX-3724SJ	37	24	.045	.062	36	.445	140 Lbs.
NX-4824J	48	24	.045	.062	.470	142 Lbs.	NX-4824SJ	48	24	.045	.062	36	.495	172 Lbs.
NX-6024J	60	24	.045	.062	.510	170 Lbs.	NX-6024SJ	60	24	.045	.062	36	.535	205 Lbs.
NX-522 J	5	22	.050	.062	.265	40 Lbs.	NX-522 SJ	5	22	.050	.062	36	.285	50 Lbs.
NX-722 J	7	22	.050	.062	.270	48 Lbs.	NX-722 SJ	7	22	.050	.062	36	.295	58 Lbs.
NX-1222J	12	22	.050	.062	.330	72 Lbs.	NX-1222SJ	12	22	.050	.062	36	.355	87 Lbs.
NX-1522J	15	22	.050	.062	.350	85 Lbs.	NX-1522SJ	15	22	.050	.062	36	.380	101 Lbs.
NX-1922J	19	22	.050	.062	.370	96 Lbs.	NX-1922SJ	19	22	.050	.062	36	.395	111 Lbs.
NX-2722J	27	22	.050	.062	.430	130 Lbs.	NX-2722SJ	27	22	.050	.062	36	.455	150 Lbs.
NX-3722J	37	22	.050	.062	.480	163 Lbs.	NX-3722SJ	37	22	.050	.062	34	.510	193 Lbs.
NX4822J	48	22	.050	.062	.530	210 Lbs.	NX-4822SJ	48	22	.050	.062	34	.560	245 Lbs.
NX-6022J	60	22	.050	.062	.570	255 Lbs.	NX-6022SJ	60	22	.050	.062	34	.600	295 Lbs.
NX-520 J	5	20	.057	.062	.275	49 Lbs.	NX-520 SJ	5	20	.057	.062	36	.300	59 Lbs.
NX-720 J	7	20	.057	.062	.290	59 Lbs.	NX-720 SJ	7	20	.057	.062	36	.315	69 Lbs.
NX-1220J	12	20	.057	.062	.360	90 Lbs.	NX-1220SJ	12	20	.057	.062	36	.385	105 Lbs.
NX-1520J	15	20	.057	.062	.390	110 Lbs.	NX-1520SJ	15	20	.057	.062	36	.415	137 Lbs.
NX-1920J	19	20	.057	.062	.410	128 Lbs.	NX-1920SJ	19	20	.057	.062	36	.435	158 Lbs.
NX-2720J	27	20	.057	.062	.490	166 Lbs.	NX-2720SJ	27	20	.057	.062	36	.515	196 Lbs.
NX-3720J	37	20	.057	.062	.520	220 Lbs.	NX-3720SJ	37	20	.057	.062	34	.550	255 Lbs.
NX-4820J	48	20	.057	.062	.580	275 Lbs.	NX-4820SJ	48	20	.057	.062	34	.610	320 Lbs.
NX-6020J	60	20	.057	.062	.640	335 Lbs.	NX-6020SJ	60	20	.057	.062	34	.670	385 Lbs.

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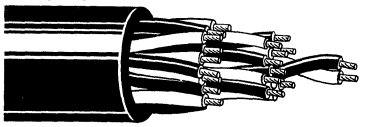
FAX: (213) 225-4630. Fed. Stock Code H4-04569

Miniature Signal & Control Cables Twisted Pairs (NXP Series)



(NXP1924J shown)

IN STOCK MIL-SPEC

U.L. LISTED COMPUTER GRADE STYLE 2343 & 2344

For light duty, gray jacketed version of these cables in the U.L. Style 2464, see NQ Series on following pages.

National Wire & Cable Corporation manufactures a complete line of MINIATURE low voltage signal and control cable. Available as cabled pairs or cabled singles, with optional overall shield. Conductors are stranded tinned copper with .010" wall of vinyl primary insulation for use up to 105°C per MIL-W-16878 Type B. Insulated for 600 volts working voltage. (Also meets U.L. AWM Type 1061; 300 volt, 80°C.) All are coded using 10 standard colors plus stripes on white per table below.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape barrier under shields. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078; and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C. vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus resistant. All items are U.L. LISTED STYLE 2343 COMPUTER CABLE; rated 80°C. (Higher temp. ratings apply for any non-U.L. service.)

U.L. and C.S.A. certification furnished only when requested.

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

* Denotes U.L. Style 2344.

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage: Greater than 5000 volts AC RMS, 60 cps.

Capacitance: Nominal capacitance from a wire to all else in a cable ranges from 45. to 70. pf/ft. at 1. kc, depending on gauge and position.

Insulation Leakage: 200. megohms/1000 ft. min. @ 500. VDC from any conductor to all else in cable.

Sheath Leakage: 10. megohms/1000 ft. min. @ 500 VDC from shield or conductor group through sheath to ground.

Temperature Range: Suitable for continuous use from −40°C. to +105°C. (U.L. Service limited to +80°C.)

Bending Characteristics: All cables are suitable for flexing to a circle diameter of 6. cable diameters from +105°C. to −20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at −40°C.

Impedance: (24. AWG pairs) **Balanced: 87. ohms ±5%** **Unbalanced: 52. ohms ±5%**

MULTI-CONDUCTOR STOCK CABLED PAIRS

Cond: 22, 24 are 7 strand; 20 AWG is 19 strand

UNSHIELDED

PART NO.	NO. PAIRS	COND. AWG	COND. O.D.	JKT. WALL	NOM. O.D.	WEIGHT LB/M′
NXP-524 J	5	24	.045	.062	.330	52 Lbs.
NXP-724 J	7	24	.045	.062	.350	60 Lbs.
NXP-1224J	12	24	.045	.062	.435	90 Lbs.
NXP-1524J	15	24	.045	.062	.485	110 Lbs.
NXP-1924J	19	24	.045	.062	.505	126 Lbs.
NXP-2724J	27	24	.045	.062	.590	167 Lbs.
NXP-3724J	37	24	.045	.062	.660	216 Lbs.
NXP-4824J	48	24	.045	.062	.745	270 Lbs.
NXP-6024J	60	24	.045	.062	.815	325 Lbs.
NXP-522 J	5	22	.050	.062	.365	56 Lbs.
NXP-722 J	7	22	.050	.062	.390	82 Lbs.
NXP-1222J	12	22	.050	.062	.470	120 Lbs.
NXP-1522J	15	22	.050	.062	.545	145 Lbs.
NXP-1922J	19	22	.050	.062	.550	170 Lbs.
NXP-2722J	27	22	.050	.062	.640	230 Lbs.
NXP-3722J	37	22	.050	.062	.750	300 Lbs.
NXP-4822J*	48	22	.050	.080	.850	375 Lbs.
NXP-6022J*	60	22	.050	.080	.930	460 Lbs.
NXP-520 J	5	20	.057	.062	.395	82 Lbs.
NXP-720 J	7	20	.057	.062	.440	108 Lbs.
NXP-1220J	12	20	.057	.062	.540	163 Lbs.
NXP-1520J	15	20	.057	.062	.600	196 Lbs.
NXP-1920J	19	20	.057	.062	.630	235 Lbs.
NXP-2720J	27	20	.057	.062	.745	320 Lbs.
NXP-3720J	37	20	.057	.062	.820	420 Lbs.
NXP-4820J*	48	20	.057	.080	.950	530 Lbs.
NXP-6020J*	60	20	.057	.080	1.040	650 Lbs.

OVERALL SHIELDED

PART NO.	NO. PAIRS	COND. AWG	COND. O.D.	JKT. WALL	SHLD. AWG	NOM. O.D.	WEIGHT LB/M′
NXP-524 SJ	5	24	.045	.062	36	.355	67 Lbs.
NXP-724 SJ	7	24	.045	.062	36	.375	75 Lbs.
NXP-1224SJ	12	24	.045	.062	36	.460	115 Lbs.
NXP-1524SJ	15	24	.045	.062	36	.510	140 Lbs.
NXP-1924SJ	19	24	.045	.062	36	.530	161 Lbs.
NXP-2724SJ	27	24	.045	.062	34	.620	211 Lbs.
NXP-3724SJ	37	24	.045	.062	34	.690	266 Lbs.
NXP-4824SJ	48	24	.045	.062	34	.775	330 Lbs.
NXP-6024SJ*	60	24	.045	.062	34	.845	390 Lbs.
NXP-522 SJ	5	22	.050	.062	36	.390	77 Lbs.
NXP-722 SJ	7	22	.050	.062	36	.415	100 Lbs.
NXP-1222SJ	12	22	.050	.062	36	.495	150 Lbs.
NXP-1522SJ	15	22	.050	.062	34	.575	185 Lbs.
NXP-1922SJ	19	22	.050	.062	34	.580	210 Lbs.
NXP-2722SJ	27	22	.050	.062	34	.670	280 Lbs.
NXP-3722SJ	37	22	.050	.062	34	.780	357 Lbs.
NXP-4822SJ*	48	22	.050	.080	34	.880	445 Lbs.
NXP-6022SJ*	60	22	.050	.080	34	.960	535 Lbs.
NXP-520 SJ	5	20	.057	.062	36	.420	102 Lbs.
NXP-720 SJ	7	20	.057	.062	36	.465	123 Lbs.
NXP-1220SJ	12	20	.057	.062	34	.570	203 Lbs.
NXP-1520SJ	15	20	.057	.062	34	.630	241 Lbs.
NXP-1920SJ	19	20	.057	.062	34	.660	280 Lbs.
NXP-2720SJ	27	20	.057	.062	34	.775	380 Lbs.
NXP-3720SJ*	37	20	.057	.080	34	.850	490 Lbs.
NXP-4820SJ*	48	20	.057	.080	34	.980	605 Lbs.
NXP-6020SJ*	60	20	.057	.080	34	1.070	735 Lbs.

COLOR CODING USED IN TWISTED PAIRS

PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS
1	White with Black	11	Black with Red	21	Brown with Green	31	Orange with Yellow	41	Green with Violet	51	Wht/Blk with Green
2	White with Brown	12	Black with Orange	22	Brown with Blue	32	Orange with Green	42	Green with Gray	52	Wht/Blk with Blue
3	White with Red	13	Black with Yellow	23	Brown with Violet	33	Orange with Blue	43	Blue with Violet	53	Wht/Blk with Violet
4	White with Orange	14	Black with Green	24	Brown with Gray	34	Orange with Violet	44	Blue with Grey	54	Wht/Ik with Gray
5	White with Yellow	15	Black with Blue	25	Red with Orange	35	Orange with Gray	45	Violet with Gray	55	Wht/Brn with Black
6	White with Green	16	Black with Violet	26	Red with Yellow	36	Yellow with Green	46	Wht/Blk with Black	56	Wht/Brn with Brown
7	White with Blue	17	Black with Gray	27	Red with Green	37	Yellow with Blue	47	Wht/Blk with Brown	57	Wht/Brn with Red
8	White with Violet	18	Brown with Red	28	Red with Blue	38	Yellow with Violet	48	Wht/Blk with Red	58	Wht/Brn with Orange
9	White with Gray	19	Brown with Orange	29	Red with Violet	39	Yellow with Gray	49	Wht/Blk with Orange	59	Wht/Brn with Yellow
10	Black with Brown	20	Brown with Yellow	30	Red with Gray	40	Green with Blue	50	Wht/Blk with Yellow	60	Wht/Brn with Green

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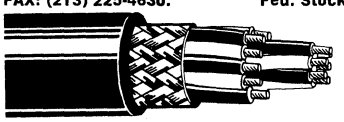
Dept. EM, 136 San Fernando Rd., Los Angeles, CA 90031
Phone: (213) 225-5611, TWX: 910-321-4155, TLX: 181409,
FAX: (213) 225-4630. Fed. Stock Code H4-04569

Heavy Duty Signal & Control Cables Single Conductors (NW Series)



(NW1918SJ shown)

IN STOCK

MIL-SPEC U.L. LISTED — STYLE 2343 & 2344

National Wire & Cable Corporation manufactures a complete line of multiple conductor control cable. Conductors are stranded tinned copper with ¼" wall of vinyl primary insulation for use up to 105°C per MIL-W-16878 Type C.* Insulated for 1000 volts working voltage. Color coded using 10 standard colors plus stripes on white per MIL-STD-681.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape serve over cable bundle. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078, and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C vinyl meeting MIL-I-631 Class F. All materials are self-extinguishing and fungus resistant. All cables are U. L. LISTED STYLE 2343; rated 80°C. (Higher temp. ratings apply to any non-U.L. service.) U.L. certification furnished only when requested.

Standard Putups: 100, 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

For applications in extreme environments, consult factory for alternative sheath materials.

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage: Greater than 8000 volts AC RMS, 60 cps.

U.L. Voltage Rating: 300 volts RMS AC (appliance use).
600 volts RMS AC (electronic use).

Military Voltage Rating: 1000 volts RMS.

Capacitance: Nominal capacitance from a wire to all else in the cable ranges from 40 to 65 mmfd per ft., @ 1000 cps; dependent on gauge and position.

Insulation Leakage Res.: 200. megohms/1000 ft. min. at 500 VDC from any conductor to all else in cable.

Sheath Leakage Res.: 10. megohms/1000 ft. min. at 500 VDC from overall shield through sheath to outside world.

Usable Temp. Range: Suitable for continuous use from +105°C to −55°C.

Cold Bending Capability: All cables are suitable for flexing to a circle diam. of approx. 6 cable diameters from +105°C to −20°C; Recommended flex diameter should be greater than 20 cable diam. for flexing at −40°C. For continuous flexing applications consult factory.

* Insulated wires also meet U.L. style 1007 and CSA type TR-64.
† Denotes U.L. Style 2344.

Conductor sizes 22, 20, 18, 16, 14 & 12 gauge. 22 AWG is 7 strand. All others 19 strand.

UNSHIELDED						OVERALL SHIELDED						
PART NO.	NO. COND.	COND. AWG	JKT. THICK	NOM. O.D.	WEIGHT PER M'	PART NO.	NO. COND	COND AWG	T.C. SHIELD	JKT. THICK	NOM. O.D.	WEIGHT PER M'
NW-722 J	7	22	.060	.315	40 Lbs.	NW-722 SJ	7	22	No. 36	.060	.340	55 Lbs.
NW-1222J	12	22	.060	.385	70 Lbs.	NW-1222SJ	12	22	No. 34	.060	.410	90 Lbs.
NW-1922J	19	22	.060	.440	110 Lbs.	NW-1922SJ	19	22	No. 34	.060	.465	145 Lbs.
NW-2722J	27	22	.060	.510	160 Lbs.	NW-2722SJ	27	22	No. 34	.060	.535	200 Lbs.
NW-3722J	37	22	.060	.565	200 Lbs.	NW-3722SJ	37	22	No. 34	.060	.590	245 Lbs.
NW-4822J	48	22	.060	.635	245 Lbs.	NW-4822SJ	48	22	No. 34	.060	.660	300 Lbs.
NW-6022J	60	22	.060	.695	300 Lbs.	NW-6022SJ	60	22	No. 34	.060	.720	355 Lbs.
NW-7222J	72	22	.060	.755	360 Lbs.	NW-7222SJ	72	22	No. 34	.060	.780	425 Lbs.
NW-8822J	88	22	.060	.820	425 Lbs.	NW-8822SJ	88	22	No. 34	.080	.895†	500 Lbs.
NW-10222J	102	22	.080	.920†	485 Lbs.	NW-10222SJ	102	22	No. 34	.080	.945†	560 Lbs.
NW-720 J	7	20	.060	.340	50 Lbs.	NW-720 SJ	7	20	No. 34	.060	.365	68 Lbs.
NW-1220J	12	20	.060	.420	105 Lbs.	NW-1220SJ	12	20	No. 34	.060	.445	125 Lbs.
NW-1920J	19	20	.060	.485	160 Lbs.	NW-1920SJ	19	20	No. 34	.060	.510	195 Lbs.
NW-2720J	27	20	.060	.565	210 Lbs.	NW-2720SJ	27	20	No. 34	.060	.590	250 Lbs.
NW-3720J	37	20	.060	.630	280 Lbs.	NW-3720SJ	37	20	No. 34	.060	.655	325 Lbs.
NW-4820J	48	20	.060	.710	360 Lbs.	NW-4820SJ	48	20	No. 34	.060	.735	415 Lbs.
NW-6020J	60	20	.060	.775	435 Lbs.	NW-6020SJ	60	20	No. 34	.060	.800	500 Lbs.
NW-7220J	72	20	.080	.885†	485 Lbs.	NW-7220SJ	72	20	No. 34	.080	.910†	555 Lbs.
NW-8820J	88	20	.080	.960†	580 Lbs.	NW-8820SJ	88	20	No. 34	.080	1.035†	660 Lbs.
NW-10220J	102	20	.080	1.030†	670 Lbs.	NW-10220SJ	102	20	No. 34	.080	1.055†	750 Lbs.
NW-718 J	7	18	.060	.370	75 Lbs.	NW-718 SJ	7	18	No. 34	.060	.395	95 Lbs.
NW-1218J	12	18	.060	.460	135 Lbs.	NW-1218SJ	12	18	No. 34	.060	.485	170 Lbs.
NW-1918J	19	18	.060	.535	225 Lbs.	NW-1918SJ	19	18	No. 34	.060	.560	265 Lbs.
NW-2718J	27	18	.060	.625	300 Lbs.	NW-2718SJ	27	18	No. 34	.060	.650	350 Lbs.
NW-3718J	37	18	.060	.700	390 Lbs.	NW-3718SJ	37	18	No. 34	.060	.725	445 Lbs.
NW-4818J	48	18	.060	.790	510 Lbs.	NW-4818SJ	48	18	No. 34	.060	.815	575 Lbs.
NW-6018J	60	18	.080	.905†	600 Lbs.	NW-6018SJ	60	18	No. 34	.080	.930†	680 Lbs.
NW-7218J	72	18	.080	.985†	720 Lbs.	NW-7218SJ	72	18	No. 34	.080	1.010†	820 Lbs.
NW-716 J	7	16	.060	.395	95 Lbs.	NW-716 SJ	7	16	No. 34	.060	.420	125 Lbs.
NW-1216J	12	16	.060	.495	155 Lbs.	NW-1216SJ	12	16	No. 34	.060	.520	195 Lbs.
NW-1916J	19	16	.060	.575	230 Lbs.	NW-1916SJ	19	16	No. 34	.060	.600	275 Lbs.
NW-2716J	27	16	.060	.615	320 Lbs.	NW-2716SJ	27	16	No. 34	.060	.640	375 Lbs.
NW-3716J	37	16	.060	.755	430 Lbs.	NW-3716SJ	37	16	No. 34	.060	.780	500 Lbs.
NW-4816J	48	16	.080	.895†	625 Lbs.	NW-4816SJ	48	16	No. 34	.080	.920†	700 Lbs.
NW-6016J	60	16	.080	.975†	750 Lbs.	NW-6016SJ	60	16	No. 34	.080	1.000†	830 Lbs.
NW-714 J **	7	14	.060	.435	150 Lbs.	NW-714 SJ	7	14	No. 34	.060	.465	180 Lbs.
NW-1214J **	12	14	.060	.555	240 Lbs.	NW-1214SJ	12	14	No. 34	.060	.580	280 Lbs.
NW-1914J **	19	14	.060	.645	370 Lbs.	NW-1914SJ	19	14	No. 34	.060	.670	420 Lbs.
NW-2714J **	27	14	.060	.760	515 Lbs.	NW-2714SJ	27	14	No. 34	.060	.785	575 Lbs.
NW-512 J **	5	12	.060	.460	175 Lbs.	NW-512 SJ	5	12	No. 34	.060	.485	210 Lbs.
NW-712 J **	7	12	.060	.500	225 Lbs.	NW-712 SJ	7	12	No. 34	.060	.525	265 Lbs.
NW-1212J **	12	12	.060	.680	375 Lbs.	NW-1212SJ	12	12	No. 34	.060	.705	430 Lbs.
NW-1912J **	19	12	.060	.745	560 Lbs.	NW-1912SJ	19	12	No. 34	.060	.770	625 Lbs.

**Not listed under UL styles 2343 or 2344 in these gauges.

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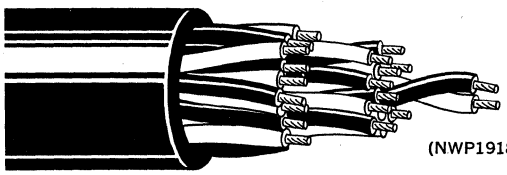
Heavy Duty Signal & Control Cables Twisted Pairs (NWP Series)



(NWP1918J shown)

IN STOCK MIL-SPEC

U.L. LISTED

Identical to National's NW-Series Cables except offered as twisted pairs.

National Wire & Cable Corporation manufactures a complete line of multiple pair control cables. Conductors are of tinned copper strand with 1/64" vinyl primary insulation for use up to 105°C per MIL-W-16878D Type C. Insulated for **1000** volts working voltage. Conductors are color coded using 10 standard basic colors, plus spiral tracers on white per table below.

All pairs are planetary cabled and contra-helically laid with a Mylar tape serve over the cable bundle. The overall jacket is a 105°C black vinyl plastic per MIL-I-631; or may be Neoprene to MIL-R-6855 Class 2 Grade 60 specification. (Neoprene at added cost and only available for non-U.L. applications).

SHIELDED CABLES

National Multiple Conductor SHIELDED CABLES are to the same specifications as above with addition of tinned copper braided shield over cable complex with 85-90% coverage to MIL-C-7078A.

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage:	Greater than 8,000 volts AC RMS, 60 cps.
Capacitance:	Nominal capacitance wire to wire for a pair ranges from 27. to 40. mmfd/ft. Capacitance from both wires tied together measured to all else in common ranges from 35. to 60. mmfd/ft. dependent on gauge and position. Overall shield has negligible effect on W-W capacitance.
Insulation Leakage Res.:	200. megohms / 1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10. megohms / 1000 ft. min. at 500 VDC from overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from +105°C to −55°C.
Cold Bending Capability:	All cables are suitable for flexing to a circle diam. of approx. 6 cable diameters from +105°C to −20°C; Recommended flex diameter should be greater than 20 cable diam. for flexing at −40°C. For continuous flexing applications consult factory.

UNSHIELDED OVERALL						OVERALL SHIELDED					
PART NO.	NO. OF PAIRS	COND. GA.	JKT. THICK	NOM. O.D.	WEIGHT	PART NO.	NO. OF PAIRS	COND. GA.	JKT. THICK	NOM. O.D.	WEIGHT
NWP-722 J	7	22	.045	.470	90 Lbs.	NWP-722 SJ	7	22	.045	.495	135 Lbs.
NWP-1222J	12	22	.050	.600	150 Lbs.	NWP-1222SJ	12	22	.050	.630	206 Lbs.
NWP-1922J	19	22	.050	.700	200 Lbs.	NWP-1922SJ	19	22	.050	.730	260 Lbs.
NWP-2722J	27	22	.055	.830	280 Lbs.	NWP-2722SJ	27	22	.055	.860	358 Lbs.
NWP-3722J	37	22	.060	.960	370 Lbs.	NWP-3722SJ	37	22	.060	.990	460 Lbs.
NWP-4822J	48	22	.060	1.080	470 Lbs.	NWP-4822SJ	48	22	.060	1.110	570 Lbs.
NWP-6022J	60	22	.060	1.200	560 Lbs.	NWP-6022SJ	60	22	.060	1.230	675 Lbs.
NWP-720 J	7	20	.050	.520	120 Lbs.	NWP-720 SJ	7	20	.050	.550	170 Lbs.
NWP-1220J	12	20	.050	.660	200 Lbs.	NWP-1220SJ	12	20	.050	.690	260 Lbs.
NWP-1920J	19	20	.050	.800	290 Lbs.	NWP-1920SJ	19	20	.050	.830	355 Lbs.
NWP-2720J	27	20	.060	.960	420 Lbs.	NWP-2720SJ	27	20	.060	.990	510 Lbs.
NWP-3720J	37	20	.060	1.100	500 Lbs.	NWP-3720SJ	37	20	.060	1.130	603 Lbs.
NWP-4820J	48	20	.060	1.240	620 Lbs.	NWP-4820SJ	48	20	.060	1.270	735 Lbs.
NWP-6020J	60	20	.060	1.380	750 Lbs.	NWP-6020SJ	60	20	.060	1.410	880 Lbs.
NWP-718 J	7	18	.050	.580	150 Lbs.	NWP-718 SJ	7	18	.050	.610	205 Lbs.
NWP-1218J	12	18	.050	.740	290 Lbs.	NWP-1218SJ	12	18	.050	.770	360 Lbs.
NWP-1918J	19	18	.060	.920	400 Lbs.	NWP-1918SJ	19	18	.060	.950	487 Lbs.
NWP-2718J	27	18	.060	1.080	560 Lbs.	NWP-2718SJ	27	18	.060	1.110	660 Lbs.
NWP-3718J	37	18	.060	1.240	750 Lbs.	NWP-3718SJ	37	18	.060	1.270	865 Lbs.
NWP-4818J	48	18	.060	1.400	900 Lbs.	NWP-4818SJ	48	18	.060	1.430	1030 Lbs.
NWP-716 J	7	16	.050	.640	180 Lbs.	NWP-716 SJ	7	16	.050	.670	240 Lbs.
NWP-1216J	12	16	.060	.840	300 Lbs.	NWP-1216SJ	12	16	.060	.870	377 Lbs.
NWP-1916J	19	16	.060	1.020	430 Lbs.	NWP-1916SJ	19	16	.060	1.050	520 Lbs.
NWP-2716J	27	16	.060	1.200	720 Lbs.	NWP-2716SJ	27	16	.060	1.230	830 Lbs.
NWP-3716J	37	16	.060	1.380	1000 Lbs.	NWP-3716SJ	37	16	.060	1.410	1330 Lbs.

COLOR CODING USED ON TWISTED PAIRS

PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS
1.	WHITE WITH BLACK	11.	BLACK WITH RED	21.	BROWN WITH GREEN	31.	ORANGE WITH YELLOW	41.	GREEN WITH VIOLET	51.	WHT/BLK WITH GREEN
2.	WHITE WITH BROWN	12.	BLACK WITH ORANGE	22.	BROWN WITH BLUE	32.	ORANGE WITH GREEN	42.	GREEN WITH GRAY	52.	WHT/BLK WITH BLUE
3.	WHITE WITH RED	13.	BLACK WITH YELLOW	23.	BROWN WITH VIOLET	33.	ORANGE WITH BLUE	43.	BLUE WITH VIOLET	53.	WHT/BLK WITH VIOLET
4.	WHITE WITH ORANGE	14.	BLACK WITH GREEN	24.	BROWN WITH GRAY	34.	ORANGE WITH VIOLET	44.	BLUE WITH GREY	54.	WHT/BLK WITH GRAY
5.	WHITE WITH YELLOW	15.	BLACK WITH BLUE	25.	RED WITH ORANGE	35.	ORANGE WITH GRAY	45.	VIOLET WITH GRAY	55.	WHT/BRN WITH BLACK
6.	WHITE WITH GREEN	16.	BLACK WITH VIOLET	26.	RED WITH YELLOW	36.	YELLOW WITH GREEN	46.	WHT/BLK WITH BLACK	56.	WHT/BRN WITH BROWN
7.	WHITE WITH BLUE	17.	BLACK WITH GRAY	27.	RED WITH GREEN	37.	YELLOW WITH BLUE	47.	WHT/BLK WITH BROWN	57.	WHT/BRN WITH RED
8.	WHITE WITH VIOLET	18.	BROWN WITH RED	28.	RED WITH BLUE	38.	YELLOW WITH VIOLET	48.	WHT/BLK WITH RED	58.	WHT/BRN WITH ORANGE
9.	WHITE WITH GRAY	19.	BROWN WITH ORANGE	29.	RED WITH VIOLET	39.	YELLOW WITH GRAY	49.	WHT/BLK WITH ORANGE	59.	WHT/BRN WITH YELLOW
10.	BLACK WITH BROWN	20.	BROWN WITH YELLOW	30.	RED WITH GRAY	40.	GREEN WITH BLUE	50.	WHT/BLK WITH YELLOW	60.	WHT/BRN WITH GREEN

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Dept. EM, 136 San Fernando Rd., Los Angeles, CA 90031
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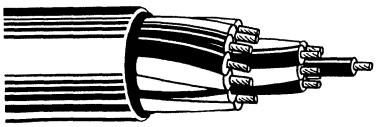
FAX: (213) 225-4630. Fed. Stock Code H4-04569

Miniature Signal & Control Cables Single Conductors (NQ Series)

EXTRA FLEXIBLE — GRAY PVC JACKET



(NQ1928J shown)

GRAY PVC JACKET

National Wire & Cable Corporation manufactures a complete line of highly flexible micro-miniature low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of either foil with drain or a braided shield. Stocked with braided shields.

Conductors are stranded tinned copper with .010″ wall of tough extruded polyvinyl chloride primary insulation, rated for 300 volt use at +80°C under U. L. listed style 1061.* All are color coded using ten standard colors plus white with stripes per MIL-STD-681. Coded pairs use the same sequence as type NXP and NWP.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier under braids. Shielded cables have a tinned copper braid of 90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback; or have a 100% coverage foil shield in intimate contact with a drain wire for easy termination. See Section 3 of our master catalog for relative shield effectiveness.

Outer jacket is highly flexible abrasion-resistant gray polyvinyl chloride thermoplastic, meeting the requirements of U.L. listed style 2464.**

Military certification furnished only when requested.
All materials are flame retardant and fungus resistant.

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

* Wire also meets MIL-W-16878 type B, rated 600 volts, +105°C.

MIL-SPEC & U.L. LISTED **STYLE 2464**

TECHNICAL DATA (all cables)

Insulation breakdown voltage:	Greater than 3000 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 pf/ft at 1kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500VDC from conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500VDC from shield or conductor group through sheath to ground.
Temperature Range:	U.L. rating: +80°C per U.L. style 2464. Military: Continuous use from −40°C to +105°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to −20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at −40°. For continuous flexing applications consult the factory.
Foil Shielded Cables:	The nominal overall diameter of foil shielded cables will be .006″ greater than the non-shielded cables of the same conductor count and wire size.
Characteristic Impedance: (NQP Paired Cables)	Ranges from 150 ohms to 45 ohms, dependent on wire size (AWG), geometry and drive method. Consult our technical staff for data on specific cable types.

MULTI-CONDUCTOR STOCK CABLED SINGLES

Conductor sizes 28, 26, 24, 22 are 7 strand. All others 19 strand.

UNSHIELDED CABLES							OVERALL SHIELDED CABLES						
Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Wght. LB/M'	Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Wght. LB/M'
NQ-228 J	2	28	.034	.031	.135	8	NQ-228 SJ	2	28	.034	.031	.159	16
NQ-328 J	3	28	.034	.031	.142	9	NQ-328 SJ	3	28	.034	.031	.165	17
NQ-428 J	4	28	.034	.031	.150	11	NQ-428 SJ	4	28	.034	.031	.173	20
NQ-528 J	5	28	.034	.031	.161	12	NQ-528 SJ	5	28	.034	.031	.184	21
NQ-628 J	6	28	.034	.031	.171	13	NQ-628 SJ	6	28	.034	.031	.194	23
NQ-728 J	7	28	.034	.031	.171	14	NQ-728 SJ	7	28	.034	.031	.194	24
NQ-828 J	8	28	.034	.031	.196	19	NQ-828 SJ	8	28	.034	.031	.219	31
NQ-928 J	9	28	.034	.031	.206	22	NQ-928 SJ	9	28	.034	.031	.229	35
NQ-1028 J	10	28	.034	.031	.206	23	NQ-1028SJ	10	28	.034	.031	.229	36
NQ-1228 J	12	28	.034	.031	.212	25	NQ-1228SJ	12	28	.034	.031	.235	38
NQ-1528 J	15	28	.034	.031	.231	28	NQ-1528SJ	15	28	.034	.031	.254	42
NQ-1928 J	19	28	.034	.031	.241	33	NQ-1928SJ	19	28	.034	.031	.264	48
NQ-2728 J	27	28	.034	.031	.282	42	NQ-2728SJ	27	28	.034	.031	.305	60
NQ-3728 J	37	28	.034	.031	.311	55	NQ-3728SJ	37	28	.034	.031	.333	75
NQ-226 J	2	26	.038	.031	.144	9	NQ-226 SJ	2	26	.038	.031	.167	17
NQ-326 J	3	26	.038	.031	.150	11	NQ-326 SJ	3	26	.038	.031	.173	20
NQ-426 J	4	26	.038	.031	.160	13	NQ-426 SJ	4	26	.038	.031	.183	22
NQ-526 J	5	26	.038	.031	.171	15	NQ-526 SJ	5	26	.038	.031	.194	25
NQ-626 J	6	26	.038	.031	.183	17	NQ-626 SJ	6	26	.038	.031	.205	28
NQ-726 J	7	26	.038	.031	.183	18	NQ-726 SJ	7	26	.038	.031	.205	29
NQ-826 J	8	26	.038	.031	.210	23	NQ-826 SJ	8	26	.038	.031	.233	36
NQ-926 J	9	26	.038	.031	.222	25	NQ-926 SJ	9	26	.038	.031	.245	39
NQ-1026 J	10	26	.038	.031	.222	26	NQ-1026SJ	10	26	.038	.031	.245	40
NQ-1226 J	12	26	.038	.031	.228	30	NQ-1226SJ	12	26	.038	.031	.251	44
NQ-1526 J	15	26	.038	.031	.249	35	NQ-1526SJ	15	26	.038	.031	.272	51
NQ-1926 J	19	26	.038	.031	.261	42	NQ-1926SJ	19	26	.038	.031	.284	58
NQ-2726 J	27	26	.038	.031	.306	55	NQ-2726SJ	27	26	.038	.031	.329	75
NQ-3726 J	37	26	.038	.031	.339	70	NQ-3726SJ	37	26	.038	.031	.362	92
NO-4826 J	48	26	.038	.031	.384	92	NQ-4826SJ	48	26	.038	.031	.407	117

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(continued on following page)

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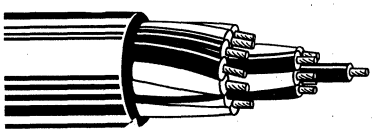
Miniature Signal & Control Cables Single Conductors (NQ Series)

EXTRA FLEXIBLE — GRAY PVC JACKET



(NQ1928J shown)

MIL-SPEC & U.L. LISTED **STYLE 2464**

MULTI-CONDUCTOR STOCK CABLED SINGLES continued from previous page.

UNSHIELDED CABLES

Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Wght. LB/M'
NQ-224 J	2	24	.043	.031	.154	11
NQ-324 J	3	24	.043	.031	.161	13
NQ-424 J	4	24	.043	.031	.172	15
NQ-524 J	5	24	.043	.031	.185	18
NQ-624 J	6	24	.043	.031	.198	21
NQ-724 J	7	24	.043	.031	.198	23
NQ-824 J	8	24	.043	.031	.229	27
NQ-924 J	9	24	.043	.031	.242	30
NQ-1024 J	10	24	.043	.031	.242	32
NQ-1224 J	12	24	.043	.031	.249	37
NQ-1524 J	15	24	.043	.031	.273	44
NQ-1924 J	19	24	.043	.031	.286	53
NQ-2724 J	27	24	.043	.031	.337	70
NQ-3724 J	37	24	.043	.031	.374	93
NQ-4824 J	48	24	.043	.031	.425	120
NQ-6024 J	60	24	.043	.031	.462	145
NQ-222 J	2	22	.050	.031	.166	13
NQ-322 J	3	22	.050	.031	.174	17
NQ-422 J	4	22	.050	.031	.186	20
NQ-522 J	5	22	.050	.031	.201	25
NQ-622 J	6	22	.050	.031	.216	28
NQ-722 J	7	22	.050	.031	.216	31
NQ-822 J	8	22	.050	.031	.251	36
NQ-922 J	9	22	.050	.031	.266	40
NQ-1022 J	10	22	.050	.031	.266	43
NQ-1222 J	12	22	.050	.031	.274	50
NQ-1522 J	15	22	.050	.031	.301	60
NQ-1922 J	19	22	.050	.031	.316	73
NQ-2722 J	27	22	.050	.031	.374	100
NQ-3722 J	37	22	.050	.031	.416	142
NQ-4822 J	48	22	.050	.031	.474	169
NQ-6022 J	60	22	.050	.031	.590	210
NQ-220 J	2	20	.057	.031	.182	17
NQ-320 J	3	20	.057	.031	.191	23
NQ-420 J	4	20	.057	.031	.205	28
NQ-520 J	5	20	.057	.031	.223	33
NQ-620 J	6	20	.057	.031	.240	39
NQ-720 J	7	20	.057	.031	.240	43
NQ-820 J	8	20	.057	.031	.281	51
NQ-920 J	9	20	.057	.031	.298	55
NQ-1020 J	10	20	.057	.031	.298	60
NQ-1220 J	12	20	.057	.031	.307	70
NQ-1520 J	15	20	.057	.031	.339	85
NQ-1920 J	19	20	.057	.031	.356	103
NQ-2720 J	27	20	.057	.031	.423	143
NQ-3720 J	37	20	.057	.031	.472	190
NQ-218 J	2	18	.068	.031	.202	23
NQ-318 J	3	18	.068	.031	.213	29
NQ-418 J	4	18	.068	.031	.229	37
NQ-518 J	5	18	.068	.031	.250	44
NQ-618 J	6	18	.068	.031	.270	52
NQ-718 J	7	18	.068	.031	.270	59
NQ-818 J	8	18	.068	.031	.318	68
NQ-918 J	9	18	.068	.031	.338	75
NQ-1018 J	10	18	.068	.031	.338	82
NQ-1218 J	12	18	.068	.031	.349	96
NQ-1518 J	15	18	.068	.031	.386	117
NQ-1918 J	19	18	.068	.031	.406	144
NQ-2718 J	27	18	.068	.031	.484	206

OVERALL SHIELDED CABLES

Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Wght. LB/M'
NQ-224 SJ	2	24	.043	.031	.177	20
NQ-324 SJ	3	24	.043	.031	.184	22
NQ-424 SJ	4	24	.043	.031	.195	25
NQ-524 SJ	5	24	.043	.031	.208	29
NQ-624 SJ	6	24	.043	.031	.221	33
NQ-724 SJ	7	24	.043	.031	.221	35
NQ-824 SJ	8	24	.043	.031	.252	41
NQ-924 SJ	9	24	.043	.031	.265	45
NQ-1024SJ	10	24	.043	.031	.265	47
NQ-1224SJ	12	24	.043	.031	.272	53
NQ-1524SJ	15	24	.043	.031	.296	61
NQ-1924SJ	19	24	.043	.031	.309	71
NQ-2724SJ	27	24	.043	.031	.360	92
NQ-3724SJ	37	24	.043	.031	.397	118
NQ-4824SJ	48	24	.043	.031	.453	148
NQ-6024SJ	60	24	.043	.031	.490	176
NQ-222 SJ	2	22	.050	.031	.189	23
NQ-322 SJ	3	22	.050	.031	.197	27
NQ-422 SJ	4	22	.050	.031	.209	31
NQ-522 SJ	5	22	.050	.031	.224	37
NQ-622 SJ	6	22	.050	.031	.239	41
NQ-722 SJ	7	22	.050	.031	.239	44
NQ-822 SJ	8	22	.050	.031	.274	52
NQ-922 SJ	9	22	.050	.031	.289	57
NQ-1022SJ	10	22	.050	.031	.289	60
NQ-1222SJ	12	22	.050	.031	.297	67
NQ-1522SJ	15	22	.050	.031	.324	79
NQ-1922SJ	19	22	.050	.031	.339	93
NQ-2722SJ	27	22	.050	.031	.397	125
NQ-3722SJ	37	22	.050	.031	.434	169
NQ-4822SJ	48	22	.050	.031	.502	201
NQ-6022SJ	60	22	.050	.031	.618	245
NQ-220 SJ	2	20	.057	.031	.205	28
NQ-320 SJ	3	20	.057	.031	.214	35
NQ-420 SJ	4	20	.057	.031	.228	41
NQ-520 SJ	5	20	.057	.031	.246	47
NQ-620 SJ	6	20	.057	.031	.263	54
NQ-720 SJ	7	20	.057	.031	.263	58
NQ-820 SJ	8	20	.057	.031	.304	69
NQ-920 SJ	9	20	.057	.031	.321	74
NQ-1020SJ	10	20	.057	.031	.321	79
NQ-1220SJ	12	20	.057	.031	.330	90
NQ-1520SJ	15	20	.057	.031	.362	107
NQ-1920SJ	19	20	.057	.031	.379	126
NQ-2720SJ	27	20	.057	.031	.451	171
NQ-3720SJ	37	20	.057	.031	.500	221
NQ-218 SJ	2	18	.068	.031	.225	35
NQ-318 SJ	3	18	.068	.031	.236	42
NQ-418 SJ	4	18	.068	.031	.252	51
NQ-518 SJ	5	18	.068	.031	.273	60
NQ-618 SJ	6	18	.068	.031	.293	69
NQ-718 SJ	7	18	.068	.031	.293	76
NQ-818 SJ	8	18	.068	.031	.341	88
NQ-918 SJ	9	18	.068	.031	.361	97
NQ-1018SJ	10	18	.068	.031	.361	104
NQ-1218SJ	12	18	.068	.031	.372	119
NQ-1518SJ	15	18	.068	.031	.409	142
NQ-1918SJ	19	18	.068	.031	.434	171
NQ-2718SJ	27	18	.068	.031	.513	238

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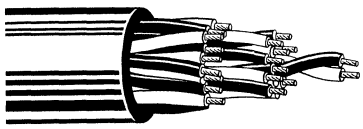
Miniature Signal & Control Cables Twisted Pairs (NQP Series)

EXTRA FLEXIBLE — GRAY PVC JACKET



(NQP1928J shown)

MIL-SPEC & U.L. LISTED **STYLE 2464**

GRAY PVC JACKET

National Wire & Cable Corporation manufactures a complete line of highly flexible micro-miniature low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of either foil with drain or a braided shield. Stocked with braided shields.

Conductors are stranded tinned copper with .010" wall of tough extruded polyvinyl chloride primary insulation, rated for 300 volt use at +80°C under U. L. listed style 1061.* All are color coded using ten standard colors plus white with stripes per MIL-STD-681. Coded pairs use the same sequence as type NXP and NWP.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier under braids. Shielded cables have a tinned copper braid of 90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback; or have a 100% coverage foil shield in intimate contact with a drain wire for easy termination. See Section 3 of our master catalog for relative shield effectiveness.

Outer jacket is highly flexible abrasion-resistant gray polyvinyl chloride thermoplastic, meeting the requirements of U.L. listed style 2464.**

Military certification furnished only when requested.

All materials are flame retardant and fungus resistant.

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

* Wire also meets MIL-W-16878 type B, rated 600 volts, +105°C.

** Jacket material is military rated for +105°C; meets MIL-I-631, Class F.

TECHNICAL DATA (all cables)

Insulation breakdown voltage:	Greater than 3000 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 pf/ft at 1kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500VDC from conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500VDC from shield or conductor group through sheath to ground.
Temperature Range:	U.L. rating: +80°C per U.L. style 2464. Military: Continuous use from −40°C to +105°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to −20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at −40°. For continuous flexing applications consult the factory.
Foil Shielded Cables:	The nominal overall diameter of foil shielded cables will be .006" greater than the non-shielded cables of the same conductor count and wire size.
Characteristic Impedance: (NQP Paired Cables)	Ranges from 150 ohms to 45 ohms, dependent on wire size (AWG), geometry and drive method. Consult our technical staff for data on specific cable types.

MULTI-CONDUCTOR STOCK CABLED PAIRS

UNSHIELDED CABLES							OVERALL SHIELDED CABLES						
No. Part	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	LB/M' Wght.	Part No.	Pairs No. of	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	LB/M' Wght.
NQP- 228J	2	28	.034	.031	.206	15	NQP- 228SJ	2	28	.034	.031	.229	28
NQP- 328J	3	28	.034	.031	.217	16	NQP- 328SJ	3	28	.034	.031	.240	29
NQP- 428J	4	28	.034	.031	.234	20	NQP- 428SJ	4	28	.034	.031	.257	35
NQP- 528J	5	28	.034	.031	.255	23	NQP- 528SJ	5	28	.034	.031	.278	37
NQP- 628J	6	28	.034	.031	.276	29	NQP- 628SJ	6	28	.034	.031	.299	46
NQP- 728J	7	28	.034	.031	.276	28	NQP- 728SJ	7	28	.034	.031	.299	45
NQP- 828J	8	28	.034	.031	.325	34	NQP- 828SJ	8	28	.034	.031	.348	55
NQP- 928J	9	28	.034	.031	.346	41	NQP- 928SJ	9	28	.034	.031	.369	63
NQP-1028J	10	28	.034	.031	.346	39	NQP-1028SJ	10	28	.034	.031	.369	61
NQP-1228J	12	28	.034	.031	.357	43	NQP-1228SJ	12	28	.034	.031	.380	66
NQP-1528J	15	28	.034	.031	.395	55	NQP-1528SJ	15	28	.034	.031	.423	81
NQP-1928J	19	28	.034	.031	.416	61	NQP-1928SJ	19	28	.034	.031	.444	88
NQP- 226J	2	26	.038	.031	.222	20	NQP- 226SJ	2	26	.038	.031	.245	34
NQP- 326J	3	26	.038	.031	.234	21	NQP- 326SJ	3	26	.038	.031	.257	36
NQP- 426J	4	26	.038	.031	.253	26	NQP- 426SJ	4	26	.038	.031	.276	42
NQP- 526J	5	26	.038	.031	.277	34	NQP- 526SJ	5	26	.038	.031	.300	52
NQP- 626J	6	26	.038	.031	.300	37	NQP- 626SJ	6	26	.038	.031	.323	56
NQP- 726J	7	26	.038	.031	.300	38	NQP- 726SJ	7	26	.038	.031	.323	57
NQP- 826J	8	26	.038	.031	.355	52	NQP- 826SJ	8	26	.038	.031	.378	75
NQP- 926J	9	26	.038	.031	.370	60	NQP- 926SJ	9	26	.038	.031	.393	85
NQP-1026J	10	26	.038	.031	.370	51	NQP-1026SJ	10	26	.038	.031	.393	76
NQP-1226J	12	26	.038	.031	.382	59	NQP-1226SJ	12	26	.038	.031	.405	84
NQP-1526J	15	26	.038	.031	.420	75	NQP-1526SJ	15	26	.038	.031	.448	103
NQP-1926J	19	26	.038	.031	.441	85	NQP-1926SJ	19	26	.038	.031	.469	115
NQP-2726J	27	26	.038	.031	.530	115	NQP-2726SJ	27	26	.038	.031	.558	152

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(continued on following page)

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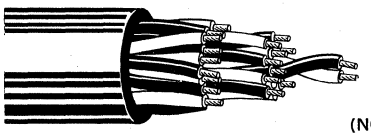
Miniature Signal & Control Cables Twisted Pairs (NQP Series)

EXTRA FLEXIBLE — GRAY PVC JACKET



(NQP1928J shown)

MIL-SPEC & U.L. LISTED **STYLE 2464**

MULTI-CONDUCTOR STOCK CABLED PAIRS continued from previous page.

UNSHIELDED CABLES

Part No.	No. Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Wght. LB/M'
NQP- 224J	2	24	.043	.031	.216	24
NQP- 324J	3	24	.043	.031	.237	26
NQP- 424J	4	24	.043	.031	.256	32
NQP- 524J	5	24	.043	.031	.280	40
NQP- 624J	6	24	.043	.031	.312	46
NQP- 724J	7	24	.043	.031	.312	47
NQP- 824J	8	24	.043	.031	.365	65
NQP- 924J	9	24	.043	.031	.383	75
NQP-1024J	10	24	.043	.031	.383	65
NQP-1224J	12	24	.043	.031	.395	74
NQP-1524J	15	24	.043	.031	.444	95
NQP-1924J	19	24	.043	.031	.462	108
NQP-2724J	27	24	.043	.031	.554	141
NQP- 222J	2	22	.050	.031	.236	30
NQP- 322J	3	22	.050	.031	.260	33
NQP- 422J	4	22	.050	.031	.282	42
NQP- 522J	5	22	.050	.031	.309	51
NQP- 622J	6	22	.050	.031	.346	62
NQP- 722J	7	22	.050	.031	.346	64
NQP- 822J	8	22	.050	.031	.406	87
NQP- 922J	9	22	.050	.031	.426	100
NQP-1022J	10	22	.050	.031	.426	88
NQP-1222J	12	22	.050	.031	.440	102
NQP-1522J	15	22	.050	.031	.496	131
NQP-1922J	19	22	.050	.031	.516	143
NQP-2722J	27	22	.050	.031	.620	198
NQP- 220J	2	20	.057	.031	.263	39
NQP- 320J	3	20	.057	.031	.292	45
NQP- 420J	4	20	.057	.031	.312	57
NQP- 520J	5	20	.057	.031	.348	70
NQP- 620J	6	20	.057	.031	.391	85
NQP- 720J	7	20	.057	.031	.391	89
NQP- 820J	8	20	.057	.031	.460	121
NQP- 920J	9	20	.057	.031	.484	139
NQP-1020J	10	20	.057	.031	.484	124
NQP-1220J	12	20	.057	.031	.500	144
NQP-1520J	15	20	.057	.031	.565	176
NQP-1920J	19	20	.057	.031	.588	205
NQP- 218J	2	18	.068	.031	.297	52
NQP- 318J	3	18	.068	.031	.330	60
NQP- 418J	4	18	.068	.031	.360	77
NQP- 518J	5	18	.068	.031	.396	96
NQP- 618J	6	18	.068	.031	.447	117
NQP- 718J	7	18	.068	.031	.447	122
NQP-1218J	12	18	.068	.031	.575	188

OVERALL SHIELDED CABLES

Part No.	No. Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Wght. LB/M'
NQP- 224SJ	2	24	.043	.031	.239	39
NQP- 324SJ	3	24	.043	.031	.260	42
NQP- 424SJ	4	24	.043	.031	.279	50
NQP- 524SJ	5	24	.043	.031	.303	59
NQP- 624SJ	6	24	.043	.031	.335	67
NQP- 724SJ	7	24	.043	.031	.335	68
NQP- 824SJ	8	24	.043	.031	.390	91
NQP- 924SJ	9	24	.043	.031	.406	102
NQP-1024SJ	10	24	.043	.031	.406	92
NQP-1224SJ	12	24	.043	.031	.418	102
NQP-1524SJ	15	24	.043	.031	.467	127
NQP-1924SJ	19	24	.043	.031	.485	142
NQP-2724SJ	27	24	.043	.031	.577	185
NQP- 222SJ	2	22	.050	.031	.259	47
NQP- 322SJ	3	22	.050	.031	.283	51
NQP- 422SJ	4	22	.050	.031	.305	62
NQP- 522SJ	5	22	.050	.031	.332	73
NQP- 622SJ	6	22	.050	.031	.369	86
NQP- 722SJ	7	22	.050	.031	.369	88
NQP- 822SJ	8	22	.050	.031	.430	116
NQP- 922SJ	9	22	.050	.031	.449	131
NQP-1022SJ	10	22	.050	.031	.449	119
NQP-1222SJ	12	22	.050	.031	.463	134
NQP-1522SJ	15	22	.050	.031	.519	167
NQP-1922SJ	19	22	.050	.031	.539	180
NQP-2722SJ	27	22	.050	.031	.645	245
NQP- 220SJ	2	20	.057	.031	.286	58
NQP- 320SJ	3	20	.057	.031	.315	65
NQP- 420SJ	4	20	.057	.031	.335	79
NQP- 520SJ	5	20	.057	.031	.371	95
NQP- 620SJ	6	20	.057	.031	.414	112
NQP- 720SJ	7	20	.057	.031	.414	116
NQP- 820SJ	8	20	.057	.031	.483	154
NQP- 920SJ	9	20	.057	.031	.507	174
NQP-1020SJ	10	20	.057	.031	.507	159
NQP-1220SJ	12	20	.057	.031	.525	181
NQP-1520SJ	15	20	.057	.031	.588	216
NQP-1920SJ	19	20	.057	.031	.615	248
NQP- 218SJ	2	18	.068	.031	.320	74
NQP- 318SJ	3	18	.068	.031	.353	83
NQP- 418SJ	4	18	.068	.031	.383	103
NQP- 518SJ	5	18	.068	.031	.420	124
NQP- 618SJ	6	18	.068	.031	.475	148
NQP- 718SJ	7	18	.068	.031	.475	153
NQP-1218SJ	12	18	.068	.031	.600	230

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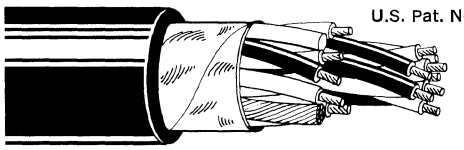
IN STOCK

Digital Data Transmission Cables

(D-200 Series)



U.S. Pat. No. 3489844

Grey (Extra Flexible) or Black Vinyl Jackets
D-200 XX (XX designates number of pairs)
D-200 XXRF (RF designates braided shield over aluminum mylar foil shield) △

LOW VOLTAGE COMPUTER CABLE

THE D-200 SERIES CABLES ARE MULTIPLE-PAIR FLEXIBLE CABLES DESIGNED FOR TRANSMISSION OF DIGITAL PULSE SIGNALS BETWEEN A COMPUTER AND ITS PERIPHERAL EQUIPMENT.

DESIGN FEATURES OF THE D-200 SERIES DIGITAL DATA CABLE

Unlike conventional flexible cable construction, the primary features offered by the D-200 series data cable are the high and accurately controlled characteristic impedance of every pair, regardless of its position in the cable and special geometry chosen to reduce crosstalk.

ADVANTAGES

1. Less crosstalk and noise from mismatched loads, due to proper matching.
2. Uniform light loading on drivers allows direct I.C. drive, accurate prediction of current demands from power supply, and driver power dissipation.
3. Proper load match reduces re-flection and inversion noise where driver end is not matched to line. (Typical of TTL.)
4. Special geometry and pair construction provides exceptionally close capacitance balance between pair wires, reducing differential crosstalk.

USAGE

We recommend use of balanced drive and differential-input line receivers for lowest crosstalk and best pulse reproduction, utilizing the 110 ohm balanced impedance of the pairs. With such a system, TTL speeds have been used on D-200 cable at 1 mc data rates over 1000 ft.

Where the system is single-ended drive and receive, all pairs exhibit the 78 ohm impedance. Since these line receivers cannot discriminate between noise and the desired signal, crosstalk limits the cable distance over which transmission is reliable. Typical runs for DTL having 50 ns risetimes are 200 ft. Where risetimes can be slowed to longer than 100 ns, run lengths are practical to 500 ft. Without differential line reception, runs over 500 ft are not recommended for D-200 cable due to external noise aspects.

The D-210 series cable are recommended for high noise or long-run application. (Utilizing individual shields.)

Although use of balanced drive and differential line reception will avoid most noise problems, there are some installations where the expected external noise is unknown but assumed to be very great. Here, the use of data cables having individually-shielded pairs may be considered as conservative engineering practice. The assurance of a lower received noise may justify the increased size, cost and rise-time.

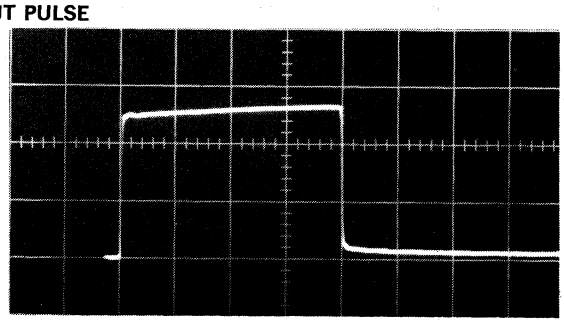
For these high noise-long run applications, Dynatronic Cable Engineering Corp has developed the D-210 series data cables. Electrical performance is essentially the same as the D-200 series cables, which use only an overall shield. △ An overall tinned-copper shield braid may be specified on either series by the suffix -RF on the part number. Standard D-200 shield is aluminum-mylar foil.

For runs of 1000-5000 ft. or where extra-fast output pulse risetime is required, we offer the D-220 series cable: a larger version of the D-200 series having improved transmission properties with sufficient mechanical strength for long pulls in conduit. Consult factory for technical data.

PULSE TRANSMISSION LOSS in D-series data cables causes a moderate amplitude loss, with definite rounding of the leading and trailing edges from 50% to 90% amplitude. The photos below (for a 1.25 megabit clock rate) show typical waveforms. The D-220 and D-222 series cables offer even lower losses than the D-200 or D-210 cables for long-run or fast-clocked applications.

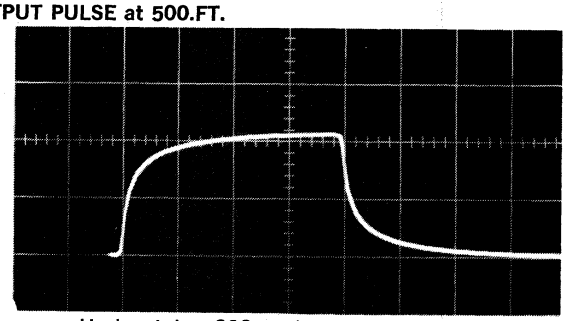
Contact our factory engineering staff for detailed pulse-shape versus distance information, or for special applications.

INPUT PULSE



Horizontal: 200. ns/cm
Vertical : 2. volts/cm

OUTPUT PULSE at 500.FT.



Horizontal: 200. ns/cm
Vertical : 2. volts/cm

We invite your telephone inquiries for technical information on data cables. Contact Mr. Frank Motley or Steve Keith in our Engineering Dept.

NATIONAL WIRE AND CABLE CORPORATION

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Manufactured by our affiliate, Dynatronic Cable Engineering Corp.

Digital Data Transmission Cables (D-200 Series continued)

UL AWM STYLE 2835 Low Voltage Computer Cable

STANDARD DATA CABLE CONSTRUCTIONS — D-200 SERIES

Part No. Black Jacket	Part No. Extra Flexible Gray Jacket	No. of Pairs	Cond. AWG.	Delay NS/FT	Cable Diam.	Weight (Lbs. per M ft.)
D-200-4	D-200-4G	4	24	1.61	.315″	41.
D-200-7	D-200-7G	7	24	1.61	.410″	73.
D-200-12	D-200-12G	12	24	1.61	.455″	96.
D-200-15	D-200-15G	15	24	1.61	.510″	120.
D-200-20	D-200-20G	20	24	1.61	.635″	160.
D-200-24	D-200-24G	24	24	1.61	.660″	180.
D-200-27	D-200-27G	27	24	1.61	.690″	210.
D-200-30	D-200-30G	30	24	1.61	.710″	230.
D-200-33	D-200-33G	33	24	1.61	.750″	250.
D-200-42	D-200-42G	42	24	1.61	.840″	280.
D-200-50	D-200-50G	50	24	1.61	.910″	320.

TECHNICAL DATA

Characteristic	Balanced**	Single-ended*
Characteristic Impedance	110. ohms ±5%	78. ohms ±4%
Capacitance	14. pf/ft.	21. pf/ft.
Signal Delay	1.61 ns/ft.	1.61 ns/ft.
DC Resistance/100 ft.	5.6 ohms loop	2.8 ohms
Insulation Breakdown	6. KV min. DC	6. KV min. DC
Insulation Resistance	> 1000. megohms/M′	> 1000. megohms/M′
Temperature Range	−20. C up to +80. C (60. C for U.L.)	
Min. Bend Radius	6 x cable diameter	

*One conductor of each pair tied to common.

STANDARD DATA CABLE CONSTRUCTIONS — D-210 SERIES INDIVIDUALLY SHIELDED DATA PAIRS

Part. No.	No. of Pairs	Z_o	Delay NS/FT	Cond. AWG.	Cable Diam.	Sheath
D-210-1	1	110.	1.61	24	.220	PVC
D-210-12	12	110.	1.61	24	.980	PVC
D-210-15	15	110.	1.61	24	1.06	PVC
D-210-20	20	110.	1.61	24	1.20	PVC
D-210-30	30	110.	1.61	24	1.42	PVC
D-210-40	40	110.	1.61	24	1.69	PVC
D-210-48	48	110.	1.61	24	1.76	PVC

All items available in 50 ft. multiples.

TECHNICAL DATA

Characteristic	Balanced**	Single-ended*
Characteristic Impedance	110. ohms ±5%	63. ohms ±4%
Capacitance	14. pf/ft.	23.5 pf/ft.
Signal Delay	1.61 ns/ft.	1.61 ns/ft.
DC Resistance/100 ft.	5.6 ohms loop	2.8 ohms
Insulation Breakdown	6. KV min. DC	6. KV min. DC
Insulation Resistance	> 1000. megohms/M′	> 1000. megohms/M′
Temperature Range	−20. C up to +80. C (60. C for U.L.)	
Min. Bend Radius	9 x cable diameter	

**Both driven, one inverted. *One conductor of each pair tied to common.

We invite your telephone inquiries for technical information on data cables. Contact Mr. Frank Motley or Mr. Steve Keith in our Engineering Dept.

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TRAY CABLES NEC 725

CABLED SINGLES (NL SERIES)

NEC UL LISTED CL 2

SIGNAL & CONTROL TRAY CABLES

National Wire & Cable Corporation manufactures a complete line of DUAL-RATED multiconductor NEC TRAY CABLE Type CL2, for signal, instrumentation and control uses. Also UL rated for use as 300 Volt Appliance Wiring Material (AWM). These are available as cabled singles or pairs, with optional overall shield of aluminum-Mylar foil with drain wire.

Cabled conductors use stranded tinned copper wire with 0.010" wall of tough extruded poly-vinyl-chloride (PVC) insulation, rated for 300. Volt use under U.L. Style 2464.

All wires are color coded using 10 standard solid colors plus white with stripes. Cabled singles are color coded the same as our NQ and NX cable families per MIL-STD-681. (See table in Tech section.) Cabled pairs are color coded the same as our NQP and NXP cable families.

Conductors are helically cabled and laid for optimum flexibility, with a Mylar tape barrier wrap (or Mylar + Foil) applied between cabled wire bundle and outer jacket.

Shielded cables have an overall Aluminum-Mylar foil shielding tape helically wrapped over cable and a tinned uninsulated drain wire for shield connection. (Use FSJ part number suffix.) For optional composite tinned copper RFI braid(s) + foil shielding, consult factory.

Outer jacket is a special highly flexible abrasion-resistant black poly-vinyl-chloride (PVC) thermoplastic. DUAL-RATED jacket compound meets the requirements of both U.L. Style 2464 AWM and U.L. 13 Type CL2 TRAY CABLE. Jacket is surface printed with both UL 2464 AWM and U.L. 13 Type CL2 TRAY CABLE identifiers.

Finished cables comply with applicable U.L. tests for N.E.C. Type CL2 TRAY CABLE Vertical Tray Flame Spread. All materials are flame-spread retardant and fungus resistant. The products are DUAL-RATED for AWM use as U.L. Style 2464 300 Volt, 80°C, OR for U.L. 13 Type CL2 TRAY CABLE 105°C use.

Standard putups: 500 ft. and 1000 ft. No-deposit reels. For shorter quantities or specific lengths consult factory.

TECHNICAL DATA (all cables)

Rated Working Voltage:	300 VOLTS for AWM uses.
Rated Temperature:	DUAL-RATED: + 105°C or + 80°C dependent on AGENCY intended use. See below.
Insulation Breakdown Voltage:	Greater than 1000 Volts AC RMS at 60 Hz.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 PF/FT at 1 Khz, depending on AWG and position.
Insulation Leakage:	100 Megohms/1000 feet minimum @ 500 VDC; from a conductor to all else in a cable, at 25°C.
U.L. Agency Voltage & Temperature Ratings:	UL rated: + 80°C AWM, 300 VOLT per UL Style 2464. UL rated + 105°C CL2 TRAY CABLE per UL 13, NEC Type CL2.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 8 cable diameters from + 105°C to − 10°C. The flex diameter should be greater than 20 cable diameters for flexing at − 20°C.
Characteristic Impedance:	RF Impedance of twisted pairs or adjacent singles is: 87 ohms in AWG 24; 80 ohms in AWG 22. Suitable for digital signals.

MULTI-CONDUCTOR STOCK CABLED SINGLES

Conductor sizes 24, 22 are 7 strand. All others 19 strand.

UNSHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NL224J	2	24	.044	.032	.156	11
NL324J	3	24	.044	.032	.163	14
NL424J	4	24	.044	.032	.174	17
NL524J	5	24	.044	.032	.187	19
NL624J	6	24	.044	.032	.200	22
NL724J	7	24	.044	.032	.200	24
NL824J	8	24	.044	.032	.231	28
NL924J	9	24	.044	.032	.244	31
NL1024J	10	24	.044	.032	.244	33
NL1224J	12	24	.044	.032	.251	37
NL1524J	15	24	.044	.032	.275	45
NL1924J	19	24	.044	.032	.288	54
NL2724J	27	24	.044	.032	.339	73
NL3724J	37	24	.044	.032	.376	96
NL4824J	48	24	.044	.032	.424	121
NL6024J	60	24	.044	.032	.464	148
NL222J	2	22	.050	.032	.168	14
NL322J	3	22	.050	.032	.176	17
NL422J	4	22	.050	.032	.188	21
NL522J	5	22	.050	.032	.203	25
NL622J	6	22	.050	.032	.218	29
NL722J	7	22	.050	.032	.218	32
NL822J	8	22	.050	.032	.253	37
NL922J	9	22	.050	.032	.268	40
NL1022J	10	22	.050	.032	.268	43
NL1222J	12	22	.050	.032	.276	50
NL1522J	15	22	.050	.032	.303	60
NL1922J	19	22	.050	.032	.318	73
NL2722J	27	22	.050	.032	.376	100
NL3722J	37	22	.050	.032	.418	131
NL4822J	48	22	.050	.032	.473	167
NL6022J	60	22	.050	.032	.518	205

OVERALL SHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NL224FSJ	2	24	.044	.032	.158	13
NL324FSJ	3	24	.044	.032	.165	15
NL424FSJ	4	24	.044	.032	.176	18
NL524FSJ	5	24	.044	.032	.189	21
NL624FSJ	6	24	.044	.032	.202	24
NL724FSJ	7	24	.044	.032	.202	26
NL824FSJ	8	24	.044	.032	.233	30
NL924FSJ	9	24	.044	.032	.246	32
NL1024FSJ	10	24	.044	.032	.246	34
NL1224FSJ	12	24	.044	.032	.253	39
NL1524FSJ	15	24	.044	.032	.277	46
NL1924FSJ	19	24	.044	.032	.290	55
NL2724FSJ	27	24	.044	.032	.341	75
NL3724FSJ	37	24	.044	.032	.378	97
NL4824FSJ	48	24	.044	.032	.427	122
NL6024FSJ	60	24	.044	.032	.466	149
NL222FSJ	2	22	.050	.032	.170	16
NL322FSJ	3	22	.050	.032	.178	20
NL422FSJ	4	22	.050	.032	.190	23
NL522FSJ	5	22	.050	.032	.205	27
NL622FSJ	6	22	.050	.032	.220	31
NL722FSJ	7	22	.050	.032	.220	34
NL822FSJ	8	22	.050	.032	.255	39
NL922FSJ	9	22	.050	.032	.270	43
NL1022FSJ	10	22	.050	.032	.270	46
NL1222FSJ	12	22	.050	.032	.278	52
NL1522FSJ	15	22	.050	.032	.305	62
NL1922FSJ	19	22	.050	.032	.320	75
NL2722FSJ	27	22	.050	.032	.378	102
NL3722FSJ	37	22	.050	.032	.420	134
NL4822FSJ	48	22	.050	.032	.475	169
NL6022FSJ	60	22	.050	.032	.520	207

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TRAY CABLES
NEC 725

CABLED SINGLES (NL SERIES)

SIGNAL & CONTROL TRAY CABLES

NEC UL LISTED CL 2

MULTI-CONDUCTOR STOCK CABLED SINGLES

continued from previous page.

UNSHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NL220J	2	20	.058	.032	.184	18
NL320J	3	20	.058	.032	.193	24
NL420J	4	20	.058	.032	.207	29
NL520J	5	20	.058	.032	.225	35
NL620J	6	20	.058	.032	.242	41
NL720J	7	20	.058	.032	.242	46
NL820J	8	20	.058	.032	.283	53
NL920J	9	20	.058	.032	.300	58
NL1020J	10	20	.058	.032	.300	63
NL1220J	12	20	.058	.032	.309	73
NL1520J	15	20	.058	.032	.341	89
NL1920J	19	20	.058	.032	.358	109
NL2720J	27	20	.058	.032	.425	151
NL3720J	37	20	.058	.032	.474	201
NL218J	2	18	.068	.032	.204	24
NL318J	3	18	.068	.032	.215	32
NL418J	4	18	.068	.032	.231	40
NL518J	5	18	.068	.032	.252	48
NL618J	6	18	.068	.032	.272	56
NL718J	7	18	.068	.032	.272	63
NL818J	8	18	.068	.032	.320	73
NL918J	9	18	.068	.032	.340	81
NL1018J	10	18	.068	.032	.340	88
NL1218J	12	18	.068	.032	.351	102
NL1518K	15	18	.068	.032	.388	126
NL1918J	19	18	.068	.032	.408	155
NL2718J	27	18	.068	.032	.487	215

OVERALL SHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NL220FSJ	2	20	.058	.032	.186	22
NL320FSJ	3	20	.058	.032	.195	28
NL420FSJ	4	20	.058	.032	.209	33
NL520FSJ	5	20	.058	.032	.227	39
NL620FSJ	6	20	.058	.032	.244	45
NL720FSJ	7	20	.058	.032	.244	49
NL820FSJ	8	20	.058	.032	.285	56
NL920FSJ	9	20	.058	.032	.302	62
NL1020FSJ	10	20	.058	.032	.302	67
NL1220FSJ	12	20	.058	.032	.311	77
NL1520FSJ	15	20	.058	.032	.343	93
NL1920FSJ	19	20	.058	.032	.360	113
NL2720FSJ	27	20	.058	.032	.427	155
NL3720FSJ	37	20	.058	.032	.476	205
NL218FSJ	2	18	.068	.032	.206	30
NL318FSJ	3	18	.068	.032	.217	38
NL418FSJ	4	18	.068	.032	.233	46
NL518FSJ	5	18	.068	.032	.254	54
NL618FSJ	6	18	.068	.032	.274	62
NL718FSJ	7	18	.068	.032	.274	69
NL818FSJ	8	18	.068	.032	.322	79
NL918FSJ	9	18	.068	.032	.342	87
NL1018FSJ	10	18	.068	.032	.342	94
NL1218FSJ	12	18	.068	.032	.353	108
NL1518FSJ	15	18	.068	.032	.390	131
NL1918FSJ	19	18	.068	.032	.410	160
NL2718FSJ	27	18	.068	.032	.489	221

NATIONAL WIRE
AND CABLE CORPORATION

Dept. EM, 136 San Fernando Rd., Los Angeles, CA 90031
Phone: (213) 225-5611, TWX: 910-321-4155, TLX: 181409,
FAX: (213) 225-4630. Fed. Stock Code H4-04569

TRAY CABLES NEC 725

TWISTED PAIRS (NLP SERIES)

NEC UL LISTED CL2

SIGNAL & CONTROL TRAY CABLES

National Wire & Cable Corporation manufactures a complete line of DUAL-RATED multiconductor NEC TRAY CABLE Type CL2, for signal, instrumentation and control uses. Also UL rated for use as 300 Volt Appliance Wiring Material (AWM). These are available as cabled singles or pairs, with optional overall shield of aluminum-Mylar foil with drain wire.

Cabled conductors use stranded tinned copper wire with 0.010" wall of tough extruded poly-vinyl-chloride (PVC) insulation, rated for 300. Volt use under U.L. Style 2464.

All wires are color coded using 10 standard solid colors plus white with stripes. Cabled singles are color coded the same as our NQ and NX cable families per MIL-STD-681. (See table in Tech section.) Cabled pairs are color coded the same as our NQP and NXP cable families.

Conductors are helically cabled and laid for optimum flexibility, with a Mylar tape barrier wrap (or Mylar + Foil) applied between cabled wire bundle and outer jacket.

Shielded cables have an overall Aluminum-Mylar foil shielding tape helically wrapped over cable and a tinned uninsulated drain wire for shield connection. (Use FSJ part number suffix.) For optional composite tinned copper RFI braid(s) + foil shielding, consult factory.

Outer jacket is a special highly flexible abrasion-resistant black poly-vinyl-chloride (PVC) thermoplastic. DUAL-RATED jacket compound meets the requirements of both U.L. Style 2464 AWM and U.L. 13 Type CL2 TRAY CABLE. Jacket is surface printed with both UL 2464 AWM and U.L. 13 Type CL2 TRAY CABLE identifiers.

Finished cables comply with applicable U.L. tests for N.E.C. Type CL2 TRAY CABLE Vertical Tray Flame Spread. All materials are flame-spread retardant and fungus resistant. The products are DUAL-RATED for AWM use as U.L. Style 2464 300 Volt, 80°C, OR for U.L. 13 Type CL2 TRAY CABLE 105°C use.

Standard putups: 500 ft. and 1000 ft. No-deposit reels. For shorter quantities or specific lengths consult factory.

TECHNICAL DATA (all cables)

Rated Working Voltage: 300 VOLTS for AWM uses.

Rated Temperature: DUAL-RATED: + 105°C or + 80°C dependent on AGENCY intended use. See below.

Insulation Breakdown Voltage: Greater than 1000 Volts AC RMS at 60 Hz.

Capacitance: Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 PF/FT at 1 Khz, depending on AWG and position.

Insulation Leakage: 100 Megohms/1000 feet minimum @ 500 VDC; from a conductor to all else in a cable, at 25°C.

U.L. Agency Voltage & Temperature Ratings: UL rated: + 80°C AWM, 300 VOLT per UL Style 2464. UL rated + 105°C CL2 TRAY CABLE per UL 13, NEC Type CL2.

Bending Characteristics: All cables are suitable for flexing to a circle diameter of 8 cable diameters from + 105°C to − 10°C. The flex diameter should be greater than 20 cable diameters for flexing at − 20°C.

Characteristic Impedance: RF Impedance of twisted pairs or adjacent singles is: 87 ohms in AWG 24; 80 ohms in AWG 22. Suitable for digital signals.

MULTI-CONDUCTOR STOCK CABLED PAIRS

Conductor sizes 24, 22 are 7 strand. All others 19 strand.

UNSHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NLP224J	2	24	.044	.032	.218	21
NLP324J	3	24	.044	.032	.230	26
NLP424J	4	24	.044	.032	.253	31
NLP524J	5	24	.044	.032	.279	37
NLP624J	6	24	.044	.032	.306	42
NLP724J	7	24	.044	.032	.292	46
NLP824J	8	24	.044	.032	.367	54
NLP924J	9	24	.044	.032	.350	60
NLP1024J	10	24	.044	.032	.367	64
NLP1224J	12	24	.044	.032	.379	73
NLP1524J	15	24	.044	.032	.429	88
NLP1924J	19	24	.044	.032	.442	106
NLP2724J	27	24	.044	.032	.529	144
NLP222J	2	22	.050	.032	.238	26
NLP322J	3	22	.050	.032	.252	33
NLP422J	4	22	.050	.032	.278	40
NLP522J	5	22	.050	.032	.308	47
NLP622J	6	22	.050	.032	.338	55
NLP722J	7	22	.050	.032	.323	61
NLP822J	8	22	.050	.032	.408	71
NLP922J	9	22	.050	.032	.388	79
NLP1022J	10	22	.050	.032	.408	85
NLP1222J	12	22	.050	.032	.422	97
NLP1522J	15	22	.050	.032	.478	118
NLP1922J	19	22	.050	.032	.493	143
NLP2722J	27	22	.050	.032	.628	221

OVERALL SHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NLP224FSJ	2	24	.044	.032	.220	22
NLP324FSJ	3	24	.044	.032	.232	27
NLP424FSJ	4	24	.044	.032	.255	32
NLP524FSJ	5	24	.044	.032	.281	38
NLP624FSJ	6	24	.044	.032	.308	44
NLP724FSJ	7	24	.044	.032	.294	48
NLP824FSJ	8	24	.044	.032	.369	55
NLP924FSJ	9	24	.044	.032	.352	61
NLP1024FSJ	10	24	.044	.032	.369	65
NLP1224FSJ	12	24	.044	.032	.381	74
NLP1524FSJ	15	24	.044	.032	.431	89
NLP1924FSJ	19	24	.044	.032	.444	107
NLP2724FSJ	27	24	.044	.032	.531	146
NLP222FSJ	2	22	.050	.032	.240	28
NLP322FSJ	3	22	.050	.032	.254	35
NLP422FSJ	4	22	.050	.032	.280	42
NLP522FSJ	5	22	.050	.032	.310	50
NLP622FSJ	6	22	.050	.032	.340	57
NLP722FSJ	7	22	.050	.032	.325	63
NLP822FSJ	8	22	.050	.032	.410	73
NLP922FSJ	9	22	.050	.032	.390	81
NLP1022FSJ	10	22	.050	.032	.410	87
NLP1222FSJ	12	22	.050	.032	.424	99
NLP1522FSJ	15	22	.050	.032	.480	120
NLP1922FSJ	19	22	.050	.032	.495	146
NLP2722FSJ	27	22	.050	.032	.630	223

NATIONAL WIRE
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TRAY CABLES
NEC 725

TWISTED PAIRS (NLP SERIES)

NEC UL LISTED CL 2

SIGNAL & CONTROL TRAY CABLES

MULTI-CONDUCTOR STOCK CABLED PAIRS

continued from previous page.

UNSHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NLP220J	2	20	.058	.032	.265	35
NLP320J	3	20	.058	.032	.281	45
NLP420J	4	20	.058	.032	.312	56
NLP520J	5	20	.058	.032	.346	68
NLP620J	6	20	.058	.032	.381	79
NLP720J	7	20	.058	.032	.364	89
NLP820J	8	20	.058	.032	.462	103
NLP920J	9	20	.058	.032	.439	115
NLP1020J	10	20	.058	.032	.462	124
NLP1220J	12	20	.058	.032	.478	144
NLP1520J	15	20	.058	.032	.544	176
NLP1920J	19	20	.058	.032	.561	216
NLP2720J	27	20	.058	.032	.711	326
NLP218J	2	18	.068	.032	.299	46
NLP318J	3	18	.068	.032	.318	61
NLP418J	4	18	.068	.032	.354	77
NLP518J	5	18	.068	.032	.394	94
NLP618J	6	18	.068	.032	.435	110
NLP718J	7	18	.068	.032	.415	124
NLP1218J	12	18	.068	.032	.549	203

OVERALL SHIELDED

Part No.	No. of Pairs	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O.D.	Weight LB/K ft.
NLP220FSJ	2	20	.058	.032	.267	39
NLP320FSJ	3	20	.058	.032	.283	49
NLP420FSJ	4	20	.058	.032	.314	60
NLP520FSJ	5	20	.058	.032	.348	72
NLP620FSJ	6	20	.058	.032	.383	83
NLP720FSJ	7	20	.058	.032	.366	93
NLP820FSJ	8	20	.058	.032	.464	107
NLP920FSJ	9	20	.058	.032	.441	119
NLP1020FSJ	10	20	.058	.032	.464	128
NLP1220FSJ	12	20	.058	.032	.480	148
NLP1520FSJ	15	20	.058	.032	.546	180
NLP1920FSJ	19	20	.058	.032	.563	220
NLP218FSJ	2	18	.068	.032	.301	52
NLP318FSJ	3	18	.068	.032	.320	67
NLP418FSJ	4	18	.068	.032	.356	83
NLP518FSJ	5	18	.068	.032	.396	99
NLP618FSJ	6	18	.068	.032	.437	116
NLP718FSJ	7	18	.068	.032	.417	130
NLP1218FSJ	12	18	.068	.032	.551	209

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SIGNAL & CONTROL TRAY CABLES

NEC 725 TRAY CABLES "PLTC"

STANDARD PLTC CABLES

UL RATED: 300 VOLTS, 105°C.

NEC UL LISTED PLTC

PAIRS:

PLTC UNSHIELDED **PAIR** CABLE				PLTC FOIL-SHIELDED **PAIR** CABLE			
PART NO.	**COND.**	**AWG**	**DIAM. INCHES**	**PART NO.**	**COND.**	**AWG**	**DIAM. INCHES**
NG222J	2	22	.170	NG222FSJ	2	22	.176
NG220J	2	20	.190	NG220FSJ	2	20	.196
NG218J	2	18	.206	NG218FSJ	2	18	.212
NG216J	2	16	.220	NG216FSJ	2	16	.226

TRIOS:

PLTC UNSHIELDED **TRIO** CABLE				PLTC FOIL-SHIELDED **TRIO** CABLE			
PART NO.	**COND.**	**AWG**	**DIAM. INCHES**	**PART NO.**	**COND.**	**AWG**	**DIAM. INCHES**
NG322J	3	22	.179	NG322FSJ	3	22	.185
NG320J	3	20	.200	NG320FSJ	3	20	.206
NG318J	3	18	.218	NG318FSJ	3	18	.224
NG316J	3	16	.233	NG316FSJ	3	16	.239

PLTC CABLE CONSTRUCTION:

ALL PLTC CABLES USE 0.012″ (min.) WALL OF 105°C PVC WIRE INSULATION, PLUS AN OVERALL 0.032″ WALL OF SPECIAL FLAME-SPREAD-RESISTANT BLACK PVC JACKET.

U.L. LISTED AS SUNLIGHT-RESISTANT "PLTC" TRAY CABLE.
(PLTC is abbreviation of NEC "POWER-LIMITED TRAY CABLE")

RELATIVE PERFORMANCE:

THE NATIONAL PLTC CABLES ARE **VERY** SIMILAR IN PERFORMANCE TO THE NATIONAL "NQ" FAMILY OF FLEXIBLE CABLES.

STANDARD PUTUP: 500 FT. REELS (NON RETURNABLE REELS)
STANDARD COLORS: PAIRS; BLACK & RED. TRIOS; BLACK, RED, WHITE. MANY OTHER **PLTC** CONSTRUCTIONS CAN BE MADE TO ORDER. CONSULT FACTORY FOR OTHER LARGER "PLTC" CABLES.

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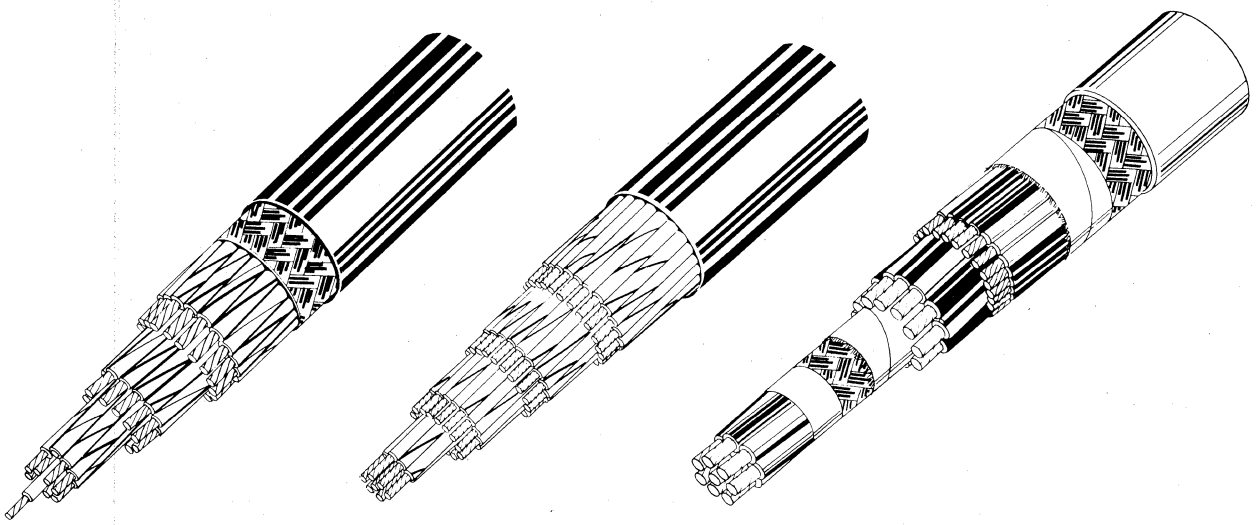
CUSTOM-MADE CABLE TO YOUR OWN SPECIFICATIONS....



COMPLETE WIRE AND CABLE FACILITIES TO MEET YOUR NEEDS

If the standard cables shown on the preceeding pages do not meet your application requirements, Custom-Made cables to your own specifications are available promptly—and at lower cost than you may suppose . . . **including cables or cable assemblies with both copper conductors, and optical fiber components.**

BECAUSE NATIONAL HAS:

1- The organization & experience to handle short-runs or rush schedules with consistent quality.

2- All types of mill machinery for fabricating cable and all intermediate operations.

3- An enormous wire inventory to draw from for material for your cable. Over 200 million feet of our own manufacture in stock.

4- Technical consultants to aid you in properly specifying your cable needs.

Mr. DESIGNER: May we suggest:

A- Ask our nearest representative for his assistance and for our larger "Engineers & Designers Master Catalog". His name and address is shown on inside back cover.

B- Call our engineering department (213-225-5611) and discuss your needs with our technical consultants. They understand your problem and may have just the answers you need.

C- Our consultants will assist you in design, obtain cost and delivery information, provide formal quotations and drawings, and assist with sales & procurement liaison.

D- On most custom cables, we can print your company name and part number at regular intervals on the outside jacket at no extra cost. This will make your packaging truly "Custom".

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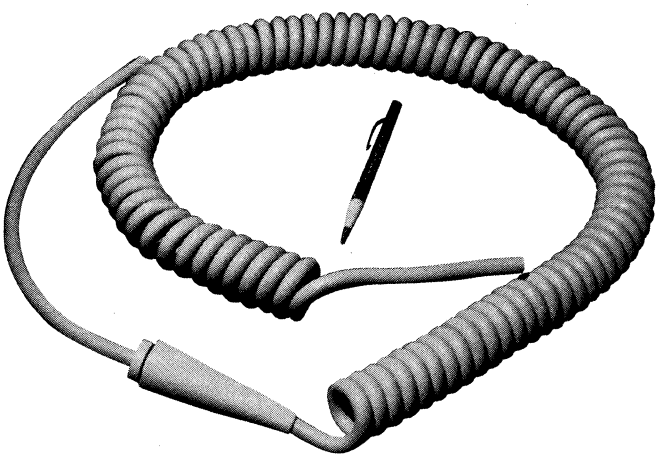
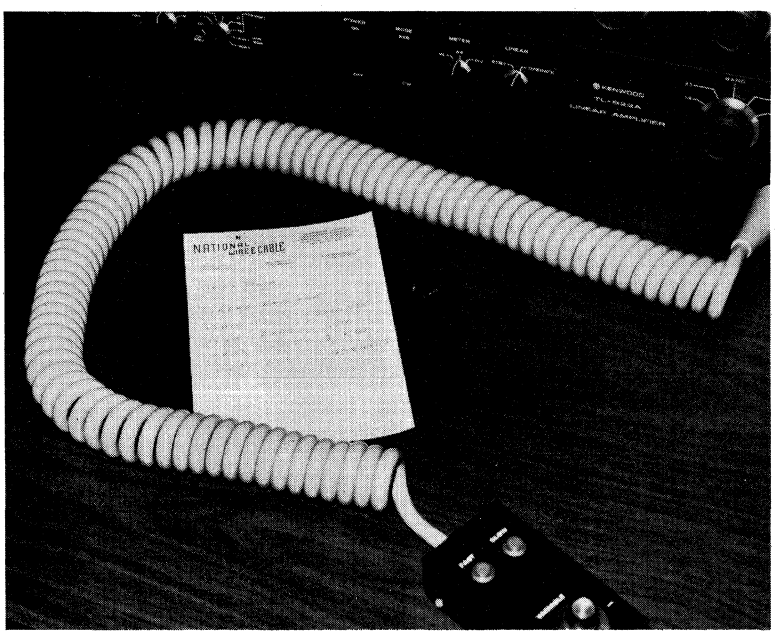
Coiled Instrumentation Cables for Custom Applications



Our new, automated coiling department is ready to design, and manufacture coiled instrumentation cables for your specific requirements. These cables are available in any number of conductors, and in gauge sizes 18 through 30 AWG. They are designed for high reliability, ultra-flexible long-life applications, as encountered in computer interconnects, bio-medical electronics, and optimum retractability, and general control cable use. Call our technical staff to discuss your custom application!



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NATIONAL CABLE MOLDING CORPORATION

AN AFFILIATE OF NATIONAL WIRE & CABLE CORPORATION

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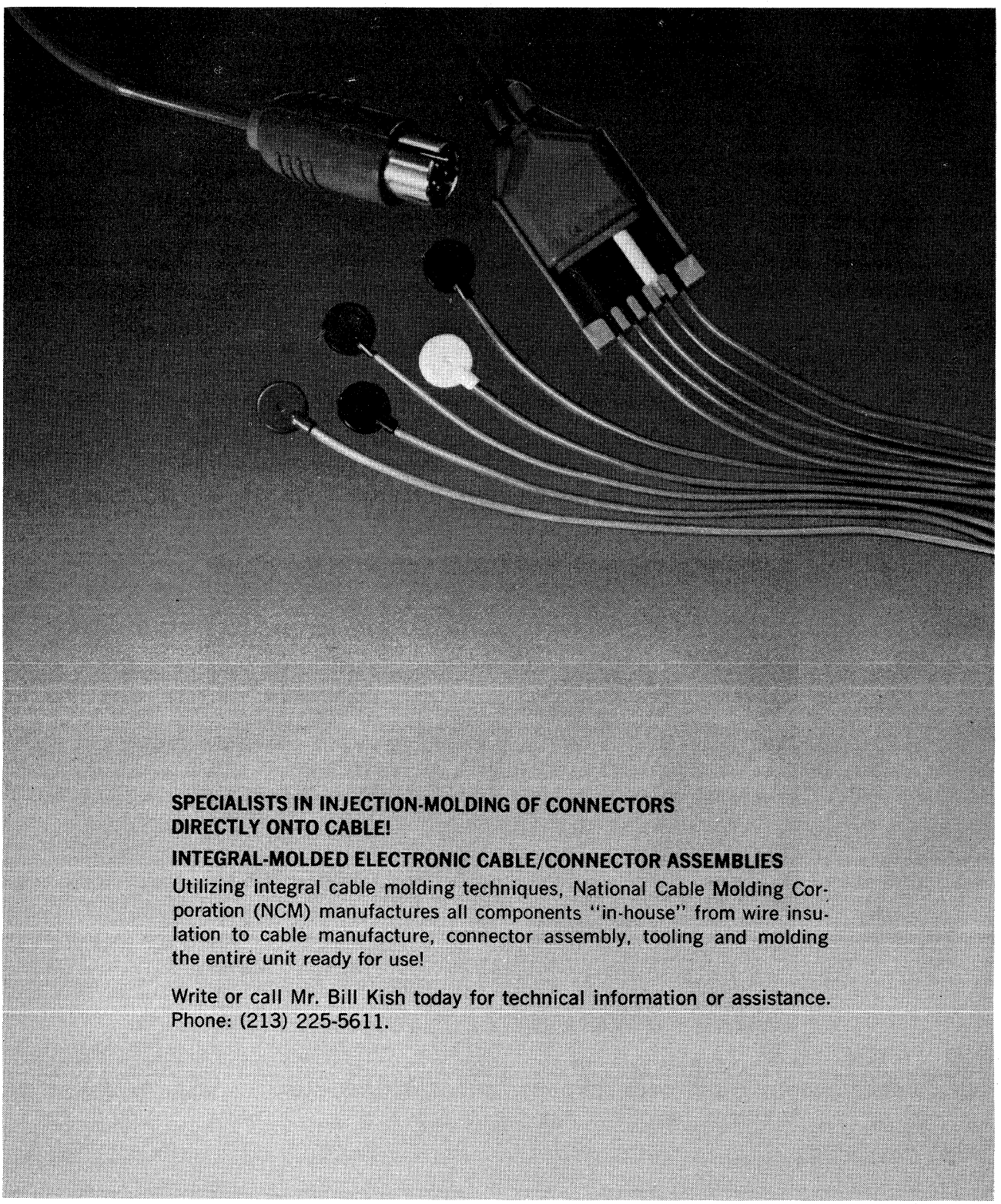
Molded Instrumentation Cables for all Types of Medical & Electronic Applications



SPECIALISTS IN INJECTION-MOLDING OF CONNECTORS DIRECTLY ONTO CABLE!

INTEGRAL-MOLDED ELECTRONIC CABLE/CONNECTOR ASSEMBLIES

Utilizing integral cable molding techniques, National Cable Molding Corporation (NCM) manufactures all components "in-house" from wire insulation to cable manufacture, connector assembly, tooling and molding the entire unit ready for use!

Write or call Mr. Bill Kish today for technical information or assistance. Phone: (213) 225-5611.

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✓ ***OMEGA® Features:***
Uninsulated Base Metal Thermocouple Wire from .0005 to .032 inch diameters

✓ ***Insulated Duplex Thermocouple Wire—Insulations Include:***

- ***Polyvinyl***
- ***Nylon***
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✓ ***Metal Clad Thermocouple Cable 304 SS and Inconel 600 OMEGACLAD™ in Diameters from .010 to .250***

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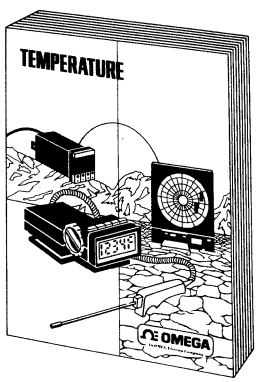

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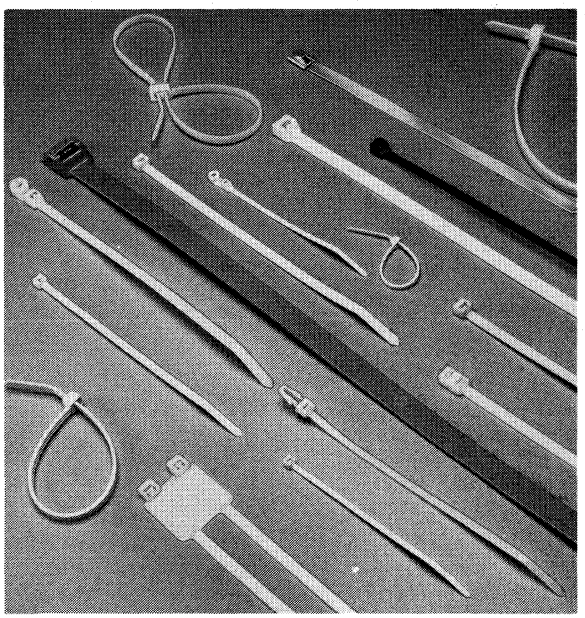
PANDUIT® WIRING PRODUCTS

CABLE TIES
Designed to increase productivity and reduce total installed cost

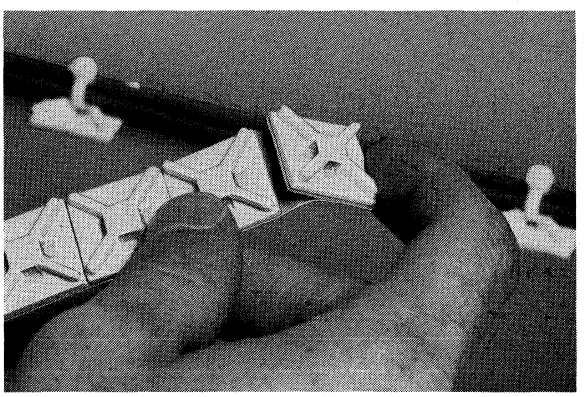


The Largest Selection of Sizes, Styles, Colors and Materials
■ For bundle diameters up to 13″ ■ Locking and releaseable styles ■ Low threading force ■ Finger grip tip ■ No sharp edges ■ Bent tip ■ Choose from nylon, polypropylene or fluoropolymers to meet application environments ■ Choose the color to blend in with the application ■ Meet all applicable military and U.L. specifications.

Clamp Ties
Flexible head permits mounting *before* wire installation. Eliminates the need for inventory of various fixed diameter clamps.

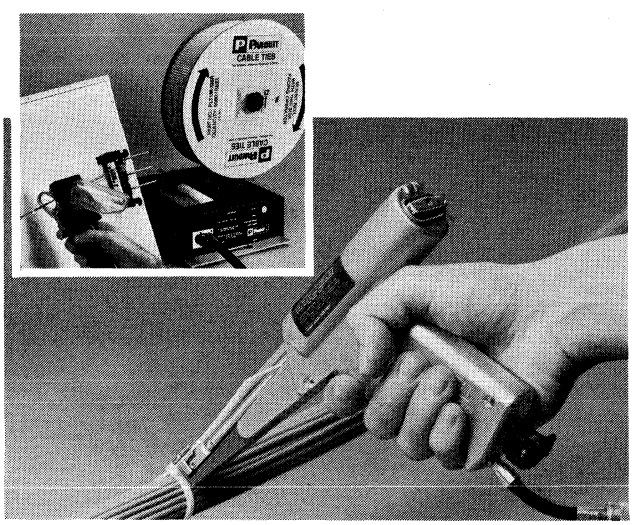
Push Mount Ties
Available in two styles. Integral mounting device eliminates need for separate mounting hardware. For bundle diameters to 1¾″ and panel thicknesses to .125″.

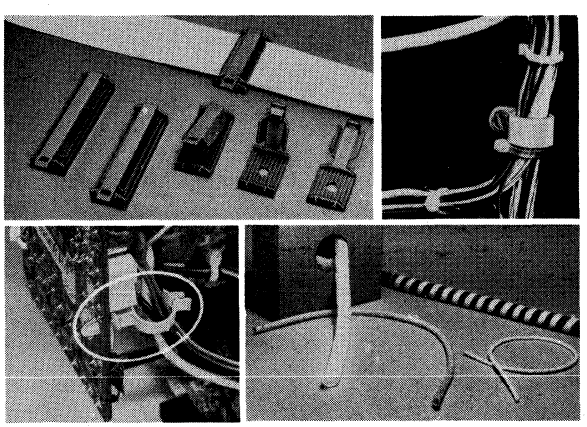
Marker Ties
Clean, permanent identification of wire bundles and harnesses. Convenient, marker and tie in one.



Mounting Accessories
The largest selection used with or without cable ties— adhesive backed mounts, tie mounts, tie anchors, low profile mounts, control panel mounts, adhesive backed cord clips, fixed diameter clamps, flat cable mounts, flat cable clips in wide range of sizes. Most are U.L. recognized.

Cable Tie Installation Tools
Complete line of tooling, from simple hand tools to semi-automatic and automatic installation equipment, including systems designed for robotics applications.





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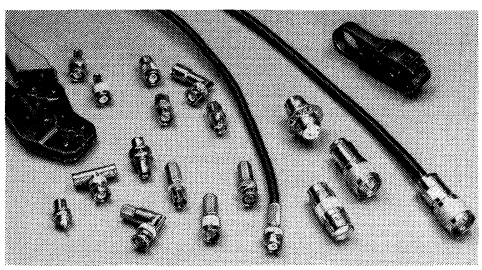
PANDUIT® WIRING PRODUCTS

PAN-CODE™ Wire and Identification Markers

Crisp legends—complete line—proven service

- Wire markers available in vinyl cloth, vinyl polyester, aluminum or acetate, on dispenser cards with full or half sizes, in a large variety of legends.
- EDP printable labels for in-house custom capability. A large selection of sizes, materials and colors. Software is available for faster label design and greater productivity.
- Custom markers—any legend, size or color to meet your specific requirements.

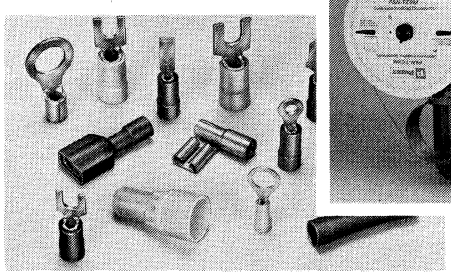
Coax Connectors

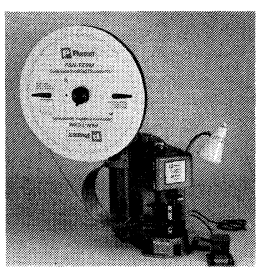


Designed to provide fast, reliable connections

- Twist-on, wedge clamp and crimp types
- BNC, TNC or Twinax
- Coax sizes RG-58, 59 or 62/U and industry standard Twinax
- Plugs, jacks, adapters and receptacles
- Individually packaged for convenient storage and use
- Stripping and crimping tools

PAN-TERM® Terminals





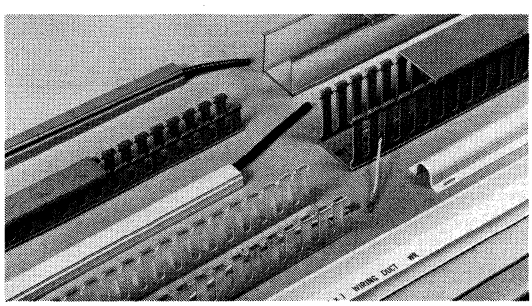
- Complete line of terminals, disconnects, splices and wire joints for #26 through #2 AWG wire
- Funnel entry available on most terminals and disconnects to speed assembly
- Electrolytically refined copper for optimum crimping, low resistance and high conductivity
- All applicable sizes UL listed and CSA certified and meet MIL specs

Continuously Molded Terminals and Disconnects

For high volume production, terminals and disconnects furnished on reels

- TERMO™ continuously molded, barrel insulated terminals
- DISCO™ continuously molded, barrel and fully insulated disconnects
- Guaranteed alignments due to molded-in carrier strip
- Color coded insulation speeds wire size identification and die selection
- One state-of-the-art applicator terminates the entire TERMO/DISCO line of over 250 parts. This virtually eliminates downtime because of parts changeover.

PANDUCT® Plastic Wiring Duct



The number one name in wiring duct—the largest selection of sizes, styles, colors and materials.

- Type "E" features snap-in slot design to hold break-out wires and assure complete accessibility
- Complete line of accessories available for installation
- Universal mounting holes for maximum design and layout flexibility
- Standard color: light gray; white and dark gray available
- Also available: Type "S" solid wall duct
  Type "D" round hole duct
  Type "NE" & "NS" chlorine-free high temperature duct
  Type "PE" & "PS" clear polycarbonate high temperature duct

  and . . . matching non-slip covers for all styles.

Plus a complete line of surface raceway.

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International & North American Cords & Cordsets

Designing for Export—Important Considerations

There are three important technical hurdles facing the designer of equipment that will be exported:

- the product must be easily connected to foreign mains power outlets or wall sockets.
- the product must work at foreign mains voltages and frequencies which range from 100-250VAC at 50 or 60Hz. European voltages are typically 220 at 50 Hz. (See our power inlet modules with integral voltage selectors in Section 2100.)
- the product must conform to foreign product safety standards as enforced by appropriate national standards and test agencies.

Note that products being shipped to Europe—and almost everywhere outside of North America—must utilize Harmonized cordage manufactured to CENELEC standards HD-21 (for PVC jacketed cordage) or HD-22 (rubber jacketed). Harmonized cordage differs from North American AWG cordage in several ways. The main differences are:

- Primary insulation color coding on Harmonized cordage is brown–line, blue–neutral, yellow-green–ground (North American color coding is black–line; white–neutral; green–ground).
- Harmonized wire sizes are expressed in metric units (North American wire sizes are expressed in AWG). Some of the common power cordage wire sizes are noted below:

AWG	Closest Metric Equiv.	Max. Current
18 AWG	0.75mm²	6A
16 AWG	1.00mm²	10A
14 AWG	1.50mm²	16A

Specifying International and North American Power Connections (see options at right)

1. **Detachable cordsets** based on IEC 320 connector system. Benefit: Flexibility. The IEC 320 power inlet (installed on product) and outlet (on cordset) allows the manufacturer to attach a cordset with the correct international or North American wall plug just before shipment. Current ratings are limited to 6 or 10 amps by European agencies. IEC 320 standard sheets C19 & C20 permit detachable power connections rated at 16 amps—PCC offers several standard high-power cordsets—see the pages which follow for more information.

2. **IEC 320 cord with Harmonized or SJT cordage and no plug:** Ready for attachment of correct overseas or NEMA plug—when small export volume does not justify stocking different cordsets.

3. **Power Supply Cords:** Permanently installed cords are usually specified when your equipment requires more than 10A. For applications rated at 10-16 amps, 1.5mm² (cp. 14AWG) conductors are specified.

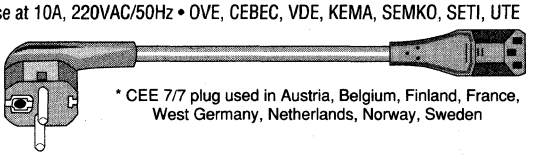
4. **Made-to-Order Cord & Cordset Assemblies:** Specify a made-to-order assembly when standard model is not available or when special end preparations are required.

5. **Cordage:** When neither a molded power supply cord nor cordset is suitable, international or North American cordage with appropriately sized conductors may be the best alternative. (See last page of Panel Components' ads in this section for cordage.)

Detachable Cordsets (with IEC 320 connector)

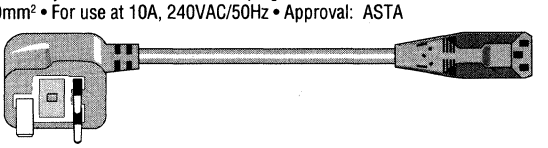
Cordsets are black; 2.5 meters (98.4 inches, ± 4") long. Designer's Kit of International Cordsets (Part #86599010) includes these cordsets:

CONT. EUROPE, #86512050: CEE 7/7 plug • Conductor Size: 1.00mm² • For use at 10A, 220VAC/50Hz • OVE, CEBEC, VDE, KEMA, SEMKO, SETI, UTE

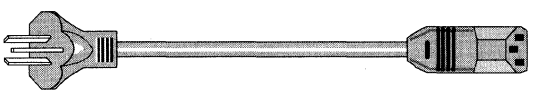


* CEE 7/7 plug used in Austria, Belgium, Finland, France, West Germany, Netherlands, Norway, Sweden

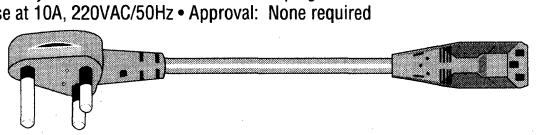
BRITISH, #86552005: BS-1262 plug with 13A fuse • Conductor Size: 3 x1.00mm² • For use at 10A, 240VAC/50Hz • Approval: ASTA



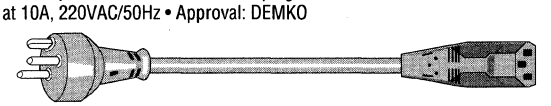
AUSTRALIAN, #86516033: AS 3112 plug • Conductor Size: 3 x1.00mm² • For use at 10A, 240VAC/50Hz • Approvals: SECV, Telecom



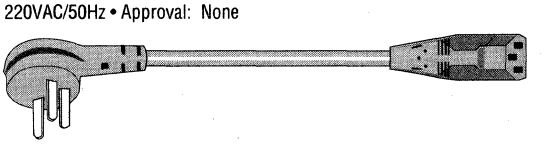
INDIAN, #86559011: Old Brit. BS 546 plug • Conduct. Size: 3 x 1.00mm² • For use at 10A, 220VAC/50Hz • Approval: None required



DANISH, #86536041: Afsnit 107 plug • Conductor Size: 3 x 1.00mm² • For use at 10A, 220VAC/50Hz • Approval: DEMKO

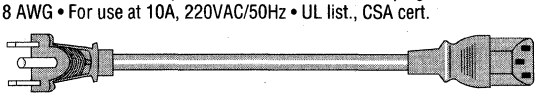


ISRAELI, #86558010: SI 32 plug • Conductor Size: 3 x 0.75mm² • For use at 6A, 220VAC/50Hz • Approval: None

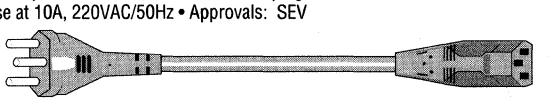


ITALIAN, #86531031: CEI 23-16/VII plug • Conductor Size: 3 x 1.00mm² • For use at 10A, 220VAC/50Hz • Approvals: IMQ

NORTH AMERICAN, #86537030: NEMA 5-15P plug • Conductor Size: 3 x 18 AWG • For use at 10A, 220VAC/50Hz • UL list., CSA cert.



SWISS, #86515050: SEV 1011.1959 plug • Conductor Size: 3 x 1.00mm² • For use at 10A, 220VAC/50Hz • Approvals: SEV



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Unterminated IEC 320 Cords

Ready for attachment of correct North American or overseas plug. Cords are black; 2.5 meters (98.4", ± 4"); stripped 50mm jacket; 5mm conductors. Call for availability of plugs.

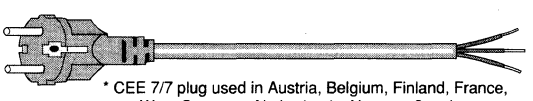
INTERNATIONAL, #86525050: Utilizing Harmonized Cordage • Conductor Size: 1.00mm² • For use at 10A, 220-240VAC/50Hz • OVE, CEBEC, VDE, KEMA, NEMKO, SEMKO, SETI, SEV, UTE

NORTH AMERICAN, #86525032: Utilizing SJT Cordage • Conductor Size: 3 x 18 AWG • For use at 10A, 120VAC/60Hz • UL recog., CSA cert.

International Power Supply Cords

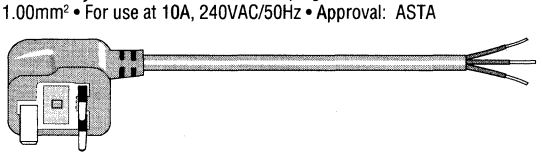
Permanently installed for loads of 10A or more. Cords are black; 2.5 meters (98.4", ± 4") long; stripped 50/5mm.

CONT. EUROPE, #86517030: CEE 7/7 plug* • Conductor Size: 3 x 1.00mm² • For use at 10A, 220VAC/50Hz • Approvals: OVE, CEBEC, VDE, KEMA, SEMKO, SETI, UTE

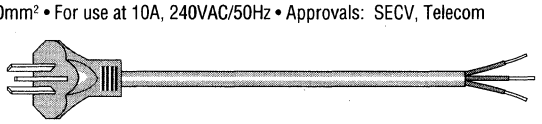


* CEE 7/7 plug used in Austria, Belgium, Finland, France, West Germany, Netherlands, Norway, Sweden

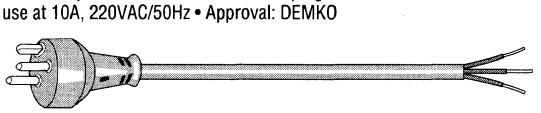
BRITISH, #86552005: BS-1262 plug with 13A fuse • Conductor Size: 3 x 1.00mm² • For use at 10A, 240VAC/50Hz • Approval: ASTA



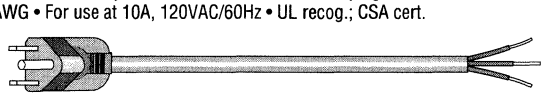
AUSTRALIAN, #86516033: AS 3112 plug • Conductor Size: 3 x 1.00mm² • For use at 10A, 240VAC/50Hz • Approvals: SECV, Telecom



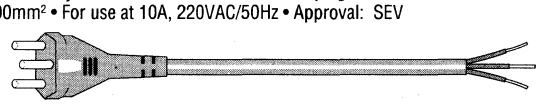
DANISH, #86536041: Afsnit 107 plug • Conductor Size: 3 x 1.00mm² For use at 10A, 220VAC/50Hz • Approval: DEMKO



NO. AMER., #86590040: NEMA 5-15P plug • Conductor Size: 3 x 18AWG • For use at 10A, 120VAC/60Hz • UL recog.; CSA cert.



SWISS, #86515050: SEV 1011.1959 plug • Conductor Size: 3 x 1.00mm² • For use at 10A, 220VAC/50Hz • Approval: SEV



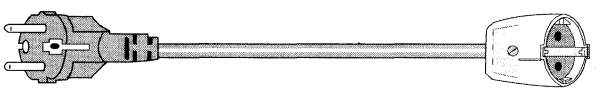
Made-to-Order Cords & Cordsets

In-house, made-to-order assembly services are available for requirements such as special lengths, plug and connector assemblies, special end preparation (e.g., custom cut and strip requirements, solderless terminals), labeling, packaging, coiling, hanking.

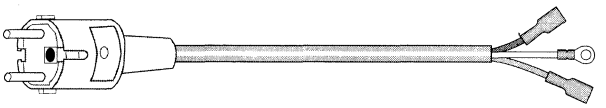
We specialize in short runs (100-1000 pieces) with quick turnarounds and no minimum order. The following cords and cordsets are examples of our made-to-order capabilities; call for more information.

CONT. EUROPEAN CORDSET, #868014--: With Angled Connector • For use at 10A, 220VAC/50Hz • Specify length to 8.2' max.

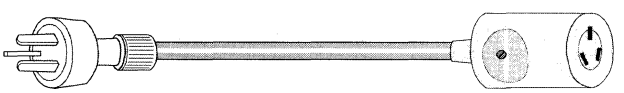
CONT. EUROPEAN EXTENSION CORD, #868273--: For use at 16A, 220VAC/50Hz • Specify length to 8.2' max.



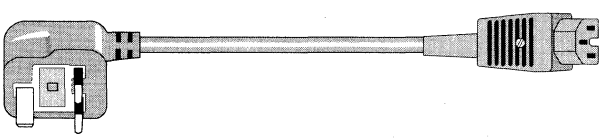
CONT. EUROPEAN CORD, #868676--: With crimp terminals • For use at 16A, 220/50Hz • Specify length to 50' max.



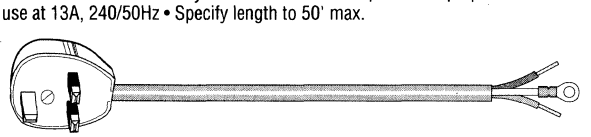
AUSTRALIAN EXTENSION CORD, #868284--: For use at 10A, 240VAC/50Hz • Specify length: 1.0' min. to 50' max.



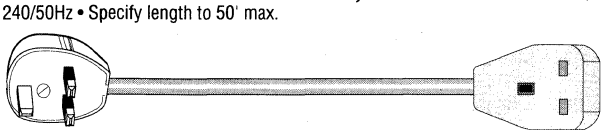
BRITISH CORDSET RATED AT 10A, #868676--: With straight connector • For use at 10A, 240/50Hz • Specify length to 8.2' max.



BRITISH CORD, #869040--: With special end preparation • For use at 13A, 240/50Hz • Specify length to 50' max.



BRITISH EXTENSION CORD, #868676--: For use at 13A, 240/50Hz • Specify length to 50' max.



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INTERNATIONAL power components • see also Sec. 2100 (Connectors) • 4050 (Int'l. Power Source) • 4300 (Fuses)

European High Power Connections

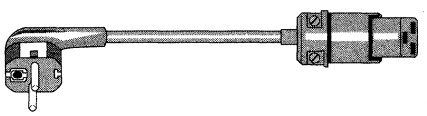
The single-phase cords and cordsets below use standard international cords with detachable IEC 320 connectors and/or plugs & inlets based on IEC 309. The 3-phase cords and cordsets below utilize only IEC 309 connectors. IEC 309 is an international standard which defines a power connection system for use at high voltages—from 16-125A at 50Hz in Europe. Detachable power connection systems are particularly useful where a piece of equipment must be moved from workstation to workstation. IEC 309 connectors are designed to eliminate mismating of connectors of different amperages and voltage ratings through unique key/keyway, pin patterns and connector sizes. Mating inlet and outlet connectors are also available from Panel Components Corporation.

Single Phase Connections

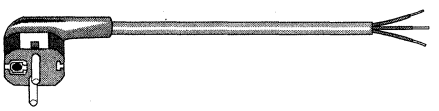
16A/220-240VAC (50 Hz)

Cordsets | Cords

#868007--: Cont. European CEE 7/7 plug, 3 x 1.50mm² Harmonized PVC jacketed cordage, IEC 320/C19 rewirable connector. Approvals on power cord: VDE, OVE, SEMKO, NEMKO, SETI, CEBEC, KEMA; on connector: TUV, VDE.



#868521--: Cont. European CEE 7/7 plug, 3 x 1.50mm² Harmonized PVC jacketed cordage. Approvals: VDE, OVE, SEMKO, NEMKO, SETI, CEBEC, KEMA.

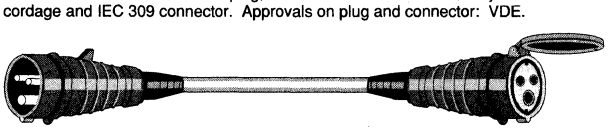


#87510010:* IEC 309 plug, 3 x 1.50mm² Harmonized PVC jacketed cordage and IEC 320/C19 connector. Approvals on plug: VDE, OVE, DEMKO, SEMKO, SEV. Approval on connector: TUV, VDE

#87510020:* IEC 309 plug, 3 x 1.50mm² Harmonized PVC jacketed cordage. Approval on plug: VDE, OVE, DEMKO, SEMKO, SEV.

32A/220-240VAC (50 Hz)

#87520010:* IEC 309 plug, 3 x 4.0mm² Harmonized rubber jacketed cordage and IEC 309 connector. Approvals on plug and connector: VDE.



#87520020:* IEC 309 plug, 3 x 4.0mm² Harmonized rubber jacketed cordage. Approvals on plug: VDE.

3-Phase Connections

32A/380-415VAC (50 Hz)

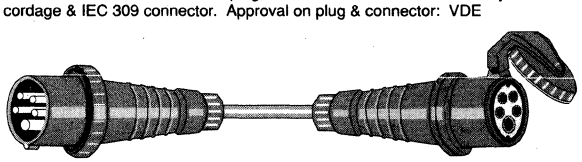
Cordsets | Cords

#87530010:* IEC 309 plug, 5 x 4.0mm² Harmonized rubber jacketed cordage and IEC 309 connector. Approvals on plug and connector: VDE, OVE, DEMKO, SETI, KEMA, NEMKO, SEMKO, SEV.

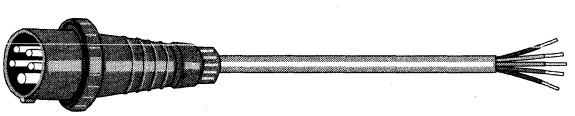
#87530020:* IEC 309 plug, 5 x 4.0mm² Harmonized rubber jacketed cordage. Approvals on plug: VDE, OVE, DEMKO, SETI, KEMA, NEMKO, SEMKO, SEV.

63A/380-415VAC (50 Hz)

#87540010:* IEC 309 plug, 5 x 10.0mm² Harmonized rubber jacketed cordage & IEC 309 connector. Approval on plug & connector: VDE



#87540020:* IEC 309 plug, 5 x 10.mm² Harmonized rubber jacketed cordage. Approvals on plug: VDE



***Mating panel-mount outlets & in-line connectors also available**

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INTERNATIONAL power components • see also Sec. 2100 (Connectors) • 4050 (Int'l. Power Source) • 4300 (Fuses)

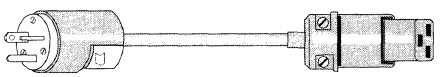
North American High Power Connections

The single-phase cords and cordsets below use either standard NEMA-type plugs with detachable IEC 320 connectors or plugs & inlets based on IEC 309. The 3-phase cords and cordsets below utilize only IEC 309 connectors. IEC 309 is an international standard which defines a power connection system for use at high amperages—from 20-100A at 60Hz in North America. Detachable power connection systems are particularly useful where a piece of equipment must be moved from workstation to workstation. IEC 309 connectors are designed to eliminate mismating of connectors of different amperages and voltage ratings through unique key/keyway, pin patterns and connector sizes. Mating inlet and outlet connectors are also available from Panel Components Corporation.

Single Phase Connections

Cordsets — 20A/120VAC (60 Hz) — Cords

Part #868218--:* NEMA 5-20 plug, SJT 12/3 (PVC jacketed) cordage, IEC 320/C19 rewirable connector. Plug, cordage & connector: UL recog., CSA cert.



Part #870201--:* NEMA 5-20 plug, SJT 12/3 (PVC jacketed) cordage. Plug & cordage are UL recognized, CSA certified.

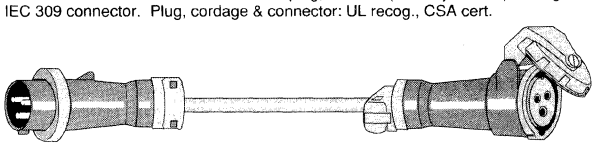
20A/230VAC (60 Hz)

Part #868222--:* NEMA 6-20 plug, SJT 12/3 (PVC jacketed) cordage, IEC 320/C19 rewirable connector. Plug, cordage & connector: UL recog., CSA cert.

Part #870313--: * NEMA 6-20 plug, SJT 12/3 cordage (PVC jacketed). Plug & cordage are UL recognized, CSA certified.

30A/230VAC (60 Hz)

Part #87530210:* IEC 309 plug, SO 10/3 (rubber jacketed) cordage, IEC 309 connector. Plug, cordage & connector: UL recog., CSA cert.

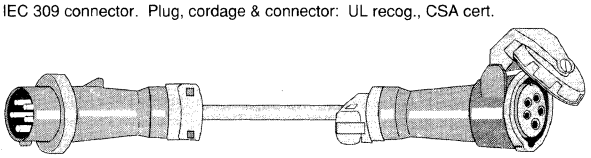


Part #87530220:* IEC 309 plug, SO 10/3 (rubber jacketed) cordage. Plug, cordage and connector: UL recognized, CSA certified.

3-Phase Connections

Cordsets — 30A/208VAC (60 Hz) — Cords

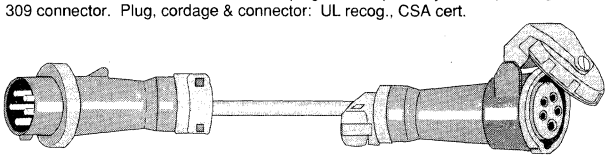
Part #87540110:* IEC 309 plug, SO 10/5 (rubber jacketed) cordage, IEC 309 connector. Plug, cordage & connector: UL recog., CSA cert.



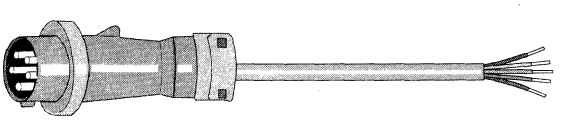
Part #87540120:* IEC 309 plug, SO 10/5 (rubber jacketed) cordage. Plug and cordage: UL recognized, CSA certified.

60A/208VAC (60 Hz)

Part #87540210:* IEC 309 plug, SO 4/5 (rubber jacketed) cordage, IEC 309 connector. Plug, cordage & connector: UL recog., CSA cert.



Part #87540220:* IEC 309 plug, SO 4/5 (rubber jacketed) cordage. Plug and cordage: UL recognized, CSA certified.



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INTERNATIONAL power components • see also Sec. 2100 (Connectors) • 4050 (Int'l. Power Source) • 4300 (Fuses)

International & North American Cordage

Products being shipped to Europe—and almost everywhere outside of North America—must utilize Harmonized cordage manufactured to CENELEC standard HD-21 (for PVC jacketed cordage) or HD-22 (rubber jacketed). Harmonized cordage differs from North American AWG cordage in several ways:

- Primary insulation color coding: Harmonized cordage: brown–line, blue–neutral, yellow-green–ground (North American: black–line, white–neutral, green–ground).
- Harmonized wire sizes are expressed in metric units (North American wire sizes are expressed in AWG). Some of the common power cordage wire sizes are noted below.

AWG	Closest Metric Equivalent	Max. Current
18 AWG	0.75mm²	6A
16 AWG	1.0mm²	10A
14 AWG	1.50mm²	16A

Most cordage models below are available from stock.

Harmonized Cordage

International color coding: Brown (line), Blue (neutral), and Yellow/Green (Ground)

3-Wire Cordage

(for single phase applications)

PVC Jacketed

Part Number	Size	O.D.	Color	HD-21 Code
86010013	3x0.75mm²	6.8mm	Black	H05VVF3G0.75
86010043	3x1.00mm²	7.2mm	Black	H05VVF3G1.00
86010073	3x1.50mm²	8.3mm	Black	H05VVF3G1.50
86010123	3x2.50mm²	10.2mm	Black	H05VVF3G2.50

Rubber Jacketed

Part Number	Size	O.D. (mm)	Color	HD-22 Code
86010380	3x1.50mm²	9.6-12.5	Black	H07RNF3G1.50
86010390	3x2.50mm²	11.5-14.5	Black	H07RNF3G2.50
86010400	3x4.00mm²	13.0-16.0	Black	H07RNF3G4.00

5-wire Cordage

(for 3-phase applications)

PVC Jacketed

Part Number	Size	O.D.	Color	HD-21 Code
86010311	5x0.75mm²	8.3mm	Black	H05VVF5G0.75
86010331	5x1.00mm²	8.8mm	Black	H05VVF5G1.00
86010351	5x1.50mm²	10.4mm	Black	H05VVF5G1.50
86010371	5x2.50mm²	12.4mm	Black	H05VVF5G2.50

Rubber Jacketed

Part Number	Size	O.D. (mm)	Color	HD-22 Code
86010410	5x2.50mm²	13.5-17.0	Black	H07RNF5G2.5
86010420	5x4.00mm²	16.0-19.5	Black	H07RNF5G4.0
86010430	5x6.00mm²	18.0-24.5	Black	H07RNF5G6.0
86010440	5x10.00mm²	24.0-30.5	Black	H07RNF5G10.0
86010490	5x16.0mm²	27.0-35.5	Black	H07RNF5G16.0

North American Cordage

North American color coding: Black (line), White (neutral), and Green (Ground)

3-Wire Cordage

(for single phase applications)

PVC Jacketed

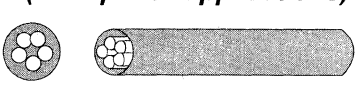
Part Number	Size	O.D.	Color	Cordage Type
86010450	3x18 AWG	.325"	Black	SJT
86010460	3x16 AWG	.345"	Black	SJT
86010470	3x14 AWG	.378"	Black	SJT
86010480	3x12 AWG	.445"	Black	SJT

Rubber Jacketed

Part Number	Size	O.D.	Color	Cordage Type
86010600	3x14 AWG	.560"	Black	SO
86010610	3x12 AWG	.630"	Black	SO
86010620	3x10 AWG	.690"	Black	SO

5-wire Cordage

(for 3-phase applications)



Rubber Jacketed

Part Number	Size	O.D.	Color	Cordage Type
86010660	5x10 AWG	.830"	Black	SO
86010670	5x8 AWG	–	Black	SO
88010690	5x4 AWG	–	Black	SEO
86010710	5x1/0 AWG	–	Black	SEO

Aso available: Low-Leakage SJT 3-wire cordage for medical applications (SJT).

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Catalog Number	AWG Size	Bare Conductor Diameter	Stranding	Insulation Wall Thickness		Insulated Wire Diameter		
				Minimum	Maximum	Minimum	Nominal	Maximum
30738MHW	30	.0120	7/38	.0029	.0039	.0178	.0188	.0198
301040MHW	30	.0114	10/40	.0029	.0039	.0172	.0182	.0192
301942MHW	30	.0125	19/42	.0029	.0039	.0183	.0193	.0203
302544MHW	30	.0115	25/44	.0029	.0039	.0173	.0183	.0193
304046MHW	30	.0117	40/46	.0029	.0039	.0175	.0185	.0195
32740MHW	32	.0093	7/40	.0025	.0035	.0143	.0153	.0163
321944MHW	32	.0100	19/44	.0022	.0036	.0154	.0163	.0172
322546MHW	32	.0093	25/46	.0025	.0035	.0143	.0153	.0163
326450MHW	32	.0093	64/50*	.0025	.0035	.0143	.0153	.0163
34540MHW	34	.0078	5/40	.0025	.0032	.0128	.0135	.0142
34742MHW	34	.0075	7/42	.0024	.0030	.0123	.0129	.0135
341044MHW	34	.0073	10/44	.0022	.0028	.0121	.0127	.0133
341646MHW	34	.0074	16/46	.0023	.0029	.0122	.0128	.0134
341946MHW	34	.0080	19/46	.0024	.0032	.0129	.0137	.0145
344050MHW	34	.0073	40/50*	.0022	.0028	.0121	.0127	.0133
36340MHW	36	.0061	3/40	.0015	.0025	.0093	.0102	.0111
36744MHW	36	.0060	7/44	.0015	.0025	.0092	.0101	.0110
361046MHW	36	.0059	10/46	.0015	.0025	.0091	.0100	.0109
362550MHW	36	.0058	25/50*	.0015	.0025	.0090	.0099	.0109
38444MHW	38	.0046	4/44	.0017	.0021	.0080	.0084	.0088
38746MHW	38	.0048	7/46	.0017	.0021	.0082	.0086	.0090
381650MHW	38	.0046	16/50*	.0017	.0021	.0080	.0084	.0088
401050MHW	40	.0037	10/50*	.0015	.0017	.0067	.0069	.0071
42650MHW	42	.0031	6/50*	.0013	.0015	.0057	.0059	.0061

*Bare Copper Conductor

TDQ
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For greater economy, but still retaining all the features of our MHW (with the exception of less flexibility) try our TDQ Wire. Bare Copper or Silver Plated Copper Conductor standard. Conductor of your choice may also be used.

Catalog Number	AWG Size	Bare Conductor Diameter	Insulation Wall Thickness		Insulated Wire Diameter		
			Minimum	Maximum	Minimum	Nominal	Maximum
24TDQ	24	.0201	.0035	.0049	.0269	.0285	.0301
26TDQ	26	.0159	.0032	.0045	.0222	.0236	.0251
28TDQ	28	.0126	.0029	.0039	.0183	.0194	.0206
30TDQ	30	.0100	.0027	.0036	.0153	.0163	.0173
32TDQ	32	.0080	.0025	.0032	.0129	.0137	.0145
34TDQ	34	.0063	.0021	.0027	.0104	.0111	.0118
36TDQ	36	.0050	.0019	.0023	.0087	.0092	.0097
38TDQ	38	.0040	.0016	.0019	.0071	.0075	.0079
40TDQ	40	.0031	.0013	.0015	.0056	.0059	.0062
42TDQ	42	.0025	.0010	.0012	.0044	.0047	.0050
44TDQ	44	.0020	.0009	.0011	.0037	.0040	.0043

MFC
MULTICONDUCTOR MICROMINIATURE AND SUBMINIATURE FLAT CABLES
GAUGES: 24—44

Servicing... ELECTRONICS MEDICAL PACKAGING

Specializing in the application of less than .00025" to over .006" of Teflon® (TFE and FEP) to wires of any composition in AWG. Gauges: 14 to 60.

- **Teflon® Insulated Magnet Wire. Gauges: 14 to 60**
- **Teflon® Tubing & Lead Wire**
- **Wire Harness & Electronic Assembly Capability**
- **Microminiature and Subminiature Flat Cables. Gauges: 24 to 44**

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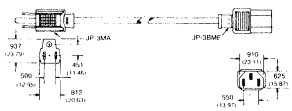
Power Dynamics now offers a line of internationally approved Cord Sets, consistent with our line of IEC Connectors. Selection of the proper Cord Set allows your international customer the convenience of a finished product ready for use immediately upon unpacking. The proper selection of a Cord Set also makes the product easier to use by overseas customers and enhances its overseas marketing value.

Power Dynamics offers seven basic Cord Sets to meet most international requirements. Each Cord Set is molded to indicate the appropriate National Safety Agency approvals as follows:

UNITED STATES	UL	BELGIUM	CEBEC	NETHERLANDS	KEMA		
CANADA	CSA	FINLAND	FEI	NORWAY	NEMKO		
ENGLAND	BSI	FRANCE	UTE	SWEDEN	SEMKO		
AUSTRALIA	SECV	GERMANY	VDE	SWITZERLAND	SEV		
AUSTRIA	OVE	ITALY	MQ				

AMERICAN CORD SET

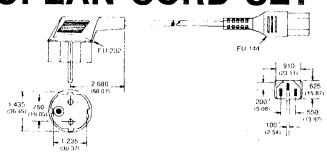
10088



Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
10088	7′6″ (2.3M)	18/3 SVT 41/34 B.C.	.255 (6.5)	10A 125V	Black	UL CSA

EUROPEAN CORD SET

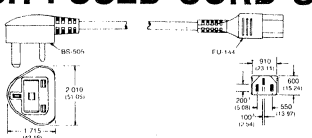
12013



Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
12013	8′2″ (2.5M)	3 x 0.75mm² H05VV-F	.255 (6.5)	6A 250V	Black	

ENGLISH FUSED CORD SET

14012



Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
14012	8′2″ (2.5M)	3 x 0.75mm² H05VV-F	.255 (6.5)	6A 250V	Black	

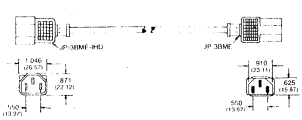
AUSTRALIAN/NEW ZEALAND CORD SET

15012

Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
15012	8′2″ (2.5M)	3 x 0.75mm² H05VV-F	.255 (6.5)	6A 250V	Black	

AMERICAN ELECTRONIC JUMPER CORD SET

10095
10096



Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
10095	3′3″ (1.0M)	18/3 SVT 41/34 B.C.	.255 (6.5)	10A 250V	Black	UL CSA
10096	7′6″ (2.3M)	18/3 SVT 41/34 B.C.	.255 (6.5)	10A 250V	Black	

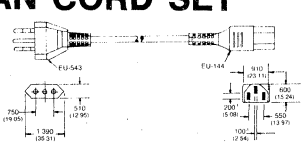
SWISS CORD SET

13012

Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
13012	8′2″ (2.5M)	3 x 0.75mm² H05VV-F	.255 (6.5)	6A 250V	Black	

ITALIAN CORD SET

14512



Part Number	Cord Length	Description	Nominal O.D.	Rating	Color	Approvals
14512	8′2″ (2.5M)	3 x 0.75mm² H05VV-F	.255 (6.5)	6A 250V	Black	

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Precision Interconnect meets specific packaging needs involving high density, high performance and reliability by designing and manufacturing connectors and cables, then terminating them into assemblies for specific applications. What results are some of the smallest, most reliable, most cost effective, complete interconnect systems in the world.

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- 10 to 67 contact positions
- 3 shell sizes, including 19 position "A"
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- Keyway polarization

Microminiature Strips
- Positions to 120
- Guide pins and polarizing available
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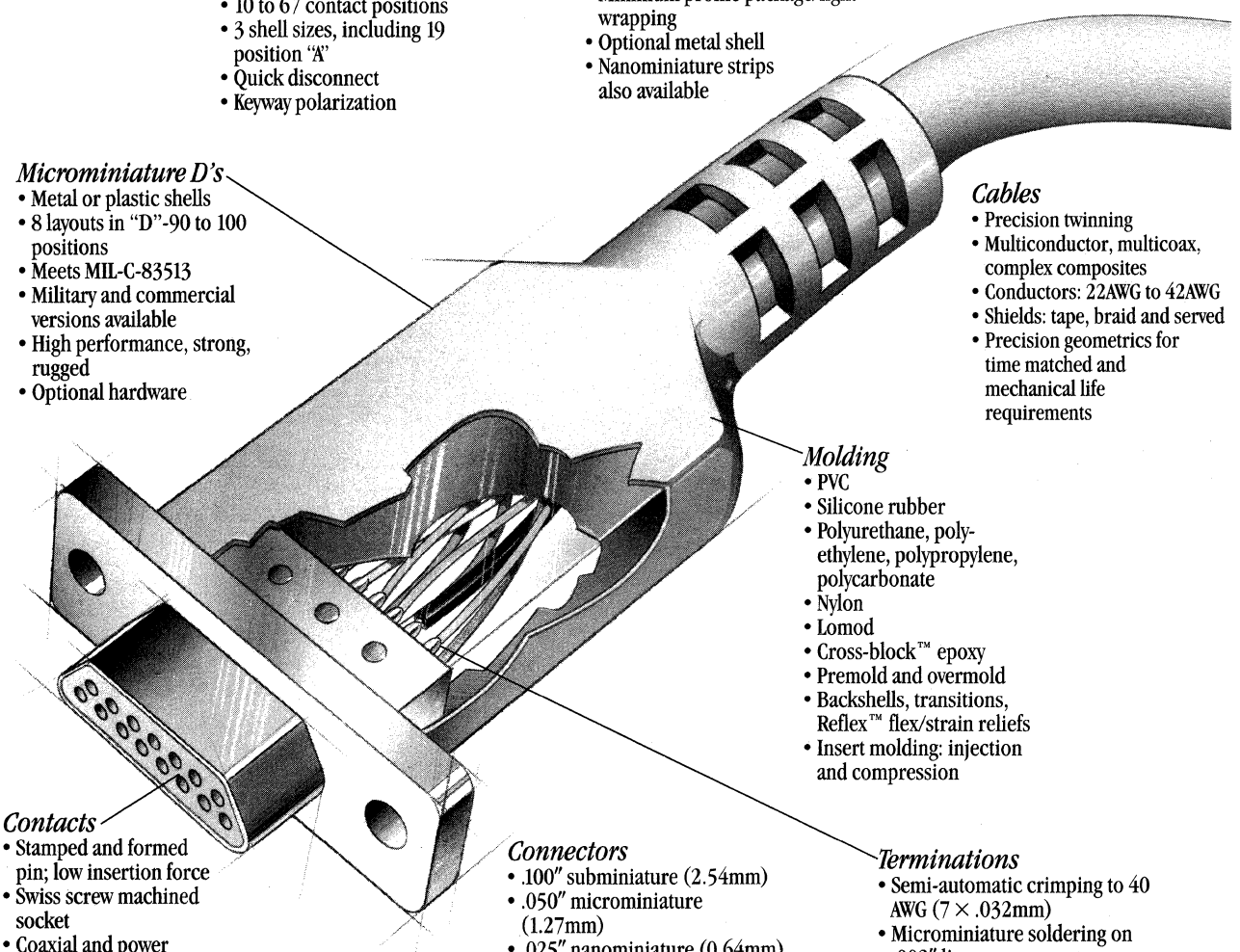
- Optional metal shell
- Nanominiature strips also available

Microminiature D's
- Metal or plastic shells
- 8 layouts in "D"-90 to 100 positions
- Meets MIL-C-83513
- Military and commercial versions available
- High performance, strong, rugged
- Optional hardware



Cables
- Precision twinning
- Multiconductor, multicoax, complex composites
- Conductors: 22AWG to 42AWG
- Shields: tape, braid and served
- Precision geometrics for time matched and mechanical life requirements

Molding
- PVC
- Silicone rubber
- Polyurethane, polyethylene, polypropylene, polycarbonate
- Nylon
- Lomod
- Cross-block™ epoxy
- Premold and overmold
- Backshells, transitions, Reflex™ flex/strain reliefs
- Insert molding: injection and compression

Contacts
- Stamped and formed pin; low insertion force
- Swiss screw machined socket
- Coaxial and power contacts available
- Cam-activated ZIF
- Custom contacts also available

Connectors
- .100″ subminiature (2.54mm)
- .050″ microminiature (1.27mm)
- .025″ nanominiature (0.64mm)
- .002″-0.10″ custom traces on substrates (0.05mm-0.25mm)
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- Custom designs

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- Semi-automatic crimping to 40 AWG (7 × .032mm)
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- Wire bonding

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WE UNDERSTAND MICRO

As electronic components and equipment get smaller, problems grow. By continually developing and testing new materials, configurations, manufacturing techniques, and termination processes, P.I. has been able to create smaller, more compact, lighter weight, highly reliable interconnect systems.

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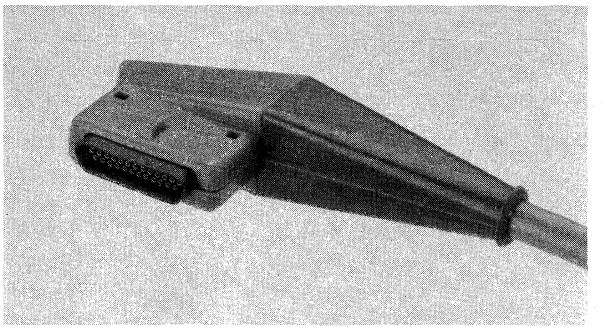
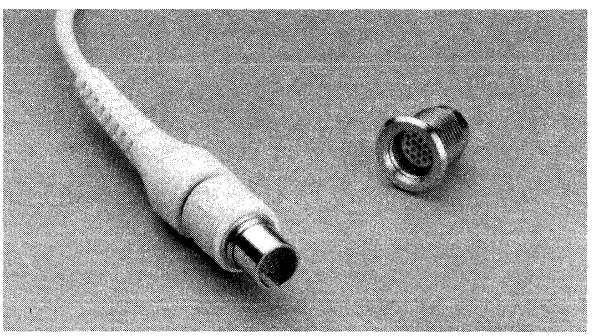
- Transmission line assemblies for high-speed electronic equipment
- Problem-solving, application-specific, cost-effective, completely tested interconnect systems.

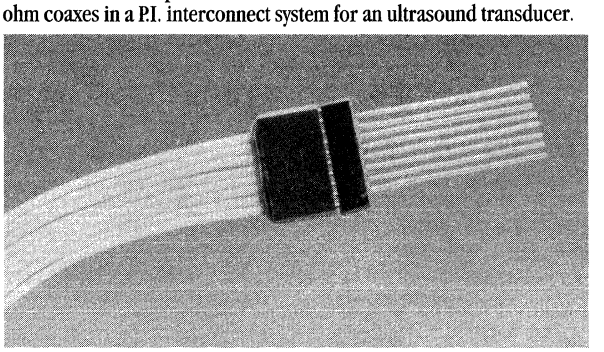


25 position Micro-D with crimped contacts for durability and cost savings incorporates injection molded backshell and strain relief on a multi conductor (32 AWG) twisted pair cable (time matched to 100 picoseconds) for a logic analyzer.



19 position, microminiature circular connector with a molded strain relief terminates a 16 conductor cable (8 twisted pair of 38 AWG) for a robotic interconnect system.

Microminiature strip connector terminates a cable of 66/38 AWG 50 ohm coaxes in a P.I. interconnect system for an ultrasound transducer.



Custom connectors in P.I. interconnect systems can be designed using nanominiature contacts (size 30) where greater weight and space savings are required in data processing, military and medical applications.

PRECISION INTERCONNECT

16640 S.W. 72nd
Portland, OR 97224

Phone (503) 620-9400
Telex 36-0963 NEC PTL
Facsimile (503) 620-7131

Offices in San Francisco, Boston, Wilmington, Costa Mesa and Düsseldorf.

The Advantages of Complete Microminiature Interconnect Systems.

THE SYSTEM

At Precision Interconnect, we not only design and manufacture application-specific microminiature cables and connectors, we terminate wires to connectors and add important components such as flex/strain reliefs when necessary. This way, by considering the interrelationship of all the critical components involved, our customers get a better designed and more reliable interconnect system.

MICRO CONNECTORS

Precision Interconnect's P.I. Micro Group designs interconnect systems using both existing microminiature and nanominiature connectors and custom designed, state-of-the-art connectors for specific applications. We specialize in connectors involving high contact density (as many as 1,600 contacts per square inch) with no degradation in reliability. The connectors we design and manufacture are critical components on interconnect systems for leading edge electronic companies around the world.

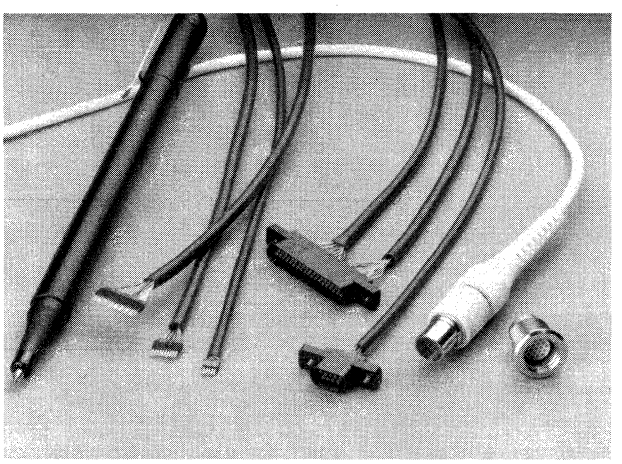
MICRO CABLES

Precision Interconnect pioneered the technology to produce microminiature, densely packed cables that can withstand the stresses of flexing, routing and torquing while maintaining precise electrical characteristics with extremely tight tolerances. We regularly manufacture cables with conductors as small as 42 AWG, and extrude insulations as thin as .002", making the smallest precision coaxes available.

MICRO TERMINATIONS

Precision Interconnect creates interconnect systems by terminating conductors to selected connectors and packaging them into cable assemblies. Our semi-automatic crimping machines produce reliable, cost-effective terminations. For special applications requiring the ultimate in miniaturization, wires can be soldered or bonded to substrates with .002" traces, .004" centers.

P.I.'s interconnect systems can consist of multiconductor round or flat cables, insulated wire harnesses, flex circuitry, substrates or custom chassis.



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Facsimile (503) 620-7131

Offices in San Francisco, Boston, Wilmington, Costa Mesa and Düsseldorf.

SHOGYO CONNECTORS, JACKS & PLUGS

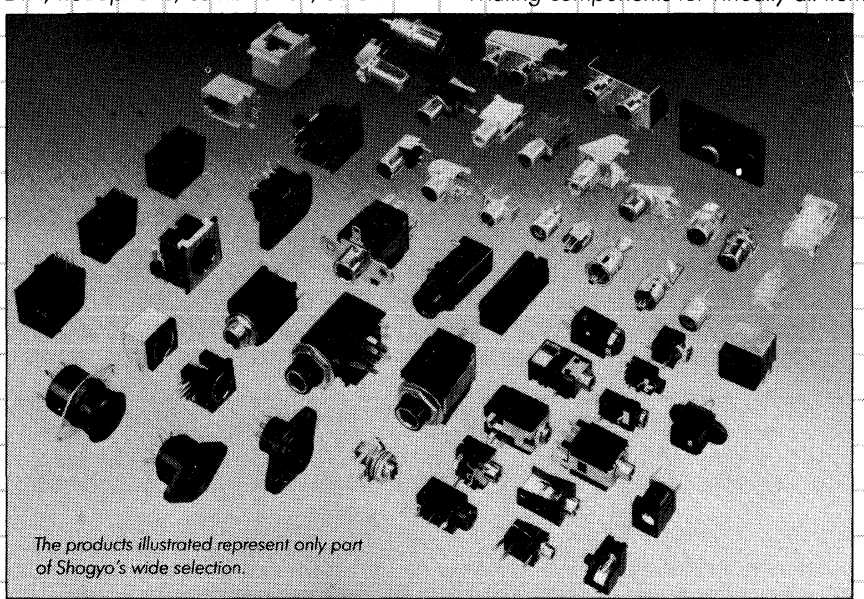
Your design deserves Shogyo quality and reliability.
You deserve...
Shogyo Service... comprehensive, responsive and fast
Shogyo Professionalism... the helpful experience you need
Shogyo Prices... always competitive, usually better
and...
Shogyo Selection... with complete custom design capabilities

Including a diverse offering of miniature and microminiature:

- *Connectors:*
  modular, panel mount, chassis mount, pin printed circuit mount, DIN, coaxial cable, cable, miniature consent, feeder consent, tube socket, BNC, UHF, and MIC
- *Jacks:*
  RCA phono and chassis mount, communications, phone, multi-conductor, closed and open circuit, stereo, in-line, barrel, sub miniature enclosed phone, PC mount, panel mount, DC, open frame, DC power, earphone, DIN, headphone, combination, auto antenna, pin polarized, and banana
- *Plugs:*
  phone, communication, barrel, microphone, DC, automobile, automobile antenna, DIN, RCA phono, pin, coaxial, banana, solderless, pin tip, and polarizing
- *Modular telephone apparatus:*
  a full line of jacks, connectors, handset and line cords
- *Terminal boards, binding posts, barrier strips, clips, and fuse holders*

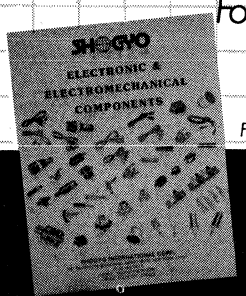
And featuring:

- *Shielding*
- *A wide variety of angles, mountings, sizes and shapes*
- *Mating components for virtually all items*



The products illustrated represent only part of Shogyo's wide selection.

For immediate assistance and specific information on the product(s) you require:
Dial 516-466-0911 or FAX 516-466-0922



For complete product listings and specifications, request our free catalog.

SPECIFY SHOGYO. ELECTRONIC COMPONENTS AS GOOD AS YOUR DESIGN.
Shogyo International Corporation
Dept. EM, 287 Northern Boulevard,
Great Neck, New York 11021-4799
(516) 466-0911. Cable: SHOGYONEWYORK.
Telex: 12218 & 4758024. FAX: (516) 466-0922.

SHOGYO

SHOGYO CORD SETS AND CABLE ASSEMBLIES

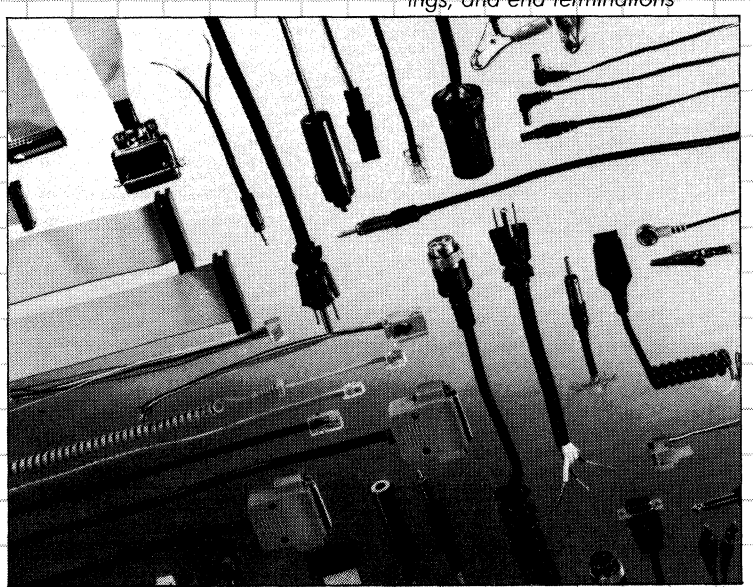
Your design deserves Shogyo quality and reliability.
You deserve...
Shogyo Service... comprehensive, responsive and fast
Shogyo Professionalism... the helpful experience you need
Shogyo Prices... always competitive, usually better
and...
Shogyo Selection... with complete custom design capabilities

Including a diverse offering of:

- *Telecommunication:*
  coiled, straight, round, flat, or oval; copper, stranded or tinsel; with 4, 6 or 8-position modular plugs or spade lugs; and keyed or un-keyed for mating with connectors
- *Audio:*
  shielded, unshielded, single or multi-conductor, with molded plugs and in-line jacks
- *Zip:*
  standard or custom lengths, gauges, insulation thicknesses and jacket colors, with DC or phone plugs in a variety of sizes
- *Computer/Video:*
  (from 9–50 pins, male or female, plastic or metal, low-profile, edgewise or multi-polar), DIN cables produced to spec (available with shielding), and RCA phono
- *Power:*
  European or American, single or multi-conductor, custom made to specified current and temperature ratings, standard SPT-1 & 2, ST, SVT, SJT, XT or PXT, UL/CSA approved

And featuring:

- *A comprehensive selection of lengths, thicknesses, coilings, and end terminations*



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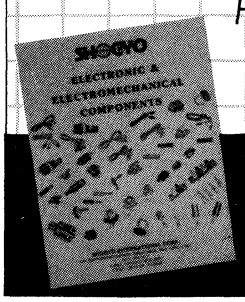

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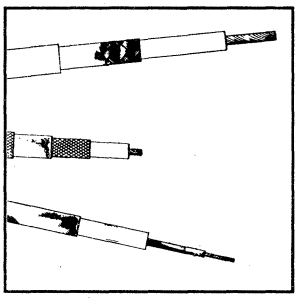
SHOGYO

Rowe High Temperature, High Voltage, Cable and Wire

High Voltage Cable



Rowe Industries has provided industry and the military with high reliability, corona-free, high voltage cable designed for use in varied and exacting applications such as accelerators, radar, X-ray, and ECM equipment.

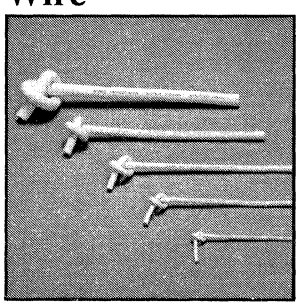
The semi-conducting corona-suppressing layers with thermosetting materials provide noise free, corona-free cable and wire. Various high pulse coax and triax types are listed in the chart.

Primary insulation is extruded silicone and outer jacket is silicone, neoprene or PVC. Consult factory for exact cable construction.

Cable jacket color is black. Additional colors are available for some cables. Consult factory.

Rowe Cable No.	Center Conductor AWG Size & Plating	Final O.D. (Inches)	Capitance Rating PF/FT	Voltage Rating KVDC
Coax				
R5234-1	#20 (14/32) TPC	.215	43	30
R5743-1	#20 (19/32) SPC	.260	30	15
R1020-2	#20 (19/33) TPC	.280	36	15
2R1032-4	#16 (19/29) SPC	.340	48	30
R3146-2	#22 (19/34) SPC	.285	50	25
2R1020-3	#20 (7/26) SPC	.375	46	30
R1037-1	#16 (19/29) TPC	.495	50MMF/FT	25
R1035-1	#16 (19/29) TPC	.565	50	25
R7000-1	#16 (19/29) TPC	.615	56	40
R1006-1	#12 (19/25) TPC	.625	50	50
R1081-2	#12 (19/25) SPC	.670	55	56
2R1080-1	#10 (37/26) TPC or SPC	1.100	55	90
R1046-1	#10 (19/23) TPC	.830	49	75
Triax				
R1296-1	#12 (19/25) TPC	.540	66	30
R7010-1	#6 (133/27) TPC	.825	100	40
R7020-1	#12 (19/25) TPC	.880	56	55
2R1068-1	#8 (133/29) SPC	1.200	51	80
R1068-1	#10 (19/23) TPC or SPC	1.000	40	100

"Super Tough" High Voltage Silicone Lead Wire



"Super Tough" High Voltage Silicone Lead Wire was developed for high abrasion resistance requirements and exhibits excellent dielectric capability in extreme environments. Used for military, space, medical and industrial applications.

Specifications*
Conductor—Silver or tin plated copper stranding**
Temperature Rating—SPC -65° to +200° C (250° C Intermittent)—TPC -40° C to +150° C

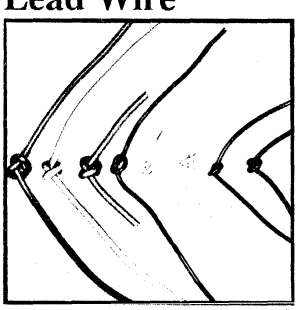
Voltage Ratings—Maximun DC voltage rating in air

*Consult factory for variation available for conductor stranding, plating, AWG, size & voltage rating. Standard insulation is white. Other colors and special configurations available.

**When ordering tin plated stranding, add "/TPC" to P/N (i.e. R790-2022/TPC)

Rowe Catalog No.	AWG Size	Strand	O.D. Nom.	Maximum Operating Volt. Rating DC
R790-0522	22	7/30	.070	5KV
R790-1522	22	19/34	.110	15KV
R790-2022	22	7/30	.130	20KV
R790-2522	22	19/34	.160	25KV
R790-1520	20	19/32	.120	15KV
R790-2020	20	19/32	.150	20KV
R790-2520	20	19/32	.166	25KV
R790-3020	20	19/32	.190	30KV
R790-2518	18	19/30	.160	25KV
R790-4518	18	19/30	.295	45KV
R790-2016	16	41/32	.161	20KV
R790-3516	16	41/32	.265	35KV
R790-4516	16	19/29	.300	45KV
R790-6016	16	26/30	.380	60KV
R790-3014	14	19/27	.256	30KV
R790-6014	14	19/27	.385	60KV
R790-2012	12	19/25	.205	20KV
R790-3012	12	19/25	.275	30KV
R790-4012	12	19/25	.335	40KV
R790-5012	12	19/25	.414	50KV

"UL 3239" High Voltage Silicone Lead Wire



"UL 3239" High Voltage Silicone Lead Wire exhibits excellent dielectric capability in extreme environment areas where high abrasion resistance, high voltage, flame resistance, and flexibility are major requirements. Used for military, space and industrial applications.

Specifications:*
Conductor—Tin-plated copper stranding (/SPC indicates silver plating)
Temperature Rating—150° C (250° C Intermittent)
Voltage Ratings—Maximum DC voltage rating in air
Wire Marking—Per UL 3239 requirements

*Consult factory for variation available for conductor stranding, plating, AWG, size & voltage rating. Standard insulation is white. Other colors and special configurations available.

Rowe Catalog No.	AWG Size	Strand	Nom. Wall Thickness (Inches)	Nom. O.D.	Voltage Rating
R800-2022	22	7/30	.050	.130	20KV
R800-2522	22	7/30	.065	.160	25KV
R800-3022	22	7/30	.090	.210	30KV
R800-2020	20	10/30	.050	.135	20KV
R800-2520	20	10/30	.065	.165	25KV
R800-3020	20	10/30	.090	.215	30KV
R800-2018	18	16/30	.050	.150	20KV
R800-2518	18	16/30	.065	.180	25KV
R800-3018	18	16/30	.090	.230	30KV
R800-2016	16	26/30	.050	.160	20KV
R800-3016	16	26/30	.090	.240	30KV
R800-4016	16	26/30	.120	.300	40KV
R800-3014	14	41/30	.090	.255	30KV
R800-4014	14	41/30	.120	.315	40KV
R800-4012	12	65/30	.120	.335	40KV
R800-5012	12	65/30	.160	.415	50KV
R800-4010	10	105/30	.120	.360	40KV
R800-5010	10	105/30	.160	.440	50KV

Connectors • Cable Assemblies • Electronic Products • Specialists in Corona-Free High Voltage Interconnections

6225 Benore Road
P.O. Box 6877
Toledo, OH 43612-0877
Toledo: (419) 729-9761

FAX: (419) 729-1794
TWX: (810) 442-1734
East Coast Office: (617) 273-3888
East Coast FAX: (617) 272-6724

West Coast Offices:
(408) 778-6210
(213) 235-2070
West Coast FAX: (408) 779-0917

ROWE INDUSTRIES, INC.
Talley Industries

For information on Rowe connections and cable assemblies see the Connectors, Terminals & Sockets Section.

VIRGINIA PLASTICS
1701 MIDLAND ROAD/SALEM, VA 24153
P.O. BOX 4577/ROANOKE, VA 24015-0577
703-375-0100
FAX 703-375-0135

FLAT/OVAL MULTI-CONDUCTOR

- ☐ UNIFORM CAPACITANCE THROUGHOUT THE CABLE OR ANY CABLE SECTION
- ☐ provides consistent electrical transmission properties between multiple lots of cable
- ☐ DESIGNED FOR CONNECTORIZING WITH DATA MODULAR MALE PLUGS
- ☐ GOOD FIELD RELIABILITY
- ☐ IMPROVED FLEXIBILITY FOR EASIER INSTALLATION AND ENHANCED APPEARANCE
- ☐ LOW HEIGHT OF CABLE COMPARED TO STANDARD I/O CABLES
- ☐ reduces bulkiness of an installation
- ☐ allows higher density of multiple cables
- ☐ FLAT/OVAL CABLE CONSTRUCTIONS ARE CONFIGURABLE IN ONE OF TWO WAYS FOR CONNECTING THE CABLE:
- ☐ simulated pairs—balanced line configuration
- ☐ parallel—non-balanced or single line configuration
- ☐ NEC® Power-Limited Circuit Cable Article 725 Class 2 & 3 Circuits (CL2).

2 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Parallel Termination
Pair #1 Red/Green	#1 Red #2 Green

(this cable is identical for either configuration)

4 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Parallel Termination
Pair #1 Black/Red #2 Green/Yellow	#1 Black #2 Red #3 Green #4 Yellow

6 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Parallel Termination
Pair #1 White/Black #2 Red/Green #3 Yellow/Blue	#1 White #2 Black #3 Red #4 Green #5 Yellow #6 Blue

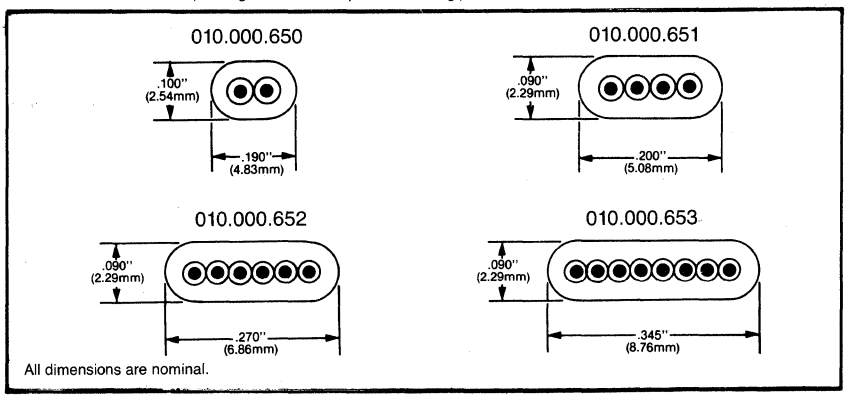
8 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Parallel Termination
Pair #1 Blue/Orange #2 Black/Red #3 Green/Yellow #4 Brown/Grey	#1 Blue #2 Orange #3 Black #4 Red #5 Green #6 Yellow #7 Brown #8 Grey

SEVERE DUTY FLAT/OVAL MULTI-CONDUCTOR PHYSICAL ENGINEERING DATA

Property	Cable Part Number			
	010.000.650	010.000.651	010.000.652	010.000.653
Conductor Type	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy
Conductor Stranding (AWG)	7x34 (26)	7x34 (26)	7x34 (26)	7x34 (26)
Number of conductors (excluding drain wire)	2	4	6	8
Insulation Material	MYLAR® or C21	MYLAR® or C21	MYLAR® or C21	MYLAR® or C21
Shielded Cable: Y/N	N	N	N	N
Drain Wire Material Type	—	—	—	—
Drain Wire AWG Nominal	—	—	—	—
Shield Type	—	—	—	—
Shield coverage	—	—	—	—
Shield configuration	—	—	—	—
Jacket Material	C75	C75	C75	C75
Jacket Flammability Rating	UL 94VO @ .025" (.64mm) Thickness	UL 94VO @ .025" (.64mm) Thickness	UL 94VO @ .025" (.64mm) Thickness	UL 94VO @ .025" (.64mm) Thickness
Jacket Color	Black	Black	Black	Black
Jacket Finish	Matte	Matte	Matte	Matte
Nominal Cable O.D. inches (mm)	.100x.190 (2.54x4.83)	.090x.200 (2.29x5.08)	.090x.270 (2.29x6.86)	.090x.345 (2.29x8.76)
Cable Configuration	Configurable as Simulated Pair or Parallel			
Can be coiled: Y/N	Y	Y	Y	Y
Outdoor use: Y/N	Y	Y	Y	Y
Cable durability category	Excellent	Excellent	Excellent	Excellent
Flex life	Good-Very Good	Good-Very Good	Good-Very Good	Good-Very Good
UL Temperature Rating	80°C	80°C	80°C	80°C
UL Style(s)	20187	20187	20187	20187
[1]Nominal Impedance @ 4 MHz (as Simulated pair)	100Ω	95Ω	95Ω	95Ω

Other conductor sizes and cable constructions are available upon request.
Color-matched outer jackets to customer specifications are available.
MYLAR® is a registered trademark of E.I. Du Pont de Nemours & Co., Inc.
[1]Test results were obtained per Virginia Plastics impedance testing procedures.



All dimensions are nominal.

VIRGINIA PLASTICS
1701 MIDLAND ROAD/SALEM, VA 24153
P.O. BOX 4577/ROANOKE, VA 24015-0577
703-375-0100
FAX 703-375-0135

MULTI-PURPOSE DATA CABLES/UNSHIELDED

- ☐ UNIFORM CAPACITANCE THROUGHOUT THE CABLE OR ANY CABLE SECTION
- ☐ reduces capacitance imbalances between sections taken from a single length of cable
- ☐ eliminate impedance mismatches that are typically found throughout a single length of cable
- ☐ provides consistent electrical transmission properties between multiple lots of cable
- ☐ DESIGNED FOR CONNECTORIZING WITH DATA MODULAR MALE PLUGS
- ☐ HIGHER FIELD RELIABILITY THAN STANDARD I/O CABLES
- ☐ IMPROVED FLEXIBILITY FOR EASIER INSTALLATION AND ENHANCED APPEARANCE
- ☐ ALL MULTI-PURPOSE DATA CABLE CONSTRUCTIONS ARE CONFIGURABLE IN ONE OF TWO WAYS FOR CONNECTING THE CABLE:
- ☐ simulated pairs—balanced line configuration
- ☐ lower capacitance isolated conductors*—non-balanced or single line configuration

4 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Lower Capacitance Termination
Pair	Isolated
#1 Black/White	#1 Black/Red
#2 Red/Green	#2 White/Green

6 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Lower Capacitance Termination
Pair	Isolated
#1 Black/White	#1 Black/Red
#2 Red/Green	#2 White/Green
#3 Brown/Blue	#3 Brown/Blue

8 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Lower Capacitance Termination
Pair	Isolated
#1 Black/White	#1 Black/Red
#2 Red/Green	#2 White/Green
#3 Brown/Blue	#3 Brown/Orange
#4 Orange/Yellow	#4 Blue/Yellow

10 CONDUCTOR
CONFIGURED TO BE A

Simulated Pair Termination	Lower Capacitance Termination
Pair	Isolated
#1 Black/White	#1 Black/Red
#2 Red/Green	#2 White/Green
#3 Brown/Blue	#3 Brown/Orange
#4 Orange/Yellow	#4 Blue/Yellow
#5 Purple/Grey	#5 Purple/Grey

*measured between two single conductors

ALSO AVAILABLE IN SHIELDED VERSIONS
CONTACT FACTORY FOR DISTRIBUTORS

SEVERE DUTY/EXTENDED LIFE UNSHIELDED MULTI-PURPOSE DATA CABLE PHYSICAL ENGINEERING DATA

Property	Cable Part Number			
	010.000.672	010.000.673	010.000.674	010.000.675
Conductor Type	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy
Conductor Stranding (AWG)	7x34 (26)	7x34 (26)	7x34 (26)	7x34 (26)
Number of conductors (excluding drain wire)	4	6	8	10
Insulation Material	MYLAR® or C21	MYLAR® or C21	MYLAR® or C21	MYLAR® or C21
Shielded Cable: Y/N	N	N	N	N
Drain Wire Material Type	—	—	—	—
Drain Wire AWG Nominal	—	—	—	—
Shield Type	—	—	—	—
Shield coverage	—	—	—	—
Shield configuration	—	—	—	—
Jacket Material	C75	C75	C75	C75
Jacket Flammability Rating	UL 94VO @ .025" (.64mm) Thickness	UL 94VO @ .025" (.64mm) Thickness	UL 94VO @ .025" (.64mm) Thickness	UL 94VO @ .025" (.64mm) Thickness
Jacket Color	Black	Black	Black	Black
Jacket Finish	Matte	Matte	Matte	Matte
Nominal Cable O.D. inches (mm)	.145 (3.68)	.165 (4.19)	.185 (4.70)	.200 (5.08)
Cable Configuration	Configurable as Simulated Pair or Low Capacitance			
Can be coiled: Y/N	Y	Y	Y	Y
Outdoor use: Y/N	Y	Y	Y	Y
Cable durability category	Excellent	Excellent	Excellent	Excellent
Flex life	Excellent	Excellent	Excellent	Excellent
UL Temperature Rating	80°C	80°C	80°C	80°C
UL Style(s)	20187	20187	20187	20187
[1]Nominal Impedance @ 4 MHz (as Simulated pair)	90Ω	90Ω	90Ω	90Ω

Other conductor sizes and cable constructions are available upon request.
Color matched outer jackets to customer specifications are available.
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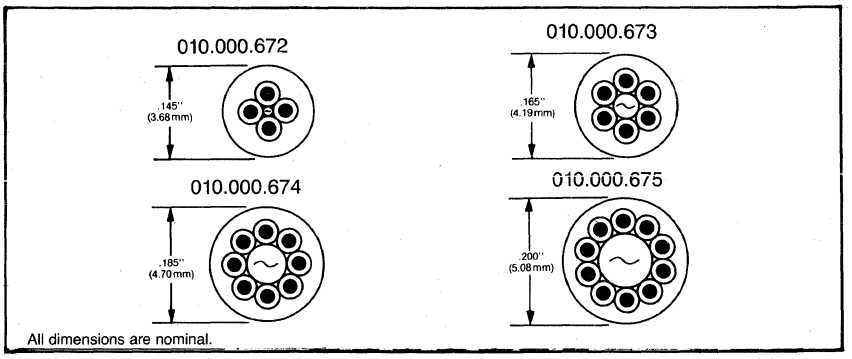
[1]Test results were obtained per Virginia Plastics impedance testing procedures.



All dimensions are nominal.

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1701 MIDLAND ROAD/SALEM, VA 24153
P.O. BOX 4577/ROANOKE, VA 24015-0577
703-375-0100
FAX 703-375-0135

TWISTED PAIR DATA CABLE

- ☐ UNIFORM CAPACITANCE THROUGHOUT THE CABLE OR ANY CABLE SECTION
- ☐ minimizes capacitance imbalances between sections of cable typically found in datacommunications cable
- ☐ provides matched impedance throughout the cable
- ☐ provides consistent electrical cable properties between multiple lots of cable
- ☐ SPECIAL CABLING PROCESS PRODUCES A UNIFORM TWIST OF THE PAIRED CONDUCTORS
- ☐ DESIGNED FOR CONNECTORIZING WITH DATA MODULAR MALE PLUGS
- ☐ GOOD FIELD RELIABILITY AND EXTENDED LIFE
- ☐ PAIRED CONDUCTORS MAINTAIN THEIR TWIST ARRANGEMENT REGARDLESS OF CABLE ROUTINGS USED FOR INSTALLING OFFICE LAYOUTS OR LAYOUT CHANGES
- ☐ IMPROVED FLEXIBILITY FOR EASIER INSTALLATION AND ENHANCED APPEARANCE

UNSHIELDED

Two unshielded twisted pair
Standard Conductor Colors

Black/Yellow
Red/Green

Three unshielded twisted pair
Standard Conductor Colors

Black/Yellow
Red/Green
Blue/White

Four unshielded twisted pair
Standard Conductor Colors

Black/Yellow
Red/Green
Blue/White
Orange/Brown

Contact Virginia Plastics for special color code requirements

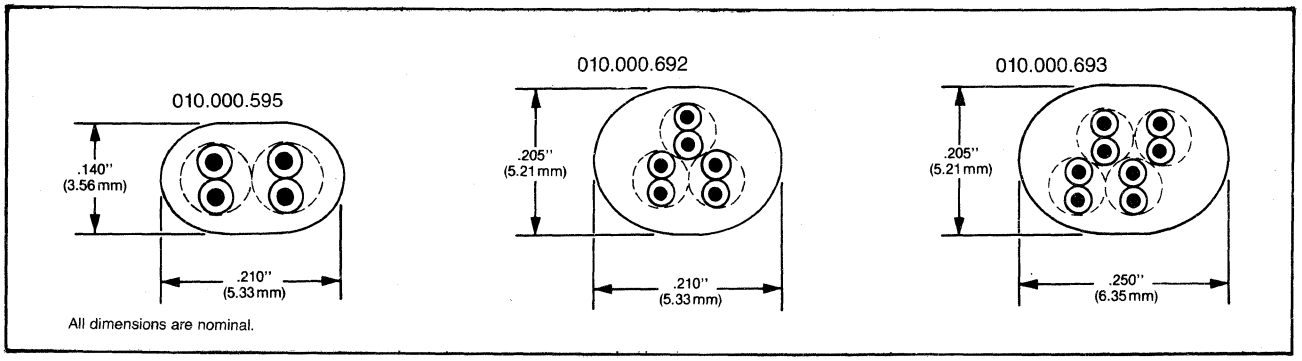
ALSO AVAILABLE IN SHIELDED VERSIONS

CONTACT FACTORY FOR DISTRIBUTORS

IMPEDANCE CONTROLLED UNSHIELDED TWISTED PAIR DATA CABLE PHYSICAL ENGINEERING DATA

Property	Cable Part Number		
	010.000.595	**010.000.692**	**010.000.693**
Conductor Type	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy	Tin-Plated Copper/Alloy
Conductor Stranding (AWG)	7x34 (26)	7x34 (26)	7x34 (26)
Number of conductors (excluding drain wire)	4	6	8
Insulation Material	MYLAR® or C21	MYLAR® or C21	MYLAR® or C21
Shielded Cable: Y/N	N	N	N
Drain Wire Material Type	—	—	—
Drain Wire AWG Nominal	—	—	—
Shield Type	—	—	—
Shield coverage	—	—	—
Shield configuration	—	—	—
Jacket Material	Phenyl PVC	Phenyl PVC	Phenyl PVC
Jacket Flammability Rating	UL 94VO @ .030" (.76mm) Thickness	UL 94VO @ .030" (.76mm) Thickness	UL 94VO @ .030" (.76mm) Thickness
Jacket Color	Black	Black	Black
Jacket Finish	Semi-Gloss	Semi-Gloss	Semi-Gloss
Nominal inches Cable O.D. (mm)	.140x.210 (3.56x5.33)	.205x.210 (5.21x5.33)	.205x.250 (5.21x6.35)
Cable Configuration	Two Unshielded Twisted Pair	Three Unshielded Twisted Pair	Four Unshielded Twisted Pair
Can be coiled: Y/N	Y	Y	Y
Outdoor use: Y/N	N	N	N
Cable durability category	Very Good	Very Good	Very Good
Flex life	Very Good	Very Good	Very Good
UL Temperature Rating	60°C-80°C	60°C-80°C	60°C-80°C
UL Style(s)	2626	2626	2626
[1]Nominal Impedance @ 4 MHz (as twisted pair)	100Ω	100Ω	100Ω

Other conductor sizes and cable constructions are available upon request.
Color matched outer jackets to customer specifications are available.
MYLAR® is a registered trademark of E.I. Du Pont de Nemours & Co., Inc.
[1]Test results were obtained per Virginia Plastics impedance testing procedures.



All dimensions are nominal.

WEICO HOOK-UP WIRE PVC INSULATED

MIL-W-16878 TYPE B - 600V

(PASSES UL VW-1 FLAME TEST)

DESCRIPTION:
Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation

CHARACTERISTICS:
- Temperature Rating: —55°C to +105°C
- Voltage Rating: 600 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
1130	M16878/1BBB-X	30	7/38	.010	.032
1128	M16878/1BCB-X	28	7/36	.010	.034
1126	M16878/1BDB-X	26	7/34	.010	.038
1126/19	M16878/1BDE-X	26	19/38	.010	.038
1124	M16878/1BEB-X	24	7/32	.010	.043
1124/19	M16878/1BEE-X	24	19/36	.010	.043
1122	M16878/1BFB-X	22	7/30	.010	.050
1122/19	M16878/1BFE-X	22	19/34	.010	.050
1120	M16878/1BGB-X	20	7/28	.010	.058
1120/19	M16878/1BGE-X	20	19/32	.010	.058
1118	M16878/1BHB-X	18	7/26	.010	.068
1118/19	M16878/1BHE-X	18	19/30	.010	.068
1116/19	M16878/1BJE-X	16	19/29	.010	.077
1114/19	M16878/1BKE-X	14	19/27	.010	.091

MIL-W-16878 TYPE C - 1000V

(PASSES UL VW-1 FLAME TEST)

DESCRIPTION:
Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation.

CHARACTERISTICS:
- Temperature Rating: —55°C to +105°C
- Voltage Rating: 1000 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
1224	M16878/2BEB-X	24	7/32	.016	.058
1222	M16878/2BFB-X	22	7/30	.016	.064
1220	M16878/2BGB-X	20	7/28	.016	.072
1218	M16878/2BHB-X	18	7/26	.016	.082
1216/19	M16878/2BJE-X	16	19/29	.016	.091
1214/19	M16878/2BKE-X	14	19/27	.016	.105
1212/19	M16878/2BLE-X	12	19/25	.016	.124

MIL-W-16878 TYPE D - 3000V

(PASSES UL VW-1 FLAME TEST)

DESCRIPTION:
Stranded, Tinned Copper, Color Coded Polyvinylchloride Insulation

CHARACTERISTICS:
- Temperature Rating: —55°C to +105°C
- Voltage Rating: 3000 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
1324	M16878/3BEB-X	24	7/32	.029	.082
1322	M16878/3BFB-X	22	7/30	.029	.088
1320	M16878/3BGB-X	20	7/28	.029	.096
1318	M16878/3BHB-X	18	7/26	.029	.106
1316/19	M16878/3BJE-X	16	19/29	.029	.115
1314/19	M16878/3BKE-X	14	19/27	.029	.129
1312/19	M16878/3BLE-X	12	19/25	.034	.158
1310	M16878/2BMG-X	10	37/26	.037	.185
1308	M16878/3BNL-X	8	133/29	.040	.247
1306	M16878/3BPL-X	6	133/27	.040	.290
1304	M16878/3BRL-X	4	133/25	.046	.358
1302	M16878/3BSP-X	2	665/30	.046	.432

COLORS: 0 = Black 2 = Red 4 = Yellow 6 = Blue 8 = Gray
1 = Brown 3 = Orange 5 = Green 7 = Violet 9 = White

X Denotes 0-9 color coding Standard Put-Ups: 100 ft., 1000 ft.

***STRIPES: Any of the above colors are available in any combination of stripes up to a maximum of three stripes.*

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WEICO HOOK-UP WIRE PVC INSULATED

MIL-W-16878 PREBONDED TYPE B-600V

(PASSES UL VW-1 FLAME TEST)

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
1526	26	7/34	.039
1524	24	7/32	.044
1522	22	7/30	.051
1520	20	7/28	.059
1518	18	7/26	.070

DESCRIPTION:
Stranded Double Tinned, Pre-Bonded Copper Conductor, Color Coded PVC Insulated

CHARACTERISTICS:
- Temperature Rating:—55°C to +105°C
- Voltage Rating: 600 Volts

APPLICATION:
The pre-bond conductor maintains much of the flexibility of an ordinary stranded wire but reduces processing and handling costs on soldering, retwisting of strands after stripping, and hand tinning operations.

MIL-W-16878/17 NYLON JACKET TYPE BN-600V

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	INSULATION THICKNESS	NYLON JACKET THICKNESS	NOM. O.D. (INCHES)
1926/19	M16878/17BDE-X	26	19/38	.010	.003	.044
1926	M16878/17BDB-X	26	7/34	.010	.003	.044
1924/19	M16878/17BEE-X	24	19/36	.010	.003	.049
1924	M16878/17BEB-X	24	7/32	.010	.003	.049
1922/19	M16878/17BFE-X	22	19/34	.010	.003	.056
1922	M16878/17BFB-X	22	7/30	.010	.003	.056
1920/19	M16878/17BGE-X	20	19/32	.010	.003	.064
1918/19	M16878/17BHE-X	18	19/30	.010	.003	.074
1916/19	M16878/17BJE-X	16	19/29	.010	.003	.083
1914/19	M16878/17BKE-X	14	19/27	.010	.004	.099

DESCRIPTION:
Conductor, Stranded Tinned Copper. Insulation, Color Coded PVC. Jacket, Clear Nylon.

CHARACTERISTICS:
- Temperature Rating:—55°C +115°C
- Voltage Rating: 600 Volts

MIL-W-76B TYPE MW-1000V

(PASSES UL VW-1 FLAME TEST)

WEICO NO.	TYPE DESIGNATION	CONDUCTOR SIZE	CONDUCTOR STRAND	INSULATION THICKNESS	NOM. O.D. (INCHES)
1624	MW-C24(7)U	24	7/32	0.016	0.059
1622	MW-C22(7)U	22	7/30	0.016	0.064
1620	MW-C20(10)U	20	10/30	0.016	0.073
1618	MW-C18(16)U	18	16/30	0.016	0.084
1616	MW-C16(26)U	16	26/30	0.016	0.095
1614	MW-C14(41)U	14	41/30	0.016	0.110
1612	MW-C12(65)U	12	65/30	0.016	0.125

DESCRIPTION:
Conductor, Stranded Tinned Copper. Insulation, Color Coded PVC.

CHARACTERISTICS:
- Temperature Rating:—40°C to +80°C
- Voltage Rating: 1000 Volts

COLORS: 0 = Black 2 = Red 4 = Yellow 6 = Blue 8 = Gray Stripes**
1 = Brown 3 = Orange 5 = Green 7 = Violet 9 = White

X Denotes 0-9 color coding Standard Put-Ups: 100 ft., 1000 ft.

***STRIPES: Any of the above colors are available in any combination of stripes up to a maximum of three stripes.*

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HOOK-UP WIRE IRRADIATED PVC INSULATED THHN UNIVERSAL CIRCUIT WIRE

MIL-W-16878 TYPES B AND C IRRADIATED

1429 1430

DESCRIPTION:
Stranded Tinned Plated Copper, Irradiated PVC Insulated

CHARACTERISTICS:
- Temperature Rating:
  MIL-W-16878: —55° to +105°C
  UL 1429: +80°C
  UL 1430: +105°C
- Voltage Rating:
  MIL-W-16878
  Type B: 600 Volts
  Type C: 1000 Volts
  UL Style 1429: 150 Volts
  UL Style 1430: 300 Volts

COLORS:
0 = Black 2 = Red 4 = Yellow 6 = Blue 8 = Gray
1 = Brown 3 = Orange 5 = Green 7 = Violet 9 = White

STRIPES: Any of the above colors are available in any combination of stripes up to a maximum of three stripes.

TYPE B—UL STYLE 1429

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
1428	28	7/36	.010	.035
1426	26	7/34	.010	.038
1424	24	7/32	.010	.043
1424/19	24	19/36	.010	.043
1422	22	7/30	.010	.050
1422/19	22	19/34	.010	.050
1420	20	7/28	.010	.058
1420/19	20	19/32	.010	.058
1418	18	7/26	.010	.068
1418/19	18	19/30	.010	.068
1416/19	16	19/.0117	.010	.077
1414/19	14	19/27	.012	.095

TYPE C—UL STYLE 1430

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
1446	24	7/32	.016	.058
1446/19	24	19/36	.016	.058
1447	22	7/30	.016	.064
1447/19	22	19/34	.016	.064
1448	20	7/28	.016	.072
1448/19	20	19/32	.016	.072
1449	18	7/26	.016	.082
1449/19	18	19/30	.016	.082
1450	16	19/29	.016	.091
* 1451	14	19/27	.016	.105
* 1452	12	19/25	.016	.124

STANDARD PUT-UP: 100 ft., 1000 ft. **UL 3317*

THHN UNIVERSAL CIRCUIT WIRE 600V

DESCRIPTION:
Stranded or Solid Bare Copper, PVC Insulation and Clear Nylon Jacket Overall. Used for Building Wire Machine Tool Wire, Appliances, Lighting Ballasts and General Hook-up Wire.

CHARACTERISTICS:
- Temperature Rating: +105°C
- Voltage Rating: 600 Volts

COLORS:
0 = Black 2 = Red 4 = Yellow 6 = Blue
1 = Brown 3 = Orange 5 = Green 9 = White

WEICO NO.	COND. SIZE (AWG) & STRANDING	INSULATION THICKNESS	NOMINAL JACKET THICKNESS	NOM. O.D. (INCHES)
1431	#14 Solid	0.15	.004	.110
1432	#12 Solid	0.15	.004	.125
1433	#10 Solid	0.20	.004	.155
† 1434	#16 (19)	0.15	.004	.100
1435	#14 (19)	0.15	.004	.116
1436	#12 (19)	0.15	.004	.135
1437	#10 (19)	0.20	.004	.170
1438	#8 (19)	0.30	.005	.225
1439	#6 (19)	0.30	.005	.260
1440	#4 (19)	0.40	.006	.335
1441	#2 (19)	0.40	.006	.400
1442	#1 (37)	0.50	.007	.450
1443	#1/0 (37)	0.50	.007	.500
1444	#2/0 (37)	0.50	.007	.540

STANDARD PUT-UP: #16 Thru #6—500 ft. #4 & LARGER—100 ft.

† *Not listed as THHN*

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WEICO HOOK-UP WIRE PVC INSULATED - *KYNAR INSULATED

UL 1007
CSA TR-64
(PASSES UL VW-1 FLAME TEST)

DESCRIPTION:
Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation, .016" nominal Insulation Thickness

CHARACTERISTICS:
- Temperature Range: —10°C to +80°C
- Voltage Rating: 300 Volts

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
3024	24	7/32	.057
3022	22	7/30	.064
3020	20	10/30	.072
3018	18	16/30	.082
3016	16	26/30	.095
*3014	14	41/30	.110

STANDARD PUT-UPS: 100 ft., 1000 ft.

*UL1581

UL 1015
CSA TEW
(PASSES UL VW-1 FLAME TEST)

DESCRIPTION:
Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation, .032" nominal Insulation Thickness

CHARACTERISTICS:
- Temperature Range: —20°C to +105°C
- Voltage Rating: 600 Volts

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
3222	22	7/30	.095
3220	20	10/30	.102
3218	18	16/30	.112
3216	16	26/30	.125
3214	14	41/30	.142
3212	12	65/30	.156
3210	10	105/30	.184
*3208	8	133/29	.265
**3206	6	133/27	.341

STANDARD PUT-UPS: 100 ft., 1000 ft.

*UL1028
**UL1283

UL 1061 SEMI-RIGID
CSA SR-PVC
(PASSES UL VW-FLAME TEST)

DESCRIPTION:
Stranded Tinned Copper, Color Coded Semi-Rigid Polyvinylchloride Insulation

CHARACTERISTICS:
- Temperature Range: —10°C to +80°C
- Voltage Rating: 300 Volts

APPLICATIONS:
Internal Wiring of Computers, Electric bookkeeping, Accounting machines, and other office and Control Equipment.

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
3326	26	7/34	.010	.038
3324	24	7/32	.010	.042
3322	22	7/30	.010	.048
3320	20	7/28	.010	.056
3318	18	7/26	.010	.068

STANDARD PUT-UPS: 100 ft., 1000 ft.

*KYNAR INSULATED
UL 1423
SOLID CONDUCTOR
(PASSES UL VW-1 FLAME TEST)

DESCRIPTION:
Solid, Silver-Plated, Oxygen-Free, High Conductivity (OFHC) Copper Conductor, Kynar Insulated

CHARACTERISTICS:
- Temperature Rating: +125°C (UL Rated at 105°C)
- High Cut-Thru and Abrasion Resistance

WEICO NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2030	30	Solid	.005	.019
2028	28	Solid	.005	.023
2026	26	Solid	.005	.026
2024	24	Solid	.005	.030

STANDARD PUT-UPS: 1000 ft. *Registered Trademark of Pennwalt*

COLORS: 0 = Black 1 = Brown 2 = Red 3 = Orange 4 = Yellow 5 = Green 6 = Blue 7 = Violet 8 = Gray 9 = White Stripes**

***STRIPES: Any of the above colors are available in any combination of stripes up to a maximum of three stripes.*

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WEICO HOOK-UP WIRE * "TEFLON" INSULATED

MIL-W-22759/11
600V

DESCRIPTION:
Stranded Silver Plated Copper,
Extruded TFE Teflon* Insulation

CHARACTERISTICS:
- Temperature Rating: +200°C.
- Voltage Rating: 600 Volts.
- Printed with Military Part Number, & Manufacturer's Code Identification

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRANDING	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2428	M22759/11-28-X	28	7/36	.009	.033
2426/19	M22759/11-26-X	26	19/38	.010	.038
2424/19	M22759/11-24-X	24	19/36	.010	.043
2422/19	M22759/11-22-X	22	19/34	.010	.049
2420/19	M22759/11-20-X	20	19/32	.010	.058
2418/19	M22759/11-18-X	18	19/30	.010	.068
2416/19	M22759/11-16-X	16	19/29	.011	.075
2414/19	M22759/11-14-X	14	19/27	.012	.090
2412/19	M22759/11-12-X	12	19/25	.014	.111
2410/19	M22759/11-10-X	10	37/26	.016	.139

MIL-W-16878
TYPE E - 600V
1213

DESCRIPTION:
Stranded Silver Plated Copper,
Extruded TFE Teflon Insulation

CHARACTERISTICS:
- Temperature Rating:
  MIL-W-16878: —60°C to +200°C
  UL 1213: +105°C
- Voltage Rating:
  MIL-W-16878 600 Volts
  UL 1213: Not Rated

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2132	M16878/4BAB-X	32	7/40	.010	.030
2130	M16878/4BBB-X	30	7/38	.010	.032
2128	M16878/4BCB-X	28	7/36	.010	.036
2128/19	M16878/4BCE-X	28	19/40	.010	.036
2126	M16878/4BDB-X	26	7/34	.010	.040
2126/19	M16878/4BDE-X	26	19/38	.010	.041
2124	M16878/4BEB-X	24	7/32	.010	.044
2124/19	M16878/4BEE-X	24	19/36	.010	.045
2122	M16878/4BFB-X	22	7/30	.010	.050
2122/19	M16878/4BFE-X	22	19/34	.010	.051
2120	M16878/4BGB-X	20	7/28	.010	.058
2120/19	M16878/4BGE-X	20	19/32	.010	.059
2118	M16878/4BHB-X	18	7/26	.010	.068
2118/19	M16878/4BHE-X	18	19/30	.010	.070
2116/19	M16878/4BJE-X	16	19/29	.010	.077
2114/19	M16878/4BKE-X	14	19/27	.012	.094
2112/19†	M16878/4BLE-X	12	19/25	.012	.113
2110/19†	M16878/4BMG-X	10	37/26	.012	.134

† Not UL listed

MIL-W-16878
SOLID CONDUCTOR
TYPE E - 600V

DESCRIPTION:
Solid, Stranded Silver Plated Copper,
Extruded TFE Teflon Insulation

CHARACTERISTICS:
- Temperature Rating: —60°C to +200°C
- Voltage Rating: 600 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2830	M16878/4BBA-X	30	Solid	.010	.030
2828	M16878/4BCA-X	28	Solid	.010	.033
2826	M16878/4BDA-X	26	Solid	.010	.036
2824	M16878/4BEA-X	24	Solid	.010	.040
2822	M16878/4BFA-X	22	Solid	.010	.045
2820	M16878/4BGA-X	20	Solid	.010	.052
2818	M16878/4BHA-X	18	Solid	.010	.060

COLORS: 0 = Black 2 = Red 4 = Yellow 6 = Blue 8 = Gray Stripes**
1 = Brown 3 = Orange 5 = Green 7 = Violet 9 = White

X Denotes 0-9 color coding Standard Put-Ups: 100 ft., 1000 ft.

**DuPont 's Registered Trademark. **STRIPES: Any of the above colors are available in any combination of stripes up to a maximum of three stripes.*

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WEICO HOOK-UP WIRE *"TEFLON" INSULATED

MIL-W-16878 TYPE ET - 250V

(PASSES UL VW-1 FLAME TEST)

UL 1371

DESCRIPTION:
Stranded Silver Plated Copper,
Extruded TFE Teflon Insulation

CHARACTERISTICS:
- Temperature Rating: —60°C to +200°C
- Voltage Rating: 250 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2332	M16878/6BAB-X	32	7/40	.006	.021
2330	M16878/6BBB-X	30	7/38	.006	.024
2328	M16878/6BCB-X	28	7/36	.006	.027
2328/19	M16878/6BCE-X	28	19/40	.006	.027
2326	M16878/6BDB-X	26	7/34	.006	.031
2326/19	M16878/6BDE-X	26	19/38	.006	.032
2324	M16878/6BEB-X	24	7/32	.006	.036
2324/19	M16878/6BEE-X	24	19/36	.006	.037
2322	M16878/6BFB-X	22	7/30	.006	.042
2322/19	M16878/6BFE-X	22	19/34	.006	.044

MIL-W-16878 SOLID CONDUCTOR TYPE ET - 250V

(PASSES UL WV-1 FLAME TEST)

DESCRIPTION:
Solid Silver Plated Copper,
Extruded TFE Teflon Insulation

CHARACTERISTICS:
- Temperature Range: —60°C to +200°C
- Voltage Rating: 250 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2932	MILW16878/6BAA-X	32	Solid	.006	.019
2930	MILW16878/6BBA-X	30	Solid	.006	.022
2928	MILW16878/6BCA-X	28	Solid	.006	.025
2926	MILW16878/6BDA-X	26	Solid	.006	.028
2924	MILW16878/6BEA-X	24	Solid	.006	.032

MIL-W-16878 TYPE EE-1000V

UL 1180

DESCRIPTION:
Stranded Silver Plated Copper,
Extruded TFE Teflon Insulation

CHARACTERISTICS:
- Temperature Rating
  MIL-W-16878: —60° to +200°C
  UL 1180: +200°C
- Voltage Rating
  MIL-W-16878: 1000 Volts
  UL 1180: 300 Volts

WEICO NO.	MILITARY NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D. (INCHES)
2224	M16878/5BEB-X	24	7/32	.015	.054
2224/19	M16878/5BEE-X	24	19/36	.015	.055
2222	M16878/5BFB-X	22	7/30	.015	.060
2222/19	M16878/5BFE-X	22	19/32	.015	.062
2220	M18678/5BGB-X	20	7/28	.015	.068
2220/19	M16878/5BGE-X	20	19/32	.015	.070
2218/19†	M18678/5BHE-X	18	19/30	.015	.080
2216/19†	M16878/5BJE-X	16	19/29	.015	.089
2214/19†	M16878/5BKE-X	14	19/27	.017	.106
2212/19†	M16878/5BLE-X	12	19/25	.017	.124
2210†	M16878/5BMG-X	10	37/26	.017	.145
2208†	M16878/22BNL-X	8	133/29	.020	.210
2206†	M16878/22BPL-X	6	133/27	.020	.252
2204†	M16878/22BRL-X	4	133/25	.020	.315

NOTE: AWG 18-10 must be surface marked to comply with UL, please specify when ordering.

† Not UL listed

COLORS: 0 = Black 1 = Brown 2 = Red 3 = Orange 4 = Yellow 5 = Green 6 = Blue 7 = Violet 8 = Gray 9 = White Stripes**

X Denotes 0-9 color coding Standard Put-Ups: 100 ft., 1000 ft.

**DuPont's Registered Trademark **STRIPES: Any of the above colors are available in any combination of stripes up to a maximum of three stripes.*

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

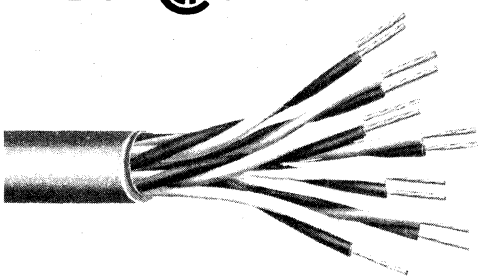
COMMUNICATION AND CONTROL CABLE

MULTIPAIR UNSHIELDED 80°-300V-PVC 22 AND 18 GAUGE

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

2464 S-R PVC



DESCRIPTION:
Each Conductor Solid or Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation. Conductors Twisted into Pairs, Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Rating: —20°C to +80°C
- Voltage Rating: 300 Volts

22 AWG-SOLID CONDUCTORS

WEICO NO.	NO. OF PAIRS	NO. OF COND.	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
7102	1	2	.032	.150
7104	2	4	.032	.209
7106	3	6	.032	.244
7108	4	8	.032	.259
7110	5	10	.040	.307
7112	6	12	.035	.305
7118	9	18	.037	.354
7122	11	22	.037	.369
7126	13	26	.037	.394
7130	15	30	.040	.405
7132	16	32	.040	.425
7138	19	38	.040	.430
7146	23	46	.040	.495
7154	27	54	.045	.535

22 AWG (7/30)-STRANDED CONDUCTORS

7002	1	2	.032	.165
7004	2	4	.032	.238
7006	3	6	.032	.284
7008	4	8	.032	.299
7010	5	10	.032	.304
7012	6	12	.035	.320
7018	9	18	.037	.389
7022	11	22	.035	.400
7024	12	24	.040	.425
7030	15	30	.040	.440
7038	19	38	.040	.505
7046	23	46	.045	.555
7054	27	54	.045	.580
7054/51	51	102	.045	.800

18 AWG (16/30)-STRANDED CONDUCTORS

7202	1	2	.032	.222
7204	2	4	.035	.287
7206	3	6	.037	.362
7208	4	8	.040	.358
7210	5	10	.050	.416
7212	6	12	.050	.475
7216	8	16	.050	.478
7218	9	18	.055	.575
7224	12	24	.055	.675
7230	15	30	.060	.785
7238	19	38	.070	.865
7254	27	54	.070	.965

COLOR CODE: CONSULT OUR FACTORY

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

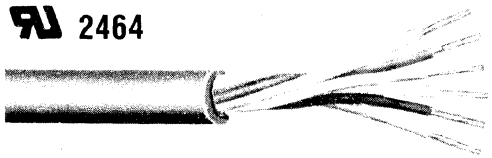
WEICO COMMUNICATION AND CONTROL CABLE

MULTICONDUCTOR— UNSHIELDED 80°C-300V-PVC

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

UL 2464



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation, Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Range: —20°C to +80°C
- Voltage Rating: 300 Volts (UL)

COLOR CODE: CONSULT OUR FACTORY

MULTI-CONDUCTOR 22-AWG (7/30) NOM. INS. THICKNESS .010

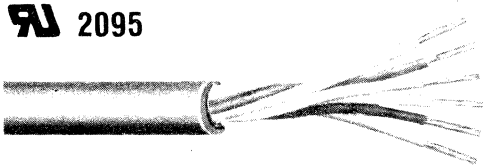
WEICO NO.	NO. OF COND.	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
4002	2	.032	.164
4003	3	.032	.169
4004	4	.032	.194
4005	5	.032	.199
4006	6	.032	.209
4007	7	.032	.214
4008	8	.032	.224
4009	9	.032	.249
4010	10	.032	.259
4012	12	.032	.279
4015	15	.032	.304
4020	20	.032	.324
4025	25	.032	.364
4030	30	.032	.379
4040	40	.032	.439
4050	50	.035	.500
4060	60	.035	.530

MULTICONDUCTOR— UNSHIELDED 80°C-300V-PVC

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

UL 2095



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded. Polyvinylchloride Insulation, Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Rating: —20°C to +80°C
- Voltage Rating: 300 Volts

MULTI-CONDUCTOR: NOM. INSULATION THICKNESS .016

WEICO NO.	NO. OF COND.	CONDUCTOR AWG	CONDUCTOR STRAND	NOM. JKT. THICKNESS (INCHES)	NOM. O.D. (INCHES)
4002/20	2	20	10/30	.020	.180
4003/20	3	20	10/30	.020	.190
4004/20	4	20	10/30	.020	.215
4005/20	5	20	10/30	.020	.233
4006/20	6	20	10/30	.020	.255
4007/20	7	20	10/30	.020	.255
4008/20	8	20	10/30	.020	.270
4009/20	9	20	10/30	.020	.300
4010/20	10	20	10/30	.020	.335
4012/20	12	20	10/30	.020	.350
4015/20	15	20	10/30	.030	.395
4002/18	2	18	16/30	.020	.200
4003/18	3	18	16/30	.020	.210
4004/18	4	18	16/30	.020	.240
4005/18	5	18	16/30	.020	.262
4006/18	6	18	16/30	.020	.290
4007/18	7	18	16/30	.020	.286
4008/18	8	18	16/30	.025	.315
4009/18	9	18	16/30	.025	.346
4010/18	10	18	16/30	.025	.370
4012/18	12	18	16/30	.025	.385
4015/18	15	18	16/30	.030	.445
4019/18	19	18	16/30	.030	.470
4025/18	25	18	16/30	.035	.558
4002/16	2	16	26/30	.020	.225
4003/16	3	16	26/30	.020	.245
4004/16	4	16	26/30	.020	.270

COLOR CODE: CONSULT OUR FACTORY

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

WEICO COMMUNICATION AND CONTROL CABLE

MULTICONDUCTOR 80°C-300V-PVC

CL2 RATED

OSHA ACCEPTABLE

(PASSES UL VW-1 FLAME TEST)

UL 2464 CSA CERTIFIED

DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation, Gray Polyvinylchloride Jacket Overall.

- PVC Insulation UL 1061, CSA SR-PVC;
- Clear Mylar Tape Wrap .001"
- Jacket Print: CSA AWM SR-PVC 80°C 300 Volts

CHARACTERISTICS:
- Temperature Range: —20°C to +80°C
- Voltage Rating: 300 Volts (UL)

22-AWG (7/30)

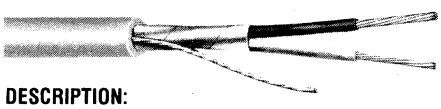
WEICO NO.	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
4102	2	.032	.170
4103	3	.032	.180
4104	4	.032	.195
4106	6	.032	.225
4108	8	.032	.240
4110	10	.032	.270
4115	15	.032	.300
4120	20	.032	.340
4125	25	.032	.375
4130	30	.032	.400
4140	40	.032	.445
4150	50	.032	.485
4160	60	.032	.525

COLOR CODE: CONSULT OUR FACTORY

MULTICONDUCTOR FOIL SHIELD 60°C-PE/PVC-300V

CL2 RATED

UL *2092 2093 2094



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded Polyethylene Insulation, Conductors Twisted, Wrapped Mylar Supported Aluminum Foil Shield, Drain Wire, Gray Polyvinylchloride Jacket Overall.

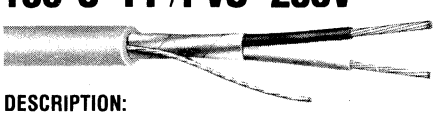
CHARACTERISTICS;
- Temperature Range: —20°C to +80°C (UL 60° C)
- Voltage Rating: 300 Volts
- Small Cable Diameter
- 100% Shield Coverage

WEICO NO.	NO. OF COND.	CONDUCTOR AWG.	CONDUCTOR STRAND	NOM. INS. THICKNESS (INCHES)	NOM. WALL THICKNESS (INCHES)	NOM. O.D. (INCHES)	COND. COLOR CODE
9201	2	24	7/32	.016	.020	.160	1,3
9202	2	22	7/30	.016	.020	.170	1,3
9203	2	22	7/30	.016	.020	.170	1,2
9204	3	22	7/30	.016	.020	.185	1,2,3
9205	4	22	7/30	.016	.020	.210	1,2,3,4
9206	2	20	10/30	.016	.020	.186	1,3
9207	2	20	10/30	.016	.020	.186	1,2
9208	3	20	10/30	.016	.020	.205	1,2,3
9209	4	20	10/30	.016	.020	.225	1,2,3,4
9210	2	18	16/30	.016	.020	.210	1,3
9211	2	18	16/30	.016	.020	.210	1,2
9212	3	18	16/30	.016	.020	.230	1,2,3
9214	4	18	16/30	.016	.020	.255	1,2,3,4
9215	2	16	26/30	.016	.020	.245	1,2
9216	3	16	26/30	.016	.020	.270	1,2,3

**2 Cond.—UL 2092, 3 Cond.—UL 2093, 4 Cond.—UL 2094*

COLORS: 1 = Black 2 = Red 3 = Clear 4 = Green

MULTICONDUCTOR - FOIL SHIELD 105°C-PP/PVC-200V



DESCRIPTION:
Conductor, Stranded or Solid Tinned Copper. Insulation, Color Coded Polypropylene (PP). Shield, Aluminum/ Polyester Tape, Foil Facing Inward (100% Coverage). Drain Wire, 22 AWG Tinned Copper. Jacket, Gray PVC

CHARACTERISTICS:
- Temperature Range: —20°C to +105°C
- Voltage Rating: 200 Volts

Insulation Thickness 0.008"

WEICO NO.	NO. OF COND.	CONDUCTOR AWG	CONDUCTOR STRAND	JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
9217	2	22	Solid	.018	0.120
9218	2	22	7/30	.020	0.130

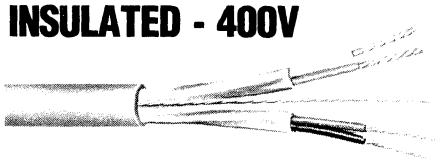
COLOR CODE: Black, Red

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

WEICO COMMUNICATION AND CONTROL CABLE

MULTIPAIR 80°C - POLYPROPYLENE INSULATED - 400V



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Polypropylene insulated, twisted into pairs (Black with Red and Green with White). Each Pair Aluminum Polyester Shielded with Stranded Tinned Copper Common Drain Wire, Overall Gray PVC Jacket.

CHARACTERISTICS:
- Temperature Range:—20°C to +80°C
- Suggested Voltage Rating: 400 Volts

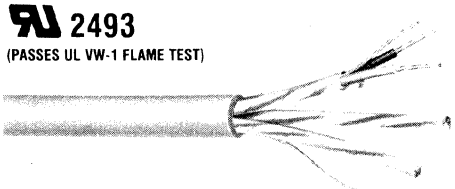
22—STRANDED (7/30)

WEICO NO.	NO. OF PAIRS	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
8004	2	4	.020	.165

INDIVIDUALLY FOIL SHIELDED 80°C - PP/PVC 300, 400V

UL 2493

(PASSES UL VW-1 FLAME TEST)



DESCRIPTION:
Each Conductor Tinned Copper, Color Coded Polypropylene Conductors Twisted into Pairs, Mylar-Supported Aluminum Foil Shield, Aluminum Facing Inward, Stranded Tinned Copper Drain Wire, Gray Polyvinylchloride Jacket.

CHARACTERISTICS:
- Temperature Range: —20°C to +80°C
- Suggested Working Voltage:
  22 AWG—300V
  18 AWG—400V
- UL Does Not Specify Voltage

#22—SOLID NOM. INS. THICKNESS .013"

WEICO NO.	NO. OF PAIRS	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
8106	3	6	.037	.279
8112	6	12	.037	.379
8118	9	18	.040	425
8122	11	22	.040	.470
8130	15	30	.045	.525

#22—STRANDED (7/30) NOM. INS. THICKNESS .010"

8006	3	6	.048	.301
8012	6	12	.048	.401
8018	9	18	.048	.443
8022	11	22	.048	.486
8024	12	24	.048	.486
8030	15	30	.065	.580
8034	17	34	.065	.615
8038	19	38	.065	.625
8054	27	54	.070	.745

#18—STRANDED (16/30) NOM. INS. THICKNESS .016"

8006/18	3	6	.048	.398
8012/18	6	12	.065	.570
8018/18	9	18	.065	.655
8024/18	12	24	.070	.750
8030/18	15	30	.070	.820

COLOR CODE: CONSULT OUR FACTORY

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

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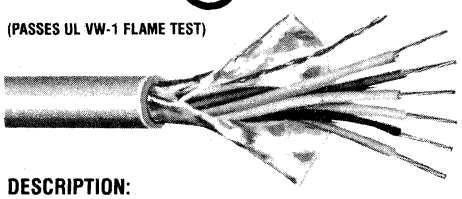
WEICO COMMUNICATION AND CONTROL CABLE

MULTICONDUCTOR OVERALL FOIL SHIELD 300V- 24 Gauge

CL2 RATED

2464 S-R PVC

(PASSES UL VW-1 FLAME TEST)



DESCRIPTION:
Each Conductor Tinned Copper, Color Coded Polyvinylchloride Insulation, Conductors Cabled. Overall Mylar Supported Aluminum Foil Shield, Stranded 24 Gauge Tinned Copper Drain Wire, Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Rating: —40°C to +80°C
- Suggested Working Voltage: 300 Volts
- 100% Shield Coverage

#24—STRANDED (7/32) NOM. INS. THICKNESS .010"

WEICO NO.	NO. OF CONDUCTORS	COLOR CODE	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
7503	3	D	.035	.168
7504	4	D	.035	.190
7505	5	D	.035	.195
7506	6	D	.035	.215
7507	7	D	.035	.215
7508	8	D	.035	.220
7509	9	D	.035	.250
7510	10	D	.035	.250
7515	15	E	.035	.280
7520	20	E	.035	.320
7525	25	E	.040	.360
7530	30	E	.040	.380
7540	40	E	.040	.430
7550	50	E	.045	.490

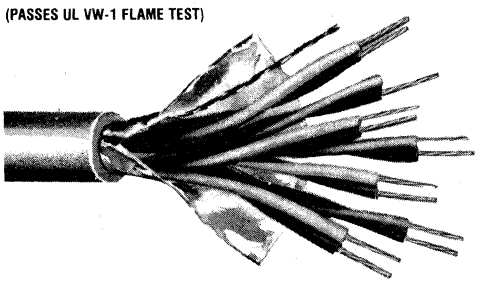
COLOR CODE: CONSULT OUR FACTORY

MULTIPAIR OVERALL FOIL SHIELD 300V-24 Gauge

CL2 RATED

2464 S-R PVC

(PASSES UL VW-1 FLAME TEST)



DESCRIPTION:
Each Conductor Tinned Copper, Color Coded Polyvinylchloride Insulation, Conductors Twisted into Pairs. Overall Mylar Supported Aluminum Foil Shield, Stranded Tinned Copper Drain Wire, Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Rating: —40°C to +80°C
- Suggested Working Voltage: 300 Volts
- 100% Shield Coverage

#24—STRANDED (7/32) NOM. INS. THICKNESS .010"

WEICO NO.	NO. OF PAIRS	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
7302	1	2	.032	.156
7304	2	4	.032	.222
7306	3	6	.032	.232
7308	4	8	.032	.265
7310	5	10	.035	.295
7312	6	12	.035	.295
7314	7	14	.035	.300
7316	8	16	.035	.330
7318	9	18	.035	.340
7320	10	20	.040	.380
7330	15	30	.040	.425
7338	19	38	.040	.460
7350	25	50	.045	.515
7300	50	100	.050	.700

COLOR CODE: CONSULT OUR FACTORY

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

WEICO COMMUNICATION AND CONTROL CABLE

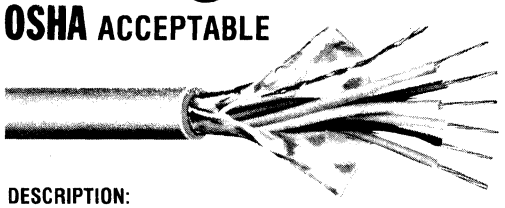
MULTICONDUCTOR FOIL SHIELD 300V-22 GAGE

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

2464 SR PVC

OSHA ACCEPTABLE



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded Polyvinylchloride (UL Style 1061) Insulated. Overall Aluminum/ Polyester Shield with Stranded Tinned Copper Drain Wire, Nylon Rip Cord for Ease of Jacket Stripping, Gray PVC Jacket Overall.

CHARACTERTISTICS:
- Temperature Range: —40°C to +80°C
- Suggested Working Voltage: 300 Volts
- 100% Shield Coverage

22 AWG 7/30 Insulation Thickness .010"

WEICO NO.	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
7602	2	.032	.180
7603	3	.032	.190
7604	4	.032	.210
7606	6	.032	.230
7608	8	.032	.260
7610	10	.032	.280
7615	15	.032	.320
7620	20	.032	.350
7625	25	.032	.380
7630	30	.032	.410
7640	40	.032	.460
7650	50	.032	.500
7660	60	.032	.540
7670	70	.053	.620
7680	80	.053	.650
7690	90	.053	.690
7600	100	.053	.720

COLOR CODE: CONSULT OUR FACTORY

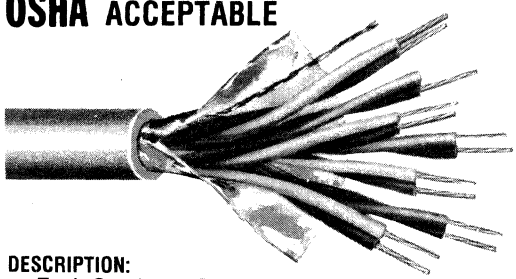
MULTIPAIR, FOIL SHIELD 300V-22 GAGE

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

2464 SR PVC

OSHA ACCEPTABLE



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded Polyvinylchloride (UL Style 1061) Insulated, Twisted into Pairs, Overall Aluminum/Polyester Shield with Stranded Tinned Copper Drain Wire, Nylon Rip Cord for Ease of Jacket Stripping, Gray PVC Jacket Overall.

CHARACTERISTICS:
- Temperature Range: —40°C to +80°C
- Suggested Working Voltage: 300 Volts
- 100% Shield Coverage

22 AWG 7/30 INSULATION THICKNESS .010"

WEICO NO.	NO. OF PAIRS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
7702	1	.032	.180
7704	2	.032	.230
7706	3	.032	.260
7708	4	.032	.280
7710	5	.032	.310
7712	6	.032	.330
7718	9	.032	.380
7722	11	.032	.410
7730	15	.032	.460
7738	19	.032	.500
7754	27	.053	.610
7701	51	.083	.860

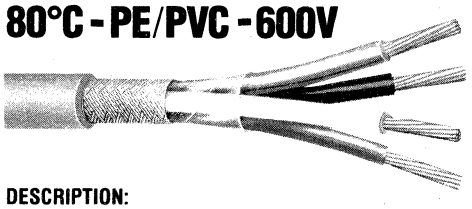
COLOR CODE: CONSULT OUR FACTORY

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

WEICO COMMUNICATION AND CONTROL CABLE

MULTICONDUCTOR BRAIDED SHIELD 80°C - PE/PVC - 600V



DESCRIPTION:
Each Conductor Stranded Tinned Copper, Color Coded Polyethylene Insulation, Cabled with Fillers Where Necessary, Mylar Wrap, Braided Tinned Copper Shield, Gray Polyvinychloride Jacket Overall.

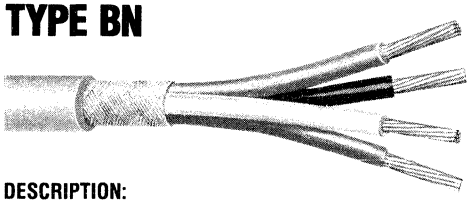
CHARACTERISTICS:
- Temperature Range: —20°C to +80°C
- Suggested Working Voltage: 600 Volts

20 AWG-26/34 STRANDED CONDUCTOR—NOMINAL INS. THICKNESS .015″

WEICO NO.	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
9401	2	.030	.245
9402	3	.035	.250
9403	4	.035	.260
9404	5	.035	.275
9405	6	.035	.300
9406	8	.035	.330
9407	10	.035	.375
9408	12	.035	.380
9409	15	.035	.410
9410	20	.035	.455

COLOR CODE: CONSULT OUR FACTORY

MULTICONDUCTOR BRAIDED SHIELDED 105°C - PVC/NYLON - 600V MIL-W-16878 TYPE BN



DESCRIPTION:
Each Conductor Stranded Tinned Copper, .010″ Polyvinylchloride Insulation, Color Coded, Clear Nylon (Polyamide) Jacket, Conductors Cabled, Braided Tinned Copper Shield 90% Coverage, Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Rating: —55°C to +105°C
- Voltage Rating: 600 Volts

MIL-W-16878 TYPE B CONDUCTORS
NOMINAL INS. THICKNESS—.010″—NOMINAL NYLON THICKNESS .003″

WEICO NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. JKT. THICKNESS (INCHES)	NOM. O.D. (INCHES)
6126	1	26	7/34	.010	.087
6226	2	26	7/34	.014	.138
6326	3	26	7/34	.014	.142
6426	4	26	7/34	.016	.162
6124	1	24	19/36	.010	.092
6224	2	24	19/36	.016	.152
6324	3	24	19/36	.016	.161
6424	4	24	19/36	.017	.172
6122	1	22	19/34	.010	.100
6222	2	22	19/34	.016	.168
6322	3	22	19/34	.017	.178
6422	4	22	19/34	.019	.194
6120	1	20	19/32	.010	.106
6220	2	20	19/32	.019	.186
6320	3	20	19/32	.019	.196
6420	4	20	19/32	.021	.218
6118	1	18	19/30	.012	.120
6218	2	18	19/30	.021	.210
6318	3	18	19/30	.022	.227
6418	4	18	19/30	.023	.250
6116	1	16	19/29	.016	.137
6216	2	16	19/29	.023	.236
6316	3	16	19/29	.023	.240
6416	4	16	19/29	.025	.274

COLORS: 1 = White 2 = Black 3 = Red 4 = Green

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

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COMMUNICATION AND CONTROL CABLE

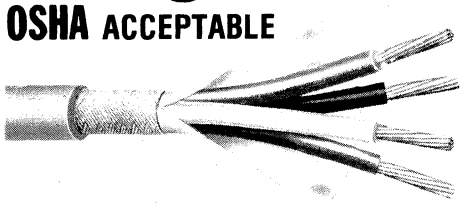
MULTICONDUCTOR DUAL SHIELDED 80°C-300V

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

UL 2464 CSA SR PVC

OSHA ACCEPTABLE



DESCRIPTION:

Each Conductor Stranded Tinned Copper, Color Coded Polyvinylchloride Insulation, Aluminum Foil/Polyester/Aluminum Foil with Drain Wire, Overall Braided Tinned Copper Shield, Nylon Rip Cord, for Ease of Jacket Stripping, Gray PVC Jacket overall:

- Meets FCC Docket 20780
- MIL-STDS 461 and MIL STD 462B

#22 STRANDED (7/30) NOM. INS. THICKNESS .009"

WEICO NO.	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
9102	2	.032	.190
9103	3	.032	.200
9104	4	.032	.215
9106	6	.032	.245
9108	8	.032	.255
9110	10	.032	.290
9115	15	.032	.330
9120	20	.032	.360
9125	25	.032	.400
9130	30	.032	.420
9140	40	.032	.465
9150	50	.032	.510
9160	60	.032	.560
9170	70	.050	.635
9180	80	.050	.660
9190	90	.050	.690
9100	100	.050	.745

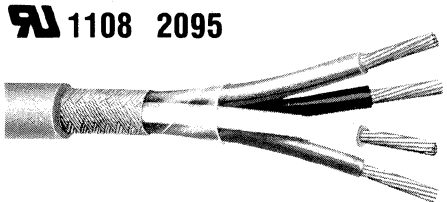
COLOR CODE: CONSULT OUR FACTORY

MULTICONDUCTOR, BRAID SHIELD 80°C-300V

CL2 RATED

(PASSES UL VW-1 FLAME TEST)

UL 1108 2095



DESCRIPTION:

Each Conductor Stranded Tinned Copper, Color Coded Polyvinylchloride Insulated, Tinned Copper Braided Shield, Gray PVC Jacket Overall.

CHARACTERISTICS:

- Temperature Rating: —20°C to +80°C
- Voltage Rating: 300 Volts

INSULATION THICKNESS .016"

WEICO NO.	NO. OF CONDUCTORS	CONDUCTOR AWG	CONDUCTOR STRAND	NOM. JACKET THICKNESS (INCHES)	NOM.O.D. (INCHES)
9450	1	22	7/30	.020	.120
9451	2	22	7/30	.020	.180
9452	3	22	7/30	.020	.200
9453	4	22	7/30	.020	.210
9454	1	20	10/30	.020	.130
9455	2	20	10/30	.020	.200
9456	3	20	10/30	.020	.220
9457	4	20	10/30	.020	.230
9458	1	18	16/30	.020	.140
9459	2	18	16/30	.020	.230
9460	3	18	16/30	.020	.240
9461	4	18	16/30	.020	.250
9462	2	16	26/30	.020	.250
9463	3	16	26/30	.020	.250

COLOR CODE: CONSULT OUR FACTORY *Single Conductor UL 1108, Multi Conductor UL 2095*

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

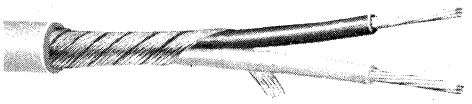
COMMUNICATION AND CONTROL CABLE

MULTICONDUCTOR SPIRAL SHIELD 80°C-300V-PVC

CL2 RATED

1108 2095

(PASSES UL VW-1 FLAME TEST)



DESCRIPTION:
Each Conductor Stranded or Solid Tinned Copper, Color Coded Polyvinylchloride Insulation, Spiral Wrapped Bare Copper Shield. Nom. .020" Gray Polyvinylchloride Jacket Overall.

CHARACTERISTICS:
- Temperature Range: —20°C to +80°C
- 95% Shield Coverage
- Suggested Working Voltage: 300 Volts
- Excellent for Production Line Work, Use of Spiral Shield Makes Shield Termination Extremely Simple and Fast

COLORS: 1 = Black 3 = White 5 = Yellow
2 = Red 4 = Green 6 = Blue

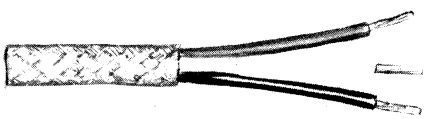
WEICO NO.	NO. OF CONDUCTORS	CONDUCTOR AWG	CONDUCTOR STRAND	NOM. INS. THICKNESS (INCHES)	NOM.O.D. (INCHES)
9301	2	22	Solid	.016	.170
9302	1	22	7/30	.016	.115
9303	2	22	7/30	.016	.175
9304	3	22	7/30	.016	.190
9305	4	22	7/30	.016	.200
9306	6	22	7/30	.016	.235
9307	1	20	10/30	.016	.130
9308	2	20	10/30	.016	.195
9309	3	20	10/30	.016	.210
9310	4	20	10/30	.016	.225
9311	6	20	10/30	.016	.265
9312	1	18	16/30	.016	.135
9314	2	18	16/30	.016	.230
9315	3	18	16/30	.016	.235
9316	4	18	16/30	.016	.245
9317	2	16	26/30	.016	.240
9318	3	16	26/30	.016	.245
9319*	2	14	41/30	.020	.285
9320*	3	14	41/30	.020	.290

Single Conductor UL 1108, Multi Conductor UL 2095

** Not UL Recognized Not CL2*

WEICO COMMUNICATION AND CONTROL CABLE

BRAIDED SHIELD
**"TEFLON" (TFE)
TAPE WRAPPED JACKET
200°C-600V
MIL-W-16878
TYPE E



DESCRIPTION:
Each Conductor Stranded Silver Plated Copper, Type E Extruded .010" TFE Teflon Insulation, Color Coded, Cabled, Braided Silver Plated Copper Shield 90% Coverage, Sintered Wrapped White Teflon Tape.

CHARACTERISTICS:
- Temperature Range: —65°C to +200°C
- Voltage Rating: 600 Volts

COLORS: 1 = White 2 = Black 3 = Red 4 = Green

DuPont's Registered Trademark

WEICO NO.	NO. OF COND.	COND. SIZE	COND. STRAND	NOM. JKT. (INCHES)	NOM. O.D. AT HIGH POINT (INCHES)	NOM. CAP IN MMF SHIELD TO COND.	NOM. CAP IN MMF COND. TO COND.
5128/7	1	28	7/36	.010	.079	35	—
5228/7	2	28	7/36	.010	.121	32	18
5126/7	1	26	7/34	.010	.083	40	—
5226/7	2	26	7/34	.010	.129	36	20
5326/7	3	26	7/34	.010	.129	33	19
5126	1	26	19/38	.010	.083	40	—
5226	2	26	19/38	.010	.129	36	20
5326	3	26	19/38	.010	.129	33	19
5426	4	26	19/38	.010	.146	32	18
5124	1	24	19/36	.012	.095	45	—
5224	2	24	19/36	.012	.140	35	25
5324	3	24	19/36	.012	.147	35	20
5424	4	24	19/36	.012	.159	35	20
5122	1	22	19/34	.012	.102	55	—
5222	2	22	19/34	.012	.154	45	25
5322	3	22	19/34	.012	.162	35	25
5422	4	22	19/34	.012	.176	35	25
5120	1	20	19/32	.012	.110	55	—
5220	2	20	19/32	.012	.170	95	25
5320	3	20	19/32	.012	.180	85	25
5420	4	20	19/32	.012	.195	140	30
5118	1	18	19/30	.012	.120	70	—
5218	2	18	19/30	.012	.190	60	35
5318	3	18	19/30	.012	.203	60	35
5418	4	18	19/30	.012	.220	55	35
5116	1	16	19/29	.012	.130	107	—
5216	2	16	19/29	.012	.210	67	25
5316	3	16	19/29	.012	.211	56	30
5416	4	16	19/29	.012	.243	54	29
5114	1	14	19/27	.012	.144	84	—
5214	2	14	19/27	.012	.239	61	34
5314	3	14	19/27	.012	.227	56	31
5112	1	12	19/25	.012	.164	96	—
5212	2	12	19/25	.012	.279	72	40
5312	3	12	19/25	.012	.265	61	34

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

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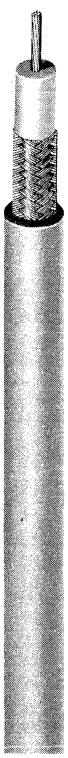
WEICO COMMUNICATION AND CONTROL CABLE

MIL-C-17 COAXIAL CABLE (POLY-ETHYLENE DIELECTRIC)



WEICO NO.	RG CABLE TYPE	JKT. O.D.	JKT. MAT	OUTER SHIELDS	INNER SHIELDS	DIELEC-TRIC O.D.	DIELEC-TRIC MAT	CENTER COND.	NOM. IMPED (OHMS)	NOM. CAP. MMFD/FT.	MAX. OPERAT-ING VOLT (RMS)	V.P. 0/0
		MECHANICAL SPECIFICATIONS							ELECTRICAL SPECIFICATIONS			
W006A	6A/U	.336	NCV	C	SC	.189	PE	CW	75	20	2700	65.9
W008	8/U	.415	V	—	C	.289	PE	C	52	29.5	5000	65.9
W008A	8A/U	.415	NCV	—	C	.295	PE	C	52	29.5	5000	65.9
W011	11/U	.415	V	—	C	.295	PE	TC	75	20.5	5000	65.9
W011A	11A/U	.412	NCV	—	C	.292	PE	TC	75	20.5	5000	65.9
W014A	14A/U	.558	NCV	C	C	.383	PE	C	52	29.5	7000	65.9
W058	58/U	.200	V	—	TC	.121	PE	C	53.5	28.5	1900	65.9
W058A	58/A/U	.199	V	—	TC	.120	PE	C	50	29.5	1900	65.9
W058C	58C/U	.199	NCV	—	TC	.120	PE	TC	50	29.5	1900	65.9
W059	59/U	.250	V	—	C	.150	PE	CW	73	21	2300	65.9
W059B	59B/U	.246	NCV	—	C	.150	PE	CW	75	20.5	2300	65.9
W062	62/U	.250	V	—	C	.151	SSP	CW	93	13.5	750	84.0
W062A	62A/U	.249	NCV	—	C	.151	SSP	CW	93	13.5	750	84.0
W063B	63B/U	.415	NCV	—	C	.295	SSP	CW	125	10	1000	84.0
W071B	71B/U	.250	BP	TC	C	.151	SSP	CW	93	13.5	750	84.0
W174	174/U	.105	NCV	—	TC	.060	PE	CW	50	30	1500	65.9
W212	212/U	.336	NCV	SC	SC	.189	PE	SC	50	29.5	3000	65.9

WEICO NO.	RG CABLE TYPE	ARMOR O.D.	JKT. O.D.	JKT. MAT	OUTER SHIELDS	INNER SHIELDS	DIELEC-TRIC O.D.	DIELEC-TRIC MAT	CENTER COND.	NOM. IMPED (OHMS)	NOM. CAP. MMFD/FT.	MAX. OPERAT-ING VOLT (RMS)	V.P. 0/0
			MECHANICAL SPECIFICATIONS							ELECTRICAL SPECIFICATIONS			
W213	213/U	—	.412	NCV	—	C	.292	PE	C	50	30.5	5000	65.9
W214	214/U	—	.432	NCV	SC	SC	.292	PE	SC	50	30.5	5000	65.9
W215	215/U	.475	.412	NCV	—	C	.292	PE	C	50	30.5	5000	65.9
W217	217/U	—	.555	NCV	C	C	.380	PE	C	50	30	7000	65.9
W218	218/U	—	.880	NCV	—	C	.690	PE	C	50	30	11000	65.9
W219	219/U	.945	.880	NCV	—	C	.690	PE	C	50	30	11000	65.9
W223	223/U	—	.216	NCV	SC	SC	.120	PE	SC	50	30	19000	65.9

C—Bare Copper
TC—Tinned Copper
SC—Silver Covered Copper
CW—Copper Covered Steel

PE—Solid Polyethylene
SSP—Semi Solid Polyethylene
BP—Black Polyethylene—Type IIIA
NP—Natural Polyethylene—Type III

V—Polyvinylchloride—Type 1
NCV—Non-Contaminating Polyvinychloride-Type IIA
All dimension Are Max. Except Where Indicated

MIL-C-17 COAXIAL CABLE ("TEFLON"* DIELECTRIC)

WEICO NO.	RG TYPE	COND.	NOM. WALL THICK	NOM. JKT. THICK	JACKET TYPE	MAX. O.D.	CAP. NOM.	IMPED. OHMS.	MAX. OPER. VOLTAGE
W142B	142B/U	1/.039	.039	.012	Extruded FEP	.200	28.5	50±2	1900
W178B	178B/U	7/.004	.012	.010	Extruded FEP	.075	27.9	50±2	1000
W179B	179B/U	7/.004	.021	.010	Extruded FEP	.105	20.4	75±3	1200
W180B	180B/U	7/.004	.045	.010	Extruded FEP	.145	15.3	93±2	850
W187A	187A/U	7/.004	.024	.012	Fused TFE Tape	.110	19.5	75±3	1200
W188A	188A/U	7/.0067	.020	.012	Fused TFE Tape	.110	27.5	50±2	1200
W195A	195A/U	7/.004	.045	.014	Fused TFE Tape	.155	14.5	95±3	1500
W196A	196A/U	7/.004	.011	.012	Fused TFE Tape	.080	28.5	50±2	1000
W302	302/U	1/.025	.061	.013	Extruded FEP	.201	29.0	50±2	2300
W316	316/U	7/.0067	.020	.007	Extruded FEP	.102	29.0	50±2	1200

*DuPont's Registered Trademark *Conductors Silver Plated Copperweld*

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

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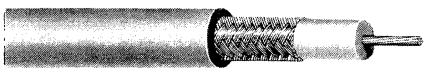
PLENUM CABLE, COAXIAL AND FIRE ALARM

COAXIAL-CL2P (NEC-725-2b)



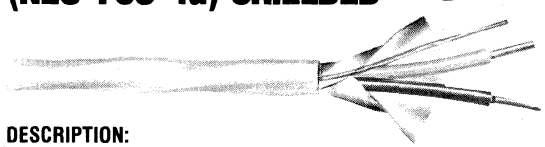
DESCRIPTION:
Fluoropolymer Coaxial Cables are made to the most exacting specifications in the wire and cable industry. WEICO'S designs and standards allow for dramatic improvements in critical data communications electrical characteristics' such as: signal speed, attenuation, and capacitance.

CHARACTERISTICS
- High Transmission Speed
- Allows Longer Cable Lengths In Computer Systems
- Can Be Installed In Air Ducts And Plenums Without Conduit
- UL Listed
- Temp. Range: —90°C to +200°C

WEICO NO.	RG TYPE	CENTER COND.	NOM. O.D. IN.	WEIGHT LBS/MFT	NOM. IMP. (OHM)	NOM. CAP. (PF/FT)	V.P. %
WP06	6	18 SOLID BC	.255	55.9	75	17	80
WP11	11	14 SOLID BC	.350	95	75	17	80
WP58	58	20 SOLID BC	.178	38.5	50	27	70
WP59	59	20 SOLID BCW	.196	31.05	75	17	80
WP60	59	22 SOLID BCW	.189	35.6	75	19	80
WP59D	59 DUAL	20 SOLID BCW	.206 x .457	70.5	75	17	80
WP60D	59 DUAL	23 SOLID BCW	.225 x .430	86	75	19	70
WP62	62	22 SOLID BCW	.198	29.9	93	13	83
WP01	TWINAX	20-7-B.C. 20-7-T.C.	.264	55.60	100	12	80
WP02	ETHERNET*	SOLID .085 T.C.	.375	128	50	26	80

*XEROX TRADEMARK

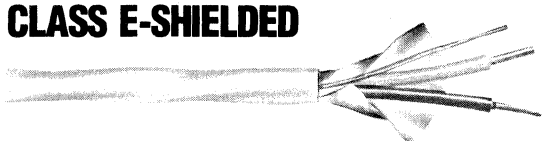
FIRE ALARM-FPLP (NEC-760-4d)-SHIELDED



WEICO NO.	NUMBER OF CONDUCTORS	GAUGE (AWG)	NOM. O.D. (INCHES)	WEIGHT LBS/MFT
9869	2	18	.200	34.5
9870	2	16	.220	42

DESCRIPTION:
Each Conductor Solid Tinned Copper, Color Coded Fluoropolymer Resin Insulated, Twisted Pair Overall Aluminum Foil Shield (100% coverage) Drain Wire, Fluoropolymer Jacket Overall.

FIRE ALARM-FPLP LOCAL LAW-5 CLASS E-SHIELDED



WEICO NO.	NUMBER OF CONDUCTORS	GAUGE (AWG)	NOM. O.D. (INCHES)	WEIGHT LBS/MFT
9871	2	18	.200	31.2
9872	2	16	.220	41.2

DESCRIPTION:
Each Conductor Solid Tinned Copper, Color Coded Fluoropolymer Resin Insulated, Twisted Pair, Overall Aluminum Foil Shield (100% coverage) Drain Wire, Fluoropolymer Jacket Overall.

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WEICO PLENUM CABLE

CL2P-(NEC-725-2b) (NON-CONDUIT) SHIELDED PAIRS

DESCRIPTION:
Each Conductor Stranded, Tinned Copper, Color Coded Fluoropolymer Resin Insulated, Conductors Twisted into Pairs, Overall Aluminum Foil Shield (100% coverage) Stranded Drain Wire, Fluoropolymer Jacket Overall.

PAIRED—SHIELDED

WEICO NO.	NUMBER OF PAIRS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9830	1	24	.120	9.80
9831	2	24	.159	14.10
9833	3	24	.170	21.35
9834	4	24	.184	26.75
9835	6	24	.221	37.35
9836	12½	24	.294	68.09
9837	25	24	.408	131.50

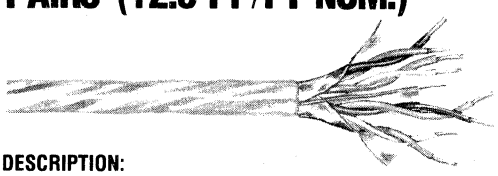
CL2P-(NEC-725-2b) (NON-CONDUIT) UNSHIELDED PAIRS

DESCRIPTION:
Each Conductor Stranded, Tinned Copper, Color Coded Fluoropolymer Resin Insulated, Conductors Twisted into Pairs, Fluoropolymer Jacket Overall.

PAIRED—UNSHIELDED

WEICO NO.	NUMBER OF PAIRS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9838	1	24	.110	9.30
9839	2	24	.155	14.00
9840	3	24	.165	18.95
9841	4	24	.179	24.10
9842	6	24	.217	34.50
9843	12½	24	.290	66.30
9844	25	24	.400	128.00

CL2P-(NEC-725-2b) (NON-CONDUIT) LOW CAPACITANCE- SHIELDED PAIRS (12.5 PF/FT NOM.)

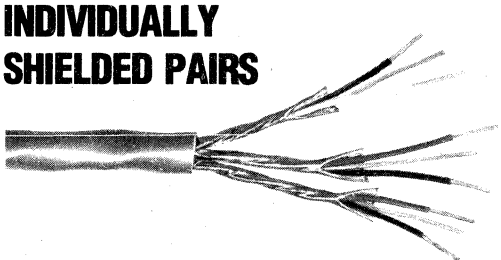


DESCRIPTION:
Each Conductor Stranded, Tinned Copper, Color Coded Fluoropolymer Resin Insulated, Conductors Twisted into Pairs, Overall Aluminum Foil Shield (100% coverage) Stranded Drain Wire, Fluoropolymer Jacket Overall.

PAIRED—SHIELDED

WEICO NO.	NUMBER OF PAIRS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9860	1	24	.140	11.00
9861	2	24	.178	18.60
9862	3	24	.190	24.35
9863	4	24	.208	30.35
9864	6	24	.250	42.65
9865	9	24	.295	60.25
9866	12½	24	.335	80.15

CL2P-(NEC-725-2b) (NON-CONDUIT) INDIVIDUALLY SHIELDED PAIRS



DESCRIPTION:
Each Conductor Stranded, Tinned Copper, Color Coded Fluorpolymer Resin Insulated, Conductors Twisted into Pairs, Each Pair Individually Aluminum Foil Shielded, Stranded Drain Wire, Fluoropolymer Jacket Overall.

PAIRED—SHIELDED

WEICO NO.	NUMBER OF PAIRS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9867	2	22	.167	23.45
9868	3	22	.244	38.00

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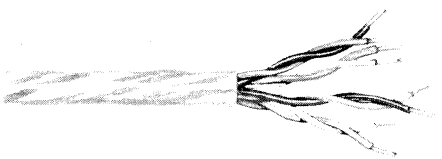
WEICO PLENUM CABLE

CL2P-(NEC-725-2b) (NON-CONDUIT) SHIELDED - UNSHIELDED, PAIRED - UNPAIRED



UNPAIRED—SHIELDED

WEICO NO.	NO. OF COND.	COND. AWG (STRANDING)	INSULATION THICKNESS (IN)	JACKET THICKNESS (IN)	NOM. O.D. (IN)	APPROX. WT/MFT (LBS)
9820	2	18 (SOLID)	.010	.020	.169	24
9821	2	16 (SOLID)	.010	.020	.189	28
9822	4	22 (SOLID)	.010	.020	.156	22
9823	4	18 (SOLID)	.010	.020	.190	41

UNPAIRED—UNSHIELDED

WEICO NO.	NO. OF COND.	COND. AWG (STRANDING)	INSULATION THICKNESS (IN)	JACKET THICKNESS (IN)	NOM. O.D. (IN)	APPROX. WT/MFT (LBS)
9824	2	18 (SOLID)	.010	.020	.162	23
9825	2	16 (SOLID)	.010	.020	.185	27
9826	4	18 (SOLID)	.010	.020	.186	37

PAIRED—UNSHIELDED

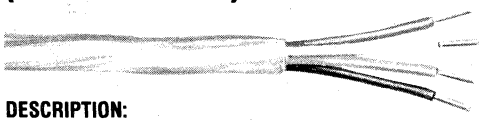
WEICO NO.	NO. OF PAIRS	COND. AWG (STRANDING)	INSULATION THICKNESS (IN)	JACKET THICKNESS (IN)	NOM. O.D. (IN)	APPROX. WT/MFT (LBS)
9828	2	22 (SOLID)	.010	.020	.205	22
9829	3	22 (SOLID)	.010	.020	.212	30

DESCRIPTION:
Conductors Tinned or Bare Copper Insulated with Fluoropolymer Resin, Conductors Paired or Cabled, Unshielded or Overall Foil Shield (100% Coverage), Drain Wire, Extruded Fluoropolymer Transparent Jacket Overall.

APPLICATION:
Computer Interconnect, Instrumentation and Control, Business Machines, and Remote Control Signaling.

WEICO PLENUM TELEPHONE CABLE

CMP-(NEC-800-3d) (NON-CONDUIT)



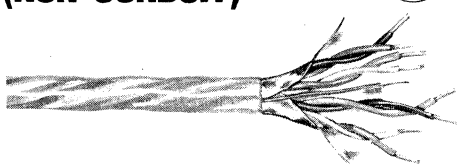
DESCRIPTION:
Each Conductor Solid Bare Copper, Color Coded Fluoropolymer Resin Insulated, Conductors Cabled, Extruded Fluoropolymer Jacket Overall.

APPLICATION:
General Intercommunications, Sound Systems, Industrial And Residential Telephone Service.

UNPAIRED—UNSHIELDED

WEICO NO.	NO. OF CONDUCTORS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9624	2	24	.123	11
9634	3	24	.130	14
9644	4	24	.139	16
9622	2	22	.131	12
9632	3	22	.137	15
9642	4	22	.151	18

CMP-(NEC-800-3d) (NON-CONDUIT)



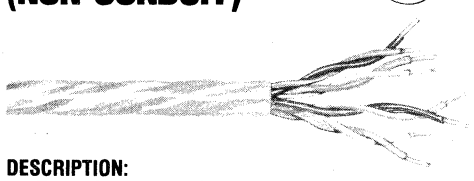
DESCRIPTION:
Each Conductor Solid Bare Copper, Color Coded Fluoropolymer Resin Insulated, Conductors Twisted into Pairs, Overall Aluminum Foil Shield (100% coverage) Stranded Drain Wire, Fluoropolymer Jacket Overall.

APPLICATION:
General Intercommunications, Sound Systems, Industrial And Residential Telephone Service.

PAIRED—SHIELDED

WEICO NO.	NUMBER OF PAIRS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9730	3	24	.141	15.5
9731	4	24	.150	18.65
9732	6	24	.180	25.75
9733	10	24	.248	51.25
9734	25	24	.317	90.15
9735	50	24	.464	168.00
9736	100	24	.611	323.43

CMP-(NEC-800-3d) (NON-CONDUIT)



DESCRIPTION:
Each Conductor Solid Bare Copper, Color Coded Fluoropolymer Resin Insulated, Conductors Twisted into Pairs, Fluoropolymer Jacket Overall.

APPLICATION:
General Intercommunications, Sound Systems, Industrial And Residential Telephone Service.

PAIRED—UNSHIELDED

WEICO P/N	NUMBER OF PAIRS	GAUGE (AWG)	NOM. O.D. (INCHES)	APPROX. LBS/MFT
9702	2	24	.118	10.50
9703	3	24	.131	12.25
9704	4	24	.142	15.65
9706	6	24	.155	22.35
9710	10	24	.245	50.00
9712	12	24	.253	53.00
9725	25	24	.311	86.75
9750	50	24	.459	166.00
9700	100	24	.605	321.43

COLOR CODE: Western Electric

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WEICO BRAID, TINNED COPPER

FLAT BRAID QQ-B-575 F ASTM-B-33

WEICO NO.	MILITARY NO.	NOM. FLAT WIDTH	NOM. THICKNESS	BRAID CONSTRUCTION AWG. OF INDIV. ENDS	CAR-RIERS	TOTAL NO. OF INDIV. ENDS	APPROX. AWG. EQUIV.	NOM. CIRCULAR MILLS	*CURRENT CARRYING CAP. (Amps)
BF-.025	———	.025"	.015"	36	8	8	27	200	4.0
BF-1/32	———	1/32"	.020"	36	16	16	24	400	6.0
BF-3/64	QQB575F36T031	3/64"	.020"	36	24	24	22	600	7.0
BF-3/32	———	3/32"	.020"	36	16	48	19	1200	11.0
BF-1/8	QQB575F36T078	1/8"	.020"	36	24	72	18	1800	16.0
BF-3/16	QQB575F36T125	3/16"	.020"	36	24	120	15	3000	25.0
BF-1/4	QQB575F36T171	1/4"	.030"	36	24	168	14	4200	32.0
BF-3/8	———	3/8"	.030"	36	48	288	12	7200	46.0
BF-1/2	———	1/2"	.030"	36	48	384	10	9600	53.0
BF-5/8	QQB575F36T375	5/8"	.030"	36	48	384	10	9600	53.0
BF-3/4	———	3/4"	.040"	36	48	832	7	20800	85.0
BF-1	———	1"	.045"	36	48	832	7	20800	85.0
BF-1 3/8	QQB575F30T875	1 3/8"	.050"	30	48	336	5	33700	100.0
BF-1 1/2	QQB575F30T1375	1 1/2"	.060"	30	48	528	3	53064	150.0
BF-1 3/4	———	1 3/4"	080	30	48	1248	2/0	125424	280.0
BF-2	———	2"	.120	30	48	1436	3/0	154368	310.0

DESCRIPTION:
Tinned Copper Strands Woven And Rolled Flat At Time of Manufacture To Specific Width Depending on Construction

APPLICATION:
Used For Bonding, Straps, Grounding or Connecting Moving Parts. Recommended For High Current.

TUBULAR BRAID QQ-B-575 R ASTM-B-33

WEICO NO.	MILITARY NO.	NOM. I.D. WHEN ROUNDED	BRAID CONSTRUCTION AWG. OF INDIV. ENDS	CAR-RIERS	TOTAL NO. OF INDIV. ENDS	APPROX. AWG. EQUIV.	NOM. CIRCULAR MILLS	*CURRENT CARRYING CAP. (AMPS)
BT-1/32	QQB575R36T031	1/32"	36	24	24	22	600	7.0
BT-1/16	QQB575R36T062	1/16"	36	24	48	19	1200	11.0
BT-5/64	QQB575R36T078	5/64"	36	24	72	18	1800	16.0
BT-7/64	QQB575R36T109	7/64"	36	24	96	16	2400	19.0
BT-1/8	QQB575R36T125	1/8"	36	24	120	15	3000	25.5
BT-5/32	QQB575R36T156	5/32"	36	24	240	12	6000	40.0
BT-11/64	QQB575R36T171	11/64"	36	24	168	14	4200	32.0
BT-13/64	QQB575R34T203	13/64"	34	24	192	11	7630	46.0
BT-1/4	QQB575R36T250	1/4"	36	24	384	10	9600	53.0
BT-9/32	QQB575R30T281	9/32"	30	24	120	9	12060	60.0
BT-3/8	QQB575R36T375	3/8"	36	48	384	10	9600	53.0
BT-7/16	QQB575R30T437	7/16"	30	24	240	6	24120	90.0
BT-1/2	QQB575R36T500	1/2"	36	48	528	9	13200	62.0
BT-9/16	QQB575R30T562	9/16"	30	48	480	3	48240	145.0
BT-21/32	QQB575R30T656	21/32"	30	48	768	1	77180	190.0
BT-25/32	QQB575R36T781	25/32"	36	48	864	7	21600	88.0
BT-1	QQB575R30T1000	1"	30	48	384	4	38600	120.0

DESCRIPTION:
Tinned Copper Braid Woven in Completely Round Configuration as Outlined in SPEC QQ-BB-575.

APPLICATION:
Used As Both Shielding and Protective Covering. Shielding is 95% Or More When Placed Over Equivalent Diameter Mandrel To The Inside Diameter of Tubular Braid.

Standard Put-Ups: 100 ft., 500 ft., 1000 ft.

**Values shown are for bare cable in free air at 30°C (86°F) and intended as a reference guide only. Actual values will depend on permissible temperature rise. Permissible voltage drop and other conditions of service.*

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WEICO BUS BAR TINNED COPPER

SOFT DRAWN BUS
MIL-W-3861 TYPE S
QQ-W-343 TYPE S
ASTM-B-33

DESCRIPTION:
Electrolytic, Soft Drawn and Annealed, Solid Tin-Plated Copper.

APPLICATION:
Point to Point Wiring, Component Leads and Ground Wire

Standard Put-Ups: 100 ft., 1000 ft.

WEICO NO.	CONDUCTOR SIZE (AWG)	NOMINAL CIRCULAR MIL AREA	NOMINAL O.D. (INCHES)
9030	30	100.5	.010
9028	28	159.8	.013
9026	26	254.1	.016
9024	24	404.0	.020
9022	22	642.4	.025
9020	20	1022.0	.033
9018	18	1642.0	.040
9016	16	2583.0	.051
9014	14	4107.0	.065
9012	12	6530.0	.082
9010	10	10380.0	.103
9008	8	16510.0	.129

HARD DRAWN BUS
MIL-W-3861 TYPE S

DESCRIPTION:
Electrolytic, Hard Drawn Copper Electro-tinned Plated, Straightened and Cut to 2 Ft. Lengths.

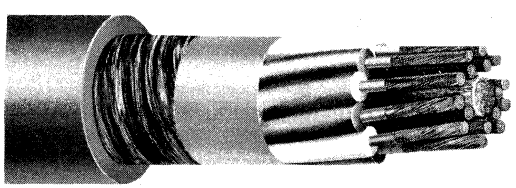
APPLICATION:
For Hooking Up All Types of Transmitters, Especially Ultra Shortwave Equipment Connecting Common Connector Terminals.

WEICO NO.	CONDUCTOR SIZE (AWG)	NOMINAL CIRCULAR MIL AREA	NOMINAL O.D. (INCHES)
W2424	24	404.0	.020
W2222	22	642.4	.025
W2020	20	1022.0	.033
W1818	18	1642.0	.040
W1616	16	2583.0	.051
W1414	14	4107.0	.065
W1212	12	6530.0	.082
W1010	10	10380.0	.103

Standard Put-Ups: 100 Pcs., 2 Ft. Each, Per Package

COMMUNICATION AND CONTROL CABLE

NEOPRENE JACKET
(MULTI-SO)



DESCRIPTION:
Each Conductor Stranded Bare Copper, Color Coded Rubber Insulation, Cabled with Fillers where Necessary, Wrap Over Conductors, Heavy Black Neoprene Jacket Overall.

CHARACTERISTICS:
- Temperature Range: —20°C to +60°C
- Voltage Rating: 600 Volts

18 16/30—STRANDED BARE COPPER—2/64" INSULATION THICKNESS

WEICO NO.	NO. OF CONDUCTORS	NOMINAL JKT. THICKNESS (INCHES)	NOMINAL O.D. (INCHES)
NO-518	5	.078	.485
NO-618	6	.078	.510
NO-818	8	.078	.560
NO-918	9	.078	.595
NO-1018	10	.078	.620

16 26/30—STRANDED BARE COPPER—2/64" INSULATION THICKNESS

NO-516	5	.078	.520
NO-616	6	.078	.540
NO-716	7	.078	.540
NO-816	8	.078	.580
NO-1016	10	.094	.720
NO-1216	12	.094	.745
NO-1416	14	.094	.765
NO-1616	16	.094	.810
NO-2016	20	.094	.890
NO-2216	22	.094	.920
NO-2416	24	.109	1.000
NO-2616	26	.109	1.030
NO-3016	30	.109	1.080

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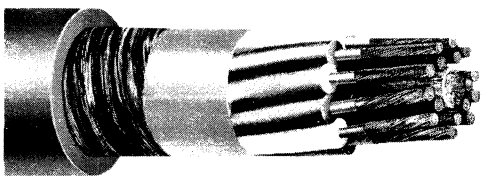
WEICO COMMUNICATION AND CONTROL CABLE

CONTROL CABLE, (MULTI-SO)



COLOR CODE: Per IPCEA

14 41/30—STRANDED BARE COPPER—3/64" INSULATION THICKNESS

WEICO NO.	NO. OF CONDUCTORS	NOM. JACKET THICKNESS (INCHES)	NOM. O.D. (INCHES)
NO-514	5	.095	.675
NO-614	6	.094	.705
NO-714	7	.094	.710
NO-814	8	.094	.760
NO-914	9	.094	.810
NO-1014	10	.094	.870
NO-1214	12	.094	.900

12 65/30—STRANDED BARE COPPER—3/64" INSULATION THICKNESS

NO-512	5	.094	.740
NO-612	6	.094	.790
NO-712	7	.094	.790
NO-812	8	.094	.820
NO-912	9	.109	.900
NO-1012	10	.109	1.010
NO-1212	12	.109	1.040
NO-1612	16	.109	1.160
NO-1812	18	.109	1.220

10 104/30—STRANDED BARE COPPER—3/64" INSULATION THICKNESS

NO-510	5	.094	.800
NO-610	6	.094	.850
NO-810	8	.094	.910
NO-1010	10	.109	1.120

PORTABLE CORDS 300-600V

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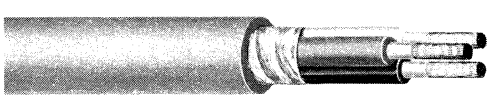

DESCRIPTION:
Each Conductor Stranded Bare Copper, Color Coded Rubber Insulation, Cabled with Fillers, Separator, Black Neoprene Jacket Overall.

CHARACTERISTICS:
- Temperature Range: —30°C to +90°C
- Voltage Rating:
  SJO: 300 Volts
  SO: 600 Volts

NEOPRENE PORTABLE CORD 300 VOLT

WEICO NO.	TYPE	NO. OF COND.	AWG	NOM. INS. THICKNESS (INCHES)	NOM. JKT. THICKNESS (INCHES)	CURRENT CAPACITY IN AMPS	NOM. O.D. (INCHES)
NJO-218	SJO	2	18	.032	.032	7	.305
NJO-318	SJO	3	18	.032	.032	7	.330
NJO-216	SJO	2	16	.032	.032	10	.330
NJO-316	SJO	3	16	.032	.032	10	.360

NEOPRENE PORTABLE CORD 600 VOLT

NO-218	SO	2	18	.030	.060	7	.390
NO-318	SO	3	18	.030	.060	7	.405
NO-418	SO	4	18	.030	.060	6	.435
NO-216	SO	2	16	.030	.060	10	.405
NO-316	SO	3	16	.030	.060	10	.430
NO-416	SO	4	16	.030	.060	8	.485
NO-214	SO	2	14	.045	.075	15	.530
NO-314	SO	3	14	.045	.075	15	.560
NO-414	SO	4	14	.045	.075	12	.605
NO-212	SO	2	12	.045	.090	20	.600
NO-312	SO	3	12	.045	.090	20	.635
NO-412	SO	4	12	.045	.090	16	.665
NO-210	SO	2	10	.045	.090	25	.640
NO-310	SO	3	10	.045	.090	25	.690
NO-410	SO	4	10	.045	.090	20	.745

Standard Put-Ups: 250 ft. **COLORS:** 1 = White 2 = Black 3 = Green 4 = Red

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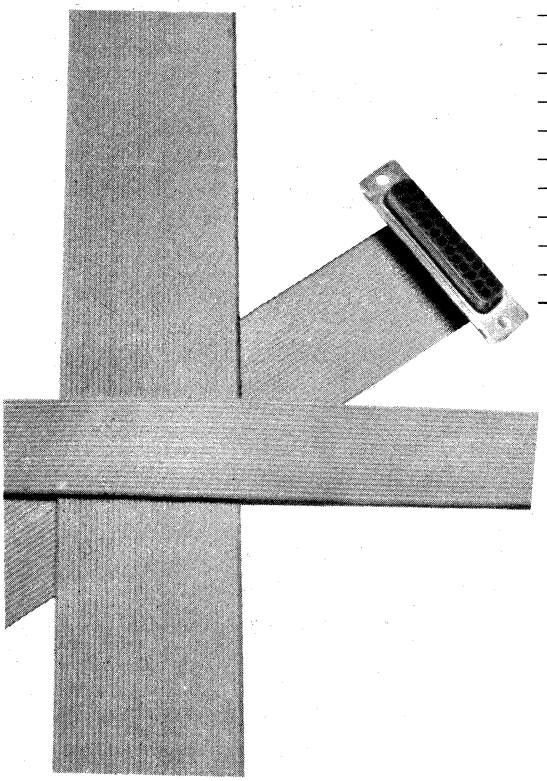
WEICO FLAT CABLE GRAY

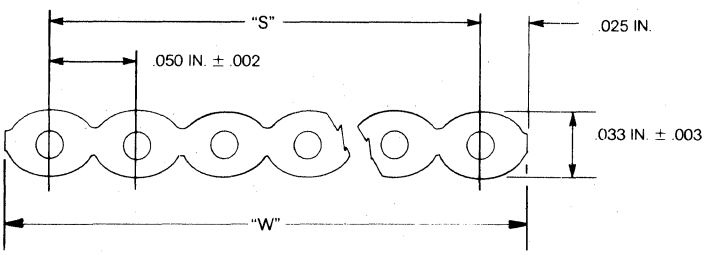
105°C PVC

2651

(PASSES UL VW-1 FLAME TEST)

WEICO NO.	NO. OF CONDUCTORS	NOMINAL OVERALL WIDTH (W) (INCHES)	NOMINAL SPAN (S) (INCHES)
WR-9	9	.45	.40
WR-10	10	.50	.45
WR-14	14	.70	.65
WR-15	15	.75	.70
WR-16	16	.80	.75
WR-20	20	1.00	.95
WR-24	24	1.20	1.15
WR-25	25	1.25	1.20
WR-26	26	1.30	1.25
WR-34	34	1.70	1.65
WR-37	37	1.85	1.80
WR-40	40	2.00	1.95
WR-50	50	2.50	2.45
WR-60	60	3.00	2.95
WR-64	64	3.20	3.15





Weico's gray Flat Cable is designed for general purpose applications. Because of its exacting specifications, it provides consistent reliable performance. Being ribbed on both sides permits reverse plane termination ability on the same cable length. Flexibility and excellent teardown characteristics allow intricate circuit routing and uniform breakouts for harness production. Weico's Flat Cable is stocked in bulk (100 Ft./Reel).

DESCRIPTION:

- 28 AWG (7/36) stranded tinned copper conductor
- Nominal Insulation Thickness: .010" PVC
- Conductors on .050" centers
- Gray PVC with red stripe on leading edge
- UL listed—Style 2651
- Passes UL VW-1

CHARACTERISTICS:

- Temperature Rating: —105°C
- Voltage Rating: 300 Volts
- Capacitance: 14 pF/ft nom.*
- Propagation Delay: 1.4 ns/ft—.18 ns rise time pulse @ 1 mhz*
- Impedance: 105 ohms nom.*
- Crosstalk: nom. between two adjacent signal lines @ 1 ns rise time over 10 ft. length; near end 3.2%—far end 11.5%*
- Environmental: resists acids, alkalis, oil, moisture, solvents, ozone and fungus

Standard Packaging: 100 foot spool

***Transmission Characteristics: Ground-Signal-Ground-Signal Etc. With All Grounds Common**

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

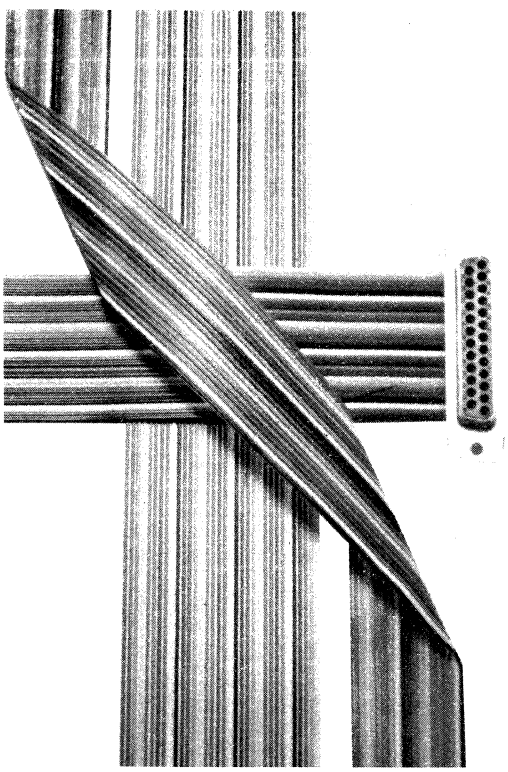
WEICO FLAT CABLE COLOR CODED

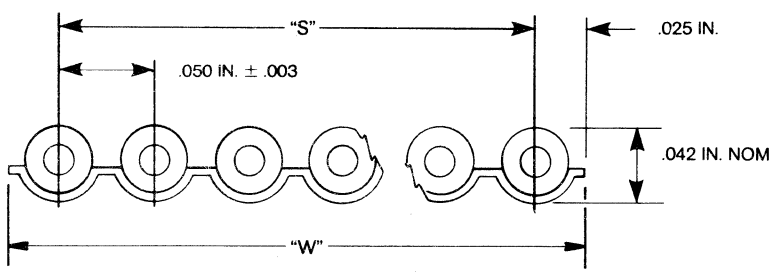
105°C PVC

2884

(PASSES UL VW-1 FLAME TEST)

WEICO NO.	NO. OF CONDUCTORS	NOMINAL OVERALL WIDTH (W) (INCHES)	NOMINAL SPAN (S) (INCHES)
WC-9	9	.45	.40
WC-10	10	.50	.45
WC-14	14	.70	.65
WC-15	15	.75	.70
WC-16	16	.80	.75
WC-20	20	1.00	.95
WC-24	24	1.20	1.15
WC-25	25	1.25	1.20
WC-26	26	1.30	1.25
WC-34	34	1.70	1.65
WC-37	37	1.85	1.80
WC-40	40	2.00	1.95
WC-50	50	2.50	2.45
WC-60	60	3.00	2.95
WC-64	64	3.20	3.15





Weico's color coded Flat Cable is manufactured from pre-insulated color coded conductors which are then laminated on .050 center to center spacing. This permits conventional termination using insulation displacement connectors. Color coding affords immediate identification of discrete wires for positive termination and traceability. Weico's Flat Cable is stocked in bulk (100 ft/reel).

DESCRIPTION:

- 28 AWG (7/36) stranded tinned copper conductor
- 0.10" nom. wall PVC
- Conductors laminated to a sheet of .009" clear PVC
- Color Code: brown, red, orange, yellow, green, blue, violet, gray, white, black. Color code repeats beyond 10 conductors
- UL listed-Style 2884
- Passes UL VW-1

CHARACTERISTICS:

- Temperature Rating: 105°C
- Voltage Rating: 300 Volts
- Capacitance: 14 pF/ft @ 1mhz*
- Propagation Delay: 1.4 ns/ft—.18 ns rise time pulse*
- Impedance: 105 ohms nom.*
- Crosstalk: nom. between two adjacent signal lines @ 1 ns rise time over 10 ft. length; near end 3.2%—far end 11.5%*
- Environmental: resists acids, alkalis, oil, moisture, solvents, ozone and fungus

Standard Packaging: 100 foot spool

***Transmission Characteristics: Ground-Signal-Ground-Signal Etc. With All Grounds Common**

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

WEICO POWER SUPPLY CORDS

3 CONDUCTOR
N.A. COLOR CODING
CEE COLOR CODING

UL LISTED CSA

DESCRIPTION:
- Stranded Bare Copper Conductors
- Color Coded PVC or Rubber Insulation
- PVC (SVT-SJT), Rubber (SV-SJ) Or Neoprene (SJO) Jacket
- One End Fitted With Molded Three Prong Male Plug, Other End Has Jacket and Conductors Stripped Back
- Shielded or Unshielded As Indicated In Table

APPLICATIONS:
Type SV-SVT: Small Tools, Business Machines, Light-Duty Equipment

Type SJ-SJT-SJO: Heavier Duty Tools, Electric Saws, Small Motors, Grinders, Saws, Sanders

NEMA 5-15P

OUTER JACKET STRIPPED 2".
CONDUCTORS STRIPPED AND TWISTED 5/8"

WEICO NO.	LENGTH (FT.)	COLOR CODING	AWG (STRAND-ING)	NOM. OD. (INCHES)	RATING	UL TYPE	COLOR
UNSHIELDED							
30306	6	NA	18(16x30)	0.328	1250 Watts 10A-125V	SJ	Black
30406	6	NA	18(16x30)	0.315	1250 Watts 10A-125V	SJT	Gray
30407/ECC	6'7"	CEE	18(41x34)	0.315	1250 Watts 10A-125V	SJT	Black
30308	8	NA	18(16x30)	0.328	1250 Watts 10A-125V	SJ	Black
30508	8	NA	18(16x30)	0.328	1250 Watts 10A-125V	SJO	Black
30312	12	NA	18(16x30)	0.328	1250 Watts 10A-125V	SJ	Black
30309/16	9	NA	16(26x30)	0.353	1625 Watts 13A-125V	SJ	Black
30312/16	12	NA	16(26x30)	0.353	1625 Watts 13A-125V	SJ	Black
SHIELDED							
33207/ECC	6'7"	CEE	18(41x34)	.270	1250 Watts 10A-125V	SVT Shielded	Black
33410/14ECC	9'10"	CEE	14(41x30)	.402	1875 Watts 15A-125V	SJT Shielded	Black

NEMA 5-15P

OUTER JACKET STRIPPED 1½".
CONDUCTORS STRIPPED AND TWISTED 5/8"

UNSHIELDED							
30106	6	NA	18(41x34)	0.265	1250 Watts 10A-125V	SV	Black
30108	8	NA	18(41x34)	0.246	1250 Watts 10A-125V	SV	Black
30206	6	NA	18(41x34)	0.253	1250 Watts 10A-125V	SVT	Gray
30208	8	NA	18(41x34)	0.253	1250 Watts 10A-125V	SVT	Gray

COLOR CODE COMPARISON BY FUNCTION

Function
N = Neutral
L = Live
E = Earth or Ground

North American Color Coding
White
Black
Green or Green/Yellow

CEE
Light Blue
Brown
Green/Yellow

NEMA 5-15P

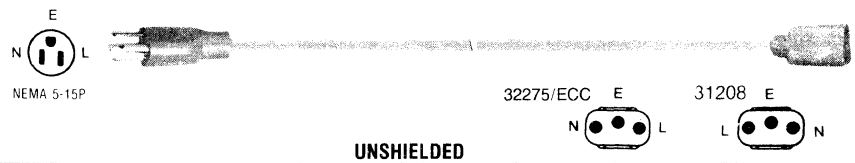
OUTER JACKET STRIPPED 2".
CONDUCTORS STRIPPED AND TWISTED 3/4"

UNSHIELDED							
30309/14	9	NA	14(41x30)	0.380	1875 Watts 15A-125V	SJ	Black
30315/14	15	NA	14(41x30)	0.380	1875 Watts 15A-125V	SJ	Black

WEICO POWER SUPPLY CORDS, WELDING CABLE

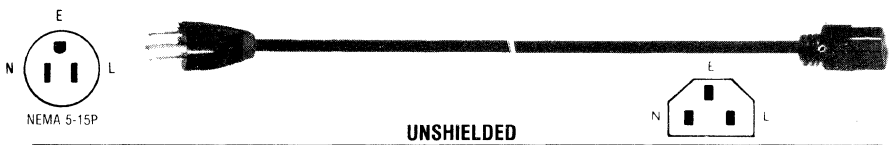
EXTENSION CORDS, DETACHABLE 3 CONDUCTORS N.A. COLOR CODING CEE COLOR CODING

LISTED



UNSHIELDED

WEICO NO.	LENGTH (FT.)	COLOR CODING	AWG (STRAND-ING)	NOM. OD. (INCHES)	RATING	UL TYPE	COLOR
31208	8	NA	18(41x34)	0.253	875 Watts 7A-125V	SVT	Gray
32275/ECC	7½	CEE	18(41x34)	0.246	875 Watts 7A-125V	SVT	Gray



DESCRIPTION:
- One End Fitted With Molded Three Prong Male Plug, Other End Fitted With Molded Female Receptable.
- Shielded or Unshielded As Indicated In Table.

UNSHIELDED

31275	7½	NA	18(41x34)	0.253	1250 Watts 10A-125V	SVT	Black
31275/ECC	7½	CEE	18(41x34)	0.246	1250 Watts 10A-125V	SVT	Black
31407/ECC	6'7"	CEE	18(41x34)	0.315	1250 Watts 10A-125V	SJT	Black
31407/14ECC	6'7"	CEE	14(41x30)	0.380	1875 Watts 15A-125V	SJT	Black
31407/16	6'7"	CEE	16(65x34)	0.340	1625 Watts 13A-125V	SJT	Black
31410	9'10"	CEE	18(41x34)	0.315	1250 Watts 10A-125A	SJT	Black

SHIELDED

34410/14ECC	9'10"	CEE	14(41x30)	0.402	1875 Watts 15A-125V	SJT Shielded	Black

COLOR CODE COMPARISON BY FUNCTION

Function
N = Neutral
L = Live
E = Earth or Ground

North American Color Coding
White
Black
Green or Green/Yellow

CEE
Light Blue
Brown
Green/Yellow

UNSHIELDED

31310	10	NA	18(16x30)	0.328	1250 Watts 10A-125V	SJ	Black
31310/16	10	NA	16(26x30)	0.340	1625 Watts 13A-125V	SJ	Black

WELDING CABLE NEOPRENE

DESCRIPTION:
- Stranded Bare Copper Conductor
- Black Neoprene Jacket
- Temperature Range: —30°C to +90°C

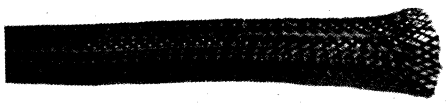
WEICO NO.	CONDUCTOR AWG.	STRAND	NOM. OVERALL DIAMETER (INCHES)	CURRENT CARRYING CAPACITY (AMPS)	APPROX. NET. WT. LBS./M.FT.
1006	6	266/30	.39	75	134
1004	4	420/30	.42	100	187
1003	3	532/30	.45	150	233
1002	2	665/30	.55	200	299
1001	1	833/30	.60	250	365
1010	1/0	1057/30	.66	300	457
1020	2/0	1317/30	.73	375	555
1030	3/0	1622/30	.80	450	698
1040	4/0	2109/30	.87	550	871

Standard Put-Ups: 250 ft., 1000 ft.

WEICO TUBING

EXPANDABLE BRAIDED POLYESTER SLEEVING

(PASSES VW-1 FLAME TEST)



GENERAL PURPOSE WEICO NO.	FLAME RETARDANT WEICO NO.	MINIMUM SUPPLIED I.D. (INCHES)	MAXIMUM EXPANDED I.D. (INCHES)	NOM. WALL THICKNESS (INCHES)
XPT 1/8	XFR 1/8	0.093	0.250	.025
XPT 1/4	XFR 1/4	0.125	0.437	.025
XPT 1/2	XFR 1/2	0.250	0.750	.025
XPT 3/4	XFR 3/4	0.500	1.250	.025
XPT 1-1/4	XFR 1-1/4	0.750	1.750	.025
XPT 1-3/4	XFR 1-3/4	1.250	2.750	.025
XPT 2	XFR 2	1.500	3.500	.025

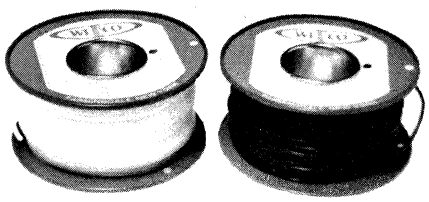
COLOR: Black

DESCRIPTION:
WEICO XPT and XFR are lightweight, expandable sleevings that offer extreme flexibility. The open weave allows for a wide range of sleeving diameters, thus ensuring ease of installation over a wide range of shapes and sizes. This sleeving provides an economical, flexible, protection for bundling wires, harnesses, and cable assemblies on various types of machinery, from industrial robots to CAD/CAM controlled process and machine tool equipment.

CHARACTERISTICS:
- Operating Temperature: —70°C to +125°C
- Applicable Specifications: MIL STD-810B—Method 508
- Fungus inert
- Resists abrasion and cut through, self-extinguishing when used to encase non-flammable wires or cables.

Standard Put-Ups: Consult Factory

TUBING *"TEFLON"



DESCRIPTION:
WEICO'S Teflon Tubing is Rated For Continuous Operation at 260°C While Retaining Exceptional Toughness and Flexibility. The Dielectric Strength of Teflon at High Frequencies is Many Times That of Other Insulators. The Insulation Resistance Properties are Unaffected by Heat Aging or Temperature Use up to 260°C.

SPECIFICATIONS:
ETT: AMS 3654, ASTM D 3295 CLASS A
TT: AMS 3655, ASTM D 3295 CLASS B
TS: AMS 3653, ASTM D 3295 CLASS C
MIL-I-22129 (all three)

CHARACTERISTICS:
- Operating Temperature: —65°C to +260°C
- Dielectric Strength: 550 Volts/MIL
- Fungus Resistant
- Self-Extinguishing
- Non-Corrosive
- Zero Water Absorption

COLORS: Natural = C
0 = Black 2 = Red 4 = Yellow 6 = Blue 8 = Gray
1 = Brown 3 = Orange 5 = Green 7 = Violet 9 = White

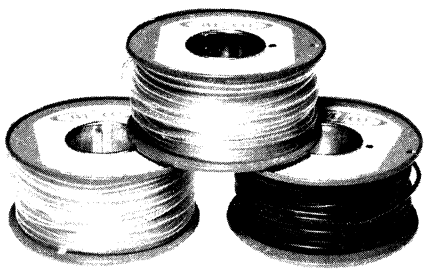
Standard Put-Ups: 100 ft., 1000 ft.

**DuPont's Registered Trademark.*

WEICO NO. AND SIZE EXTRA THIN WALL	THIN WALL	STANDARD WALL	NOM. INSIDE DIA. (INCHES)	ETT WALL THICKNESS (INCHES)	TT WALL THICKNESS (INCHES)	TS WALL THICKNESS (INCHES)
ETT-30	TT-30	—	.012	.006	.009	—
ETT-28	TT-28	—	.015	.006	.009	—
ETT-26	TT-26	—	.018	.006	.009	—
ETT-24	TT-24	TS-24	.022	.006	.010	.012
ETT-22	TT-22	TS-22	.028	.006	.010	.012
ETT-20	TT-20	TS-20	.034	.006	.012	.016
ETT-19	TT-19	TS-19	.038	.006	.012	.016
ETT-18	TT-18	TS-18	.042	.006	.012	.016
ETT-17	TT-17	TS-17	.047	.006	.012	.016
ETT-16	TT-16	TS-16	.053	.006	.012	.016
ETT-15	TT-15	TS-15	.059	.006	.012	.016
ETT-14	TT-14	TS-14	.066	.008	.012	.016
ETT-13	TT-13	TS-13	.076	.008	.012	.016
ETT-12	TT-12	TS-12	.085	.008	.012	.016
ETT-11	TT-11	TS-11	.095	.008	.012	.016
ETT-10	TT-10	TS-10	.106	.008	.012	.016
ETT-9	TT-9	TS-9	.118	.008	.015	.020
ETT-8	TT-8	TS-8	.133	.008	.015	.020
ETT-7	TT-7	TS-7	.148	.008	.015	.020
ETT-6	TT-6	TS-6	.166	.010	.015	.020
ETT-5	TT-5	TS-5	.186	.010	.015	.020
ETT-4	TT-4	TS-4	.208	.010	.015	.020
ETT-3	TT-3	TS-3	.234	.010	.015	.020
ETT-2	TT-2	TS-2	.263	.010	.015	.020
ETT-1	TT-1	TS-1	.294	.010	.015	.020
ETT-0	TT-0	TS-0	.330	.012	.015	.020

WEICO TUBING

PVC
105°C
(PASSES VW-1 FLAME TEST)



DESCRIPTION:
WEICO'S PVC Tubing is an Economical All-Purpose Insulating Material. It is Flexible, Heat and Oil Resistant and has Superior Thermal, Mechanical and Electrical Properties.

SPECIFICATIONS:
- MIL-I-631-TYPE F, FORM U, GRADE C, CLASS 1, CATEGORY 1

CHARACTERISTICS:
- Operating Temperature: —20°C to +105°C
- Dielectric Strength: 800 Volts/MIL
- Non Corrosive
- Self Extinguishing
- Fungus Resistant

WEICO NO.	SIZE	NOM. INSIDE DIA. (INCHES)	NOM. WALL THICKNESS (INCHES)	STANDARD PUT-UPS
PV-24	24	.022	.013	100',—1000' Spools
PV-22	22	.027	.012	100',—1000' Spools
PV-20	20	.034	.016	100',—1000' Spools
PV-19	19	.038	.016	100',—1000' Spools
PV-18	18	.042	.016	100',—1000' Spools
PV-17	17	.047	.016	100',—1000' Spools
PV-16	16	.053	.016	100',—1000' Spools
PV-15	15	.059	.016	100',—1000' Spools
PV-14	14	.066	.016	100',500' Spools
PV-13	13	.076	.016	100',500' Spools
PV-12	12	.085	.016	100',500' Spools
PV-11	11	.095	.016	100',500' Spools
PV-10	10	.106	.016	100',500' Spools
PV-9	9	.118	.020	100',500' Spools
PV-8	8	.133	.020	100',500' Spools
PV-7	7	.148	.020	100',500' Spools
PV-6	6	.166	.020	100',500' Spools
PV-5	5	.186	.020	100',500' Spools
PV-4	4	.208	.020	100',250' Spools
PV-3	3	.234	.020	100',250' Spools
PV-2	2	.263	.020	100',250' Spools
PV-1	1	.294	.020	100',250' Spools
PV-0	0	.330	.020	100',250' Spools
PV-5/16	5/16"	.312	.025	100',250' Coils
PV-3/8	3/8"	.375	.025	100',250' Spools
PV-7/16	7/16"	.438	.025	100' Coils
PV-1/2	1/2"	.500	.025	100' Coils
PV-9/16	9/16"	.562	.030	100' Coils
PV-5/8	5/8"	.625	.030	100' Coils
PV-3/4	3/4"	.750	.035	50' Coils
PV-7/8	7/8"	.875	.035	50' Coils
PV-1 IN	1"	1.000	.035	50' Coils
PV-1-1/8	1-1/8"	1.125	.035	50' Coils
PV-1-1/4	1-1/4"	1.250	.040	50' Coils
PV-1-3/8	1-3/8"	1.375	.045	50' Coils
PV-1-1/2	1-1/2"	1.500	.045	50' Coils
PV-1-3/4	1-3/4"	1.750	.055	50' Coils
PV-2 IN	2"	2.000	.060	50' Coils
PV-2-1/4	2-1/4"	2.250	.070	50' Coils
PV-2-1/2	2-1/2"	2.500	.070	50' Coils

COLORS: C = Clear 9 = White 2 = Red
0 = Black 4 = Yellow 5 = Green

WEICO TUBING

PLASTIC IMPREGNATED FIBERGLASS TUBING

CONFORMS TO:
MIL-I-3190—GRADE B AND MIL-I-21557

THERMAL CLASS B:
(130°C). NEMA Type 3

DIELECTRIC: 4000 VDC

OPERATING TEMPERATURE:
—20°C to +130°C
- Non Corrosive
- Self Extinguishing
- Fungus Resistant

STOCK COLOR: Black

Standard Put-Ups: 100 ft., 1000 ft.

WEICO NO.	SIZE	NOMINAL I.D.	NOM. WALL THICKNESS (INCHES)
FG24	24	.022	.019
FG22	22	.027	.019
FG20	20	.034	.019
FG19	19	.038	.019
FG18	18	.042	.019
FG17	17	.047	.019
FG16	16	.053	.024
FG15	15	.059	.024
FG14	14	.066	.024
FG13	13	.076	.024
FG12	12	.085	.024
FG11	11	.095	.024
FG10	10	.106	.024
FG09	09	.118	.024
FG08	08	.133	.024

WEICO NO.	SIZE	NOMINAL I.D.	NOM. WALL THICKNESS (INCHES)
FG7	7	.148	.024
FG6	6	.166	.024
FG5	5	.186	.031
FG4	4	.206	.031
FG3	3	.234	.031
FG2	2	.263	.031
FG1	1	.294	.036
FG0	0	.330	.036
FG3/8	3/8"	.387	.036
FG7/16	7/16"	.450	.036
FG1/2	1/2"	.512	.036
FG5/8	5/8"	.640	.036
FG3/4	3/4"	.768	.036
FG7/8	7/8"	.893	.036
FG1"	1"	1.018	.036

DESCRIPTION:
The Weico FG Tubing is a Woven Fiberglass Braid Impregnated With a Heat Resistant, Extremely Flexible, Tough Plastic Insulation. It is Formulated to Provide The Optimum in Electrical, Chemical Resistance, Heat Stability, and Abrasion Resistant Properties.

SILICONE RUBBER COATED FIBERGLASS TUBING

DESCRIPTION:
The WEICO RSF Tubing is a Tightly Woven, Fiberglass Braid, Coated With Silicon Rubber. It Offers High Heat and Superior Electrical Characteristics in Any Application Requiring Class H Insulation, and Maintains Exceptional Flexibility Over Its Entire Operating Temperature Range.

THERMAL CLASS H: for 200°C operation. NEMA Type 5.

GRADE A-1: 8000V. Dielectric.

MEETS MILITARY SPECIFICATIONS:
MIL-I-3190 and MIL-I-18057.

OPERATING TEMPERATURE RANGE:
—85°C to +200°C
- Non Corrosive
- Self Extinguishing
- Fungus Resistant

STOCK COLOR: Natural

Standard Put-Ups: 100 ft., 1000 ft.

WEICO NO.	SIZE	NOM. INSIDE DIAMETER (INCHES)	NOM. WALL THICKNESS (INCHES)
RSF-24	24	.024	.020
RSF-22	22	.029	.020
RSF-20	20	.036	.020
RSF-18	18	.045	.020
RSF-17	17	.050	.020
RSF-16	16	.056	.024
RSF-15	15	.062	.024
RSF-14	14	.068	.024
RSF-13	13	.076	.024
RSF-12	12	.085	.024
RSF-11	11	.096	.024
RSF-10	10	.107	.024
RSF-9	9	.119	.024
RSF-8	8	.135	.024
RSF-7	7	.151	.024
RSF-6	6	.170	.024
RSF-5	5	.190	.028
RSF-4	4	.214	.028
RSF-3	3	.239	.028
RSF-2	2	.268	.028
RSF-1	1	.300	.028
RSF-0	0	.336	.028
RSF-3/8	3/8"	.387	.034
RSF-7/16	7/16"	.450	.034
RSF-1/2	1/2"	.512	.034
RSF-5/8	5/8"	.640	.034
RSF-3/4	3/4"	.768	.034
RSF-7/8	7/8"	.893	.034
RSF-1"	1"	1.018	.034

WEICO WIRE & CABLE INC. • 161 Rodeo Drive • Edgewood, N.Y. 11717 • TEL 516-254-2970 • FAX 516-254-2099

TUBING, SHRINKABLE

PVC 105°C

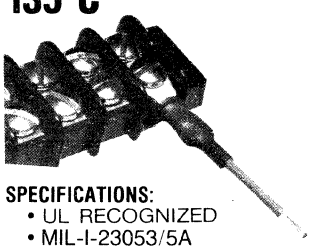
SPECIFICATIONS:
- MIL-I-23053/2
- AMS-3582
- UL RECOGNIZED

CHARACTERISTICS:
Operating Temperature: —35°C to +105°C
Shrinkage Ratio: to 50% of Supplied Diameter at 175° C
Longitudinal Shrinkage: 10% Nominal
Dielectric Strength: 750 Volts/MIL

WEICO NO.	MILITARY NO.	SIZE (INCHES)	MIN. I.D. BEFORE SHRINKAGE (INCHES)	RECOVERED I.D. AFTER SHRINKAGE (INCHES)	NOM. WALL THICKNESS (INCHES)	STANDARD PUT-UP (FEET)
SPV-1/16	M23053/2-202-X	1/16	.062	.031	.020	100, 500
SPV-3/32	M23053/2-203-X	3/32	.093	.046	.020	100, 200
SPV-1/8	M23053/2-204-X	1/8	.125	.062	.020	100, 200
SPV-3/16	M23053/2-205-X	3/16	.187	.093	.020	100, 200
SPV-1/4	M23053/2-206-X	1/4	.250	.125	.025	100, 200
SPV-3/8	M23053/2-207-X	3/8	.375	.187	.025	100, 200
SPV-1/2	M23053/2-208-X	1/2	.500	.250	.025	100
SPV-3/4	M23053/2-209-X	3/4	.775	.375	.030	100
SPV-1	M23053/2-210-X	1	1.000	.500	.035	100
SPV-1 1/2	M23053/2-211-X	1 1/2	1.500	.750	.045	100
SPV-2	M23053/2-212-X	2	2.000	1.000	.050	50

COLORS: 0 = Black C = Clear **X Denotes color coding**

POLYOLEFIN 135°C



SPECIFICATIONS:
- UL RECOGNIZED
- MIL-I-23053/5A
- AMS-3636B (Colors) Nonflammable
- AMS-3637B (Clear) Flammable

CHARACTERISTICS:
Operating Temperature: —55°C to +135°C
Shrinkage Ratio: to 50% of Supplied Diameter at 121° C
Longitudinal Shrinkage: 5% Nominal
Dielectric Strength: 1300 Volts/MIL

WEICO'S Polyolefin tubings offer an outstanding balance of properties—electrical, physical and chemical—that make them the most popular choice for a wide variety of industrial and military applications.

Rated for 135°C continuous operation and engineered for superior flame resistance properties, Polyolefin tubings are typically used as a shrink-fit electrical insulation over cable splices and terminations. Polyolefin tubings are also excellent for light-weight wire harness covering, wire marking and bundling, component packaging and fire resistant covering. Polyolefin clear tubings provide excellent visibility for component packaging. All Polyolefin tubings are split-resistant, mechanically tough, easily marked and they resist cold flow.

COLORS: 0 = Black 4 = Yellow 9 = White
2 = Red 6 = Blue C = Clear

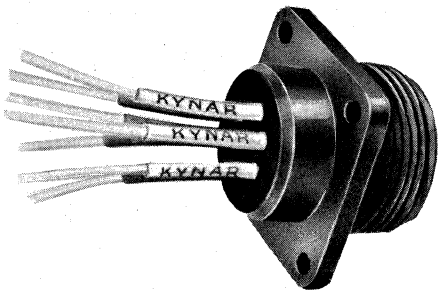
Also available UL & CSA printed—please specify when ordering.

WEICO NO.	MILITARY NO. (CLEAR)	MILITARY NO. (COLORS)	SIZE (INCHES)	MIN. I.D. BEFORE SHRINKING (INCHES)	RECOVERED I.D. AFTER SHRINKING (INCHES)	RECOVERED NOM. WALL THICKNESS (INCHES)
SPO-3/64	M23053/5-201-C	M23053/5-101-X	3/64	.046	.023	.016
SPO-1/16	M23053/5-202-C	M23053/5-102-X	1/16	.063	.031	.017
SPO-3/32	M23053/5-203-C	M23053/5-103-X	3/32	.093	.046	.020
SPO-1/8	M23053/5-204-C	M23053/5-104-X	1/8	.125	.062	.020
SPO-3/16	M23053/5-205-C	M23053/5-105-X	3/16	.187	.093	.020
SPO-1/4	M23053/5-206-C	M23053/5-106-X	1/4	.250	.125	.025
SPO-3/8	M23053/5-207-C	M23053/5-107-X	3/8	.375	.187	.025
SPO-1/2	M23053/5-208-C	M23053/5-108-X	1/2	.500	.250	.025
SPO-3/4	M23053/5-209-C	M23053/5-109-X	3/4	.750	.375	.030
SPO-1	M23053/5-210-C	M23053/5-110-X	1	1.000	.500	.035
SPO-1 1/2	M23053/5-211-C	M23053/5-111-X	1 1/2	1.500	.750	.040
SPO-2	M23053/5-212-C	M23053/5-112-X	2	2.000	1.000	.045
SPO-3	M23053/5-213-C	M23053/5-113-X	3	3.000	1.500	.050
SPO-4	M23053/5-214-C	M23053/5-114-X	4	4.000	2.000	.055

Standard Put-Ups: 4 ft. lengths, 100 ft./pkg. Spools—100 ft and 1000 ft./spool
X Denotes color coding

WEICO TUBING, SHRINKABLE

KYNAR* TUBING



WEICO'S Kynar is an irradiated, thin-wall, heat-shrinkable tubing offering a high degree of mechanical strength and high-temperature resistance. Kynar is fabricated from polyvinylidene fluoride, hence, their outstanding abrasion resistance and cut-through properties in combination with high dielectric strength. Kynar is inherently flame-retardant and semi-rigid. It is highly resistant to most industrial fuels, chemicals and solvents.

Kynar tubings are recommended for shrink-fit protection and strain relief of wires, solder joints, terminals and connections. Suggested applications include automotive wiring, jackets, fuse coverings and military wire markers. Because the tubing is transparent, it affords see-thru inspection and identification when used as a jacketing for components such as resistors and capacitors. Kynar tubings are readily marked by hot-stamp and print-wheel equipment.

Kynar tubings are rated for continuous operation from —55°C (—67°F) to +175°C (+347°F). The tubings will withstand higher operating temperatures for short time intervals.

Minimum shrink temperature for Kynar tubings is +175°C (+347°F).

Kynar tubings meet the requirements of MIL-I-23053/8, AMS 3632, and are U.L. recognized for 600 volts @ 150°C; U.L. VW-1 rated.

CHARACTERISTICS:
- High Mechanical Strength
- High Temperature

COLOR: Clear

WEICO NO.	MILITARY NO.	SIZE (INCHES)	EXPANDED I.D. MINIMUM (INCHES)	RECOVERED I.D. MAXIMUM (INCHES)	RECOVERED NOM. WALL THICKNESS (INCHES)
SKY-3/64	M23053/8-001-C	3/64	.046	.023	.010
SKY-1/16	M23053/8-002-C	1/16	.063	.031	.010
SKY-3/32	M23053/8-003-C	3/32	.093	.046	.010
SKY-⅛	M23053/8-004-C	⅛	.125	.062	.010
SKY-3/16	M23053/8-005-C	3/16	.187	.093	.010
SKY-¼	M23053/8-006-C	¼	.250	.125	.012
SKY-⅜	M23053/8-007-C	⅜	.375	.187	.012
SKY-½	M23053/8-008-C	½	.500	.250	.012
SKY-¾	M23053/8-009-C	¾	.750	.375	.017
SKY-1	M23053/8-010-C	1	1.000	.500	.019
SKY-1½	M23053/8-011-C	1½	1.500	.750	.020

Standard Put-Ups: 4 ft. Lengths

**Pennwalt Chemical Registered Trademark*

TUBING, SHRINKABLE

NEOPRENE TUBING

NEOPRENE very flexible, self-extinguishing, modified polychloroprene tubings combining a high degree of mechanical toughness and oil-resistance with 121°C continuous operating temperature.

WEICO'S Neoprene heat-shrinkable tubings are recommended for applications requiring a tough, highly flexible covering. Neoprene tubings are thick-walled, and provide superior cut-through and abrasion resistance. The tubings are unaffected by common fluids and solvents. Resistance to oils is excellent.

Neoprene tubings maintain flexibility at low temperatures. The tubings are particularly useful for the fabrication and repair of flexible harnesses and wire bundles and for covering of hydraulic couplings. The superior mechanical properties of Neoprene tubings make them ideal choices for the jacketing of cable harnesses and custom-made cables that must operate in severe environmental conditions.

Neoprene tubings are rated for continuous operation from —70°C (—94°F) to +121°C (+250°F). The tubings will withstand higher operating temperatures for short time intervals.

WEICO NO.	MILITARY NO.	SIZE (INCHES)	EXPANDED I.D. MINIMUM (INCHES)	RECOVERED I.D. MAXIMUM (INCHES)	RECOVERED NOM. WALL THICKNESS (INCHES)
SNE-⅛	—	⅛	.125	.072	.030
SNE-3/16	—	3/16	.187	.106	.035
SNE-¼	M23053/1-201-0	¼	.250	.125	.035
SNE-⅜	M23053/1-202-0	⅜	.375	.187	.040
SNE-½	M23053/1-203-0	½	.500	.250	.048
SNE-⅝	M23053/1-204-0	⅝	.625	.312	.052
SNE-¾	M23053/1-205-0	¾	.750	.375	.057
SNE-⅞	M23053/1-206-0	⅞	.875	.437	.065
SNE-1	M23053/1-207-0	1	1.000	.500	.070
SNE-1¼	M23053/1-208-0	1¼	1.250	.612	.087
SNE-1½	M23053/1-209-0	1½	1.500	.750	.095
SNE-1¾	M23053/1-210-0	1¾	1.750	.875	.107
SNE-2	M23053/1-211-0	2	2.000	1.000	.110
SNE-3	M23053/1-212-0	3	3.000	1.500	.125

COLOR: Black **Standard Put-Ups: Spools**

Minimum shrinkage temperature for neoprene tubings is +135°C (+275°F)

Neoprene tubings can be readily marked by hot-stamp and print-wheel methods.

Neoprene tubings are self-extinguishing and meet the requirements of MIL-I-23053/1 Class 1 & 2; MIL-R-46846, Type 1, Class 1 and AMS 3623.

IRRADIATED POLYOLEFIN MULTIPLE WALL, INNER WALL MELTS

WEICO'S SMW Tubings are rated for continuous operation at temperatures from —55° to+ 110°C and will withstand higher operating temperatures for brief time intervals.

WEICO'S SMW Tubings meet the requirements of AMS 3634 and MIL-I-23053/4, Class 1.

WEICO'S SMW is a semi-rigid, 110°C heat-shrinkable polyolefin tubing that is co-extruded and selectively cross-linked to provide an integral, meltable inner wall.

On the application of heat in excess of 135°C WEICO'S SMW Tubing automatically shrinks and closely conforms to the contours of the underlying substrate. The inner meltable wall of the tubing is simultaneously softened and forced by the shrink action into intimate contact with all underlying surfaces, interstices and small voids. Upon cooling, the installed SMW Tubing represents a tough protective and insulating barrier, highly resistant to penetration by moisture and the attack of chemicals and solvents.

WEICO NO.	MILITARY NO.	EXPANDED I.D. MINIMUM (INCHES)	RECOVERED I.D. MAXIMUM (INCHES)	RECOVERED NOM. WALL THICKNESS TOTAL WALL (INCHES)	MELTABLE WALL NOM. (INCHES)
SMW-⅛	M23053/4-101-0	.125	.023	.038	.020
SMW-3/16	M23053/4-102-0	.187	.060	.043	.025
SMW-¼	M23053/4-103-0	.250	.080	.047	.027
SMW-300	—	.300	.050	.100	.065
SMW-⅜	M23053/4-104-0	.375	.135	.050	.030
SMW-½	M23053/4-105-0	.500	.195	.055	.035
SMW-¾	M23053/4-106-0	.750	.313	.065	.040
SMW-1"	M23053/4-107-0	1.00	.400	.075	.040

COLOR: Black **Standard Put-Ups: 4 ft. Lengths**

NOMOGRAPH VOLTAGE DROP

NOMOGRAPH OF VOLTAGE DROP ACROSS LOAD SUPPLY LEADS (as a function of wire size and load current)

THIS NOMOGRAPH CAN BE USED TO FIND:

Maximum current carrying capacity recommended for any standard wire size.*

1) With a straight edge, connect from the wire size on Scale 2 to the point "A" on Scale 3.
2) Read I_{max} on Scale 1.

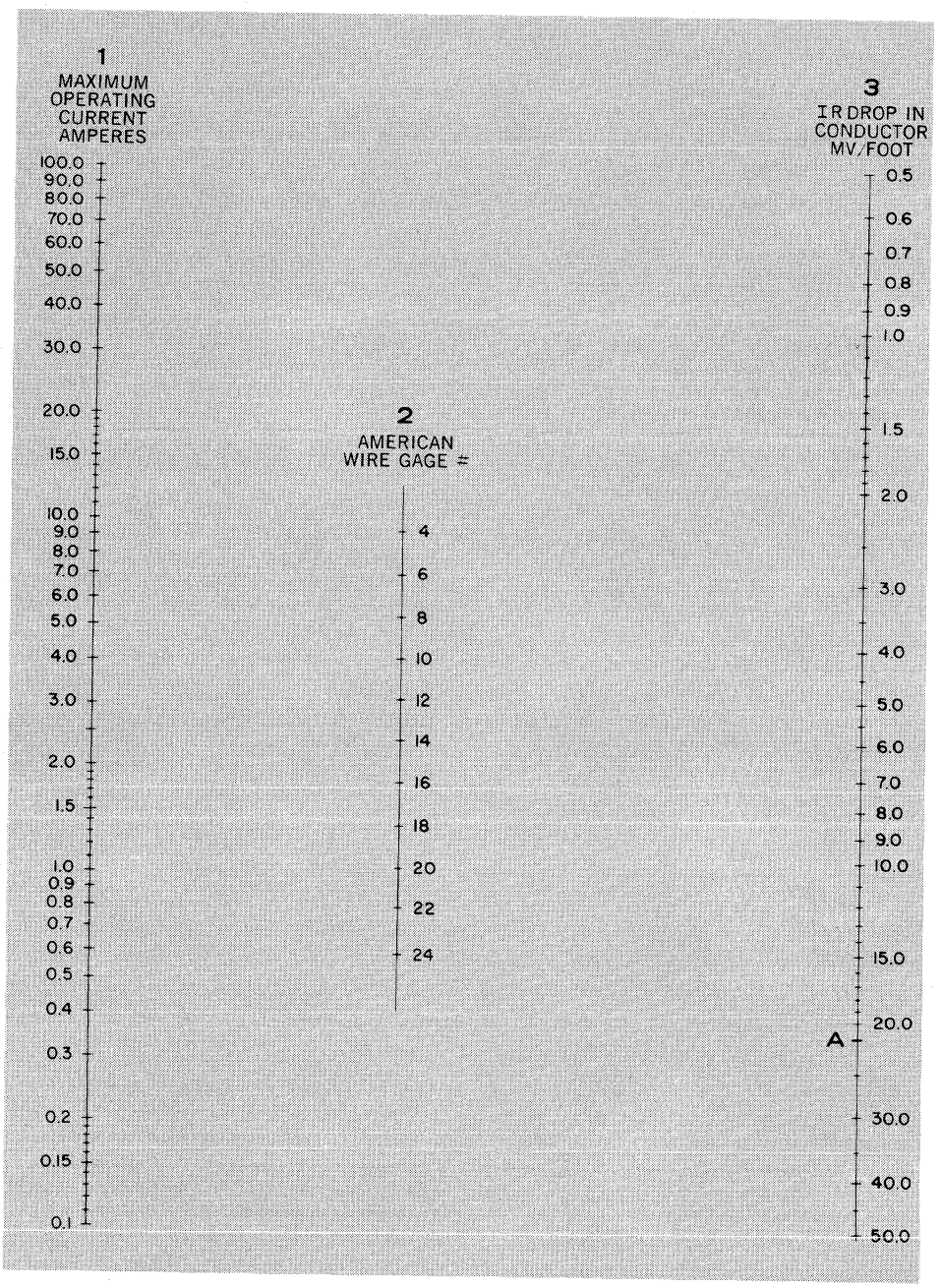
Voltage drop in millivolts per foot for known wire size and operating current.

1) With a straight edge, connect the known current on Scale 1 and the wire size on Scale 2.
2) Read voltage drop on Scale 3.

Wire size required for known operating current and known maximum tolerable voltage drop across supply leads.

1) Determine maximum tolerable drop in millivolts **per foot** of lead (sum of positive and negative leads).
2) Connect the value on Scale 3 (as determined in step 1) to the known current on Scale 1.
3) Read wire size on Scale 2.

* *Based on an arbitrary minimum 500 circular mils per ampere. High-temperature class insulation will safely allow higher currents.*



NOTE: A voltage stabilized Power Supply controls the voltage across its output terminals. Hence, the wire conductors used to connect the load must be considered as part of the load. At high load currents, the voltage drop across the supply leads may appreciably degrade stablization at the load. Kepco models equipped with the *remote error sensing* feature can automatically compensate for voltage drops of up to 500 mV across each load supply lead.

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